State Capacity, Property Rights, and External Revenues: Haiti, 1932-1949

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Abstract

External revenues blunt investments in fiscal capacity. But how do external revenues affect investments in legal capacity? In a simple model of state capacity investment, external revenues should be positively correlated with investments in legal capacity. But this implication could flip if fiscal capacity lowers the cost of legal capacity investments. I test the model by looking at Haiti in 1942 when U.S. mobilization caused a negative shock to external revenues. Contrary to the basic model, the shock led to an increase in legal capacity. This puzzle is explained by institutions that tied fiscal and legal capacity investments.

A growing consensus among economic historians and development economists is the positive role of state capacity in economic development (Besley and Persson 2009, Johnson and Koyama 2017, Dincecco 2015). Given its importance, we need to understand why developing countries do not invest in state capacity. We know that countries invest less in fiscal capacity (the component of state capacity that enables the government to collect internal tax revenues) when they have access to external revenues through international trade (Frankema and Booth 2019, Gardner 2019) or international credit (Queralt 2019). But we do not understand how these external revenues affect investments in legal capacity, the component of state capacity that enables the government to enforce property rights and the rule of law.

One example of a country where external revenues have hampered state capacity is Haiti. Historically, the government of Haiti depended on customs for almost all of its revenue. This dependence prevented the government from developing the fiscal capacity to tax internal sources of revenue, such as income or property (Lundahl 1979 pp. 400–01; Bulmer-Thomas 2012 p. 191). But its dependence might also have inhibited Haiti's legal capacity. The government of Haiti does not provide clear or complete rights to its many propertyholders (Lundahl 1980, Palsson 2021), and obtaining clear title to land is a burdensome process (de Soto 2000 p. 21). Its low legal capacity, I argue, was also influenced by its reliance on external revenues.

To develop testable implications of the effect of external revenues on legal capacity, I use a simple model of a state investing in capacity. In the model, the state uses internal and external tax revenues to provide public goods and invest in fiscal and legal capacity. Consistent with the literature, the state does not invest in fiscal capacity if it can get sufficient funds from external revenues. In contrast, its access to external revenues does increase legal capacity. The state's reasoning in both is intuitive: it prefers funding public goods from external revenues over internal taxes because internal taxes decrease private consumption; but when the state invests external revenues in legal capacity, it increases both private consumption and the public good. Yet, empirically, states where external revenues impeded the development of fiscal capacity also tend to be states with low legal capacity. This outcome could be explained by endogenous cost shifting: low fiscal capacity might increase the cost of investing in legal capacity. For example, if the state cannot afford to hire surveyors, then it cannot register properties. In this case, external revenues might decrease investments in legal capacity through their impact on fiscal capacity.

I can test the models' implications in Haiti during the 1930s and 1940s. Through the 1930s, Haiti relied on customs revenues for over 80% of government revenues. But in 1942, the government

of Haiti faced a budget crisis when the United States, Haiti's largest trading partner, entered World War II. Consistent with the model, the government responded to the revenue shock by focusing on internal revenues. In 1942, it reformed income taxes and increased tax rates on almost every level of income. As a result, by 1944, the government collected five times more income tax revenue than the pre-war period. While growth in income tax revenues by itself is usually an indicator of higher fiscal capacity, I can gain greater insight by decomposing the growth in revenues. I show that the tax reform explains at most 40% of the change, while economic growth explains another 40%. That means I cannot account for 20% of the change. I argue that this unexplained portion comes from an increase in fiscal capacity.

To investigate how mobilization affected legal capacity, I look at Haiti's public land rental program. I collect data on public lands leased to farmers between 1930 to 1949, and I proxy for legal capacity using the average processing time between request and approval. To show that legal capacity was below the optimal level, I use a demand shock caused by refugees fleeing the Trujillo massacre in 1937. Before the massacre, the average processing time was below 10 months. But after the refugees came in 1937 and just before U.S. mobilization in 1942, the average delay was between 30 to 40 months. This increase illustrates that legal capacity had dropped.

The land rental program shows the government improved legal capacity. After U.S. mobilization, it surveyed and approved properties quicker: the probability that properties would be approved in less than than eight months jumped from 15% to 80%. The government was also less likely to lease properties with incomplete demarcation. Moreover, it reduced delays while request volume remained high. All of these improvements suggest the government improved legal capacity after the shock to external revenues.

The results suggest the baseline model is incomplete. There are two institutional reasons why this is the case in Haiti. First, the model assumes the revenues from internal taxes and external taxes are fungible. But Haitian institutions did not treat the two the same. Its appropriations law did not allocate any customs revenues to expenditures on fiscal or legal capacity—all expenses had to come from internal revenues. When the drop in external revenues triggered an increase in fiscal capacity, the government could use the extra internal revenues to improve legal capacity. A second institutional reason Haiti deviates from the baseline model is that the same administration ran tax collections and the land rental program, creating a complementarity between expansions in fiscal and legal capacity as outlined in the augmented model.

We can see evidence for these complementarities by examining state rental revenues. After

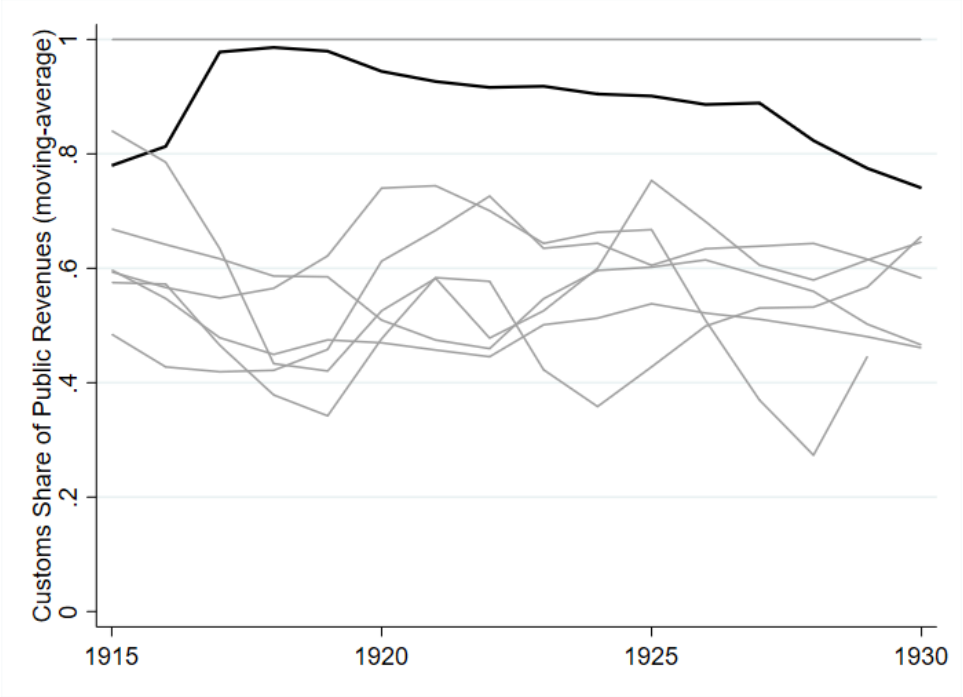
mobilization, the state collected more rent from areas with more rental properties. While this result seems obvious, if the state had not provided sufficient property protections, tenants could have left the properties and squatted somewhere else. The state could only collect more rental revenue if the rental property was better than the outside option of no legal protection. Thus, by increasing legal capacity, it increased internal revenues.

This paper furthers the work on state capacity by exploring the relationship between fiscal and legal capacity. The most influential model of state capacity investments is Besley and Persson (2009), which concludes that investments in fiscal and legal capacity are complements. Not only does this paper add external revenues to their model, it posits another way fiscal and legal capacity are complements. Besley and Persson show complementarity in demand: higher legal capacity makes the economy more productive, so demand for fiscal capacity is higher because a marginal increase in taxation has a much larger return in collections. In contrast, I argue that fiscal and legal capacity are complements in *production*. The complementarity in production comes because higher fiscal capacity decreases the cost of improving legal capacity and vice versa.

This paper provides new empirical evidence on impediments to improving legal capacity. We know a lot about the effects of legal capacity and property rights protections—property rights security affects investment in the asset (Hornbeck 2010, Galiani and Schargrodsky 2010, Libecap and Lueck 2011) and whether the asset itself and other resources are employed in their most productive use (Chari et al. 2020, Field 2007, Agyei-Holmes et al. 2020, Palsson 2021). With so much evidence that improving property rights can bring large economic benefits, we need a better understanding of why states do not invest in legal capacity. The argument here is that low legal capacity comes from low fiscal capacity. While this study focuses on Haiti, many countries in Latin America and the Caribbean have low legal capacity, and it has been established that these countries also have lower fiscal capacity because of their access to customs revenue (Centeno 1997). Thus, Haiti's example might serve as a broader lesson for the region.

Another unique contribution from this paper is the growth of state capacity without a direct military conflict. Many accounts of building state capacity show the power of conflict to motivate investments (Besley and Persson 2010, Arias 2013, Gennaioli and Voth 2015). Indeed, one argument is that state capacity does not cause economic development, but development leads to increases in state capacity because richer states are more likely to be plundered (Geloso and Salter 2020). But with Haiti, there was no direct or implicit threat that inspired a coalition to shift their preferences towards building capacity. While a global military conflict caused the initial shock, the investments

Figure 1. Haiti's dependence on customs revenues relative to other Latin American countries, 1915–1930



Source: Arroyo Abad and Maurer (2017)
Notes: The figure displays a three-year moving average for Haiti (black) and other Latin American countries. Comparison countries are Colombia, Costa Rica, Cuba, Dominican Republic, Honduras, Nicaragua, and Venezuela.

in state capacity came from a drop in external revenues.

1 Haiti's State Capacity Before World War II

By the early 20th century, the Haitian government had become dependent on external revenues. Trade taxes supplied about 90% of the government's revenues, which was much higher than the Latin American average (see Figure 1). In fact, a 1927 study of 34 countries' budgets found Haiti was the most reliant on customs (Haiti Bureau du representant fiscal 1927 pp. 64-65). Its dependence far exceeded the next two countries in the study: Salvador (66%) and the Dominican Republic (50%). Addressing this dependence became one of the main focuses of the US Occupation of Haiti of 1915 to 1934.

Before the US Occupation started, Haiti was plagued by coups and revolutions that hurt its capacity. Revolutionaries would periodically rise up against the government, oust the president, and redistribute rents (Schmidt 1971 p. 42). Constant political turmoil blocked at least one source

of internal revenue by deterring foreign investors from doing business in Haiti (Palsson 2022a). But another way revolutionaries hurt capacity was by staffing government positions with unqualified political allies. As a result, government offices like the tax administration were incompetent. This incompetence was politically convenient because the main targets of an income tax would have been the allies supporting the revolutionaries. But since an income tax was politically unviable and technically unachievable, public revenues had to come from external taxes (Lundahl 1979 pp. 400–01).

When the marines landed in 1915, the Occupation began reforming the government's capacity. But the early reforms were disappointing. One of the Occupation's first acts was to take control of Haiti's customs receivership, though this reform did not improve customs collections as they had hoped (Abad and Maurer 2021). Marines were used in some bureaucratic functions, leading some American officials in later years to complain that the marines were being used as "a glorified bill-collecting agency" (Schmidt 1971 p. 89). But fiscal reform really began in 1921 when American officials established its Fiscal Representative and gave him custody of Haiti's internal revenues. This additional fiscal power came because America restructured Haiti's debt and became the number one holder of Haitian bonds. Controlling Haiti's revenue ensured Americans got paid. Soon after this reform, the Occupation removed incompetent employees and implemented accounting and auditing procedures to eliminate graft (Schmidt 1971 pp. 159-160).

In the process of reforming fiscal capacity, the American officials noticed a tight link between fiscal and legal capacity. For example, in the early years of the Great Depression, the fiscal authority wrote:

> The country in the present crisis cannot afford to accumulate further losses. Tax law violators must be apprehended and brought to justice promptly. The failure of the legal machinery to work promptly during the past year has had a most dangerous and demoralizing effect. The impression has been circulated that laws will not be enforced; and that taxes can be evaded with impunity. These ideas can, and must, be corrected if taxes are to be collected. (Haiti Bureau du representant fiscal 1931 p. 46)

Poor legal capacity was impeding the advancement of fiscal capacity. In that same year, the fiscal authority discussed proposals for land reform. "The chief objection to these projects at that time was that their provisions were too ambitious for the finances of the country adequately to meet the necessary costs of survey, a land office, new courts and other expenses incidental to their enactment" (Haiti Bureau du representant fiscal 1931 pp. 22-23). Low fiscal capacity blocked investments in

legal capacity.

While we believe Haiti's reliance on external revenues inhibited its fiscal capacity, we have not yet seen how it affected Haiti's legal capacity.

2 Model of External Revenue and Investments in State Capacity

Although there is little empirical understanding of how external revenues affect legal capacity, the theoretical argument is easy to establish in a simple model. The model uses Besley and Persson (2009) as a starting point. Since the Besley and Persson model includes several mechanisms that are not relevant to this paper, I distill the model into its fundamental pieces then incorporate external revenues. There are two main results. First, external revenues discourage investments in fiscal capacity, a result that is accepted in the literature (Frankema and Booth 2019, Gardner 2019). Second, investments in legal capacity are increasing in external revenues. But both of these results are questioned when we consider investment complementarities.

Besley and Persson (2009) operationalize legal capacity and fiscal capacity as constraints on how much the government can protect property and tax income. For property protection, the citizen keeps his property with probability p, which the government chooses subject to the legal capacity constraint (π), such that $p \in [0, \pi]$. For example, the government can increase p by issuing land titles, but it can only issue and protect titles if it has a property registry and dispute resolution system. Thus, if the government wants to increase p beyond its current capacity, it has to increase π by investing in "legal infrastructure such as building court systems, employing judges, and registering property" (Besley and Persson 2009). On the other hand, the government taxes property and income at a rate t subject to the fiscal capacity constraint (τ), such that $t \leq \tau$. The tax rate t reflects both the official tax rate and the government's ability to collect the tax revenue. For example, if the government had a 10% tax on income in the formal sector, but if only 50% of income is earned in the formal sector, then t is actually 5%. Thus, if the government wants to raise t, it can adjust tax rates or it can improve tax compliance. But, as with legal capacity, if the government wants to increase taxation beyond its current capacity, it must increase τ through "the build-up of institutions such as an administration (like the IRS in the United States) for the collection of income taxes, a system for the monitoring of tax compliance, etc" (Besley and Persson 2009).

With those definitions of legal and fiscal capacity, I start with a simple model to develop some intuition about their relationship to external revenues. Suppose there is a representative citizen

that receives an endowment (Y). Since property rights are uncertain, the citizen keeps only pY.[1] He also faces an income tax, thus his disposable income is $(1-t)pY$. His utility[2] comes from private consumption (c) and a public good (G):

$$u = \alpha \ln(G) + \ln(c). \tag{1}$$

The government wants to maximize the citizen's utility through its choice of the public good, private consumption, taxation, and property protection. Having the government maximize the citizen's utility corresponds to the utilitarian case described by Besley and Persson (2009). In contrast, the government might instead choose to weight citizens of some groups more than others. For example, one ethnic group might be in charge and prioritizes the utility of co-ethnic citizens, or the elite control the government and put more weight on the elite. Besley and Persson call this the "political control" case. Below I will highlight how the political control case affects the predictions.

The government funds the public good from internal and external (trade) tax revenues. Internal revenues are the taxes on the citizen's endowment ($T = tpY$). I assume that external revenues can be modeled as an exogenous lump sum ($M \geq 0$). This assumption is clearly not a literal corollary to the real world since governments can change tariffs on imports and exports. The assumption, however, reflects that most of the variation in external revenues comes not from variation in tariff rates that the government controls but from variation in prices and (in the case of exports) crop yields, which are both outside the government's control. For example, in Haiti from 1935 to 1948, prices and crop yields explain 72% of the variation in tariff revenues from coffee (Haiti's largest export), and fiscal authorities acknowledged this, "The size and value of the coffee crop is always the greatest variable to be taken into account in [forecasting tariff revenues]" (Haiti Bureau du representant fiscal 1940, p. 4). Likewise, in the U.S., tariff policy is stable over time (except for two major shifts at the Civil War and Great Depression) and most of the variation in tariff revenue comes from changes in prices (Irwin 2017 pp. 6–7). Thus, the model emphasizes the government's response to the exogenous portion of external revenues.

[1] One way to think of Y is the citizen's income under full effort, with legal capacity determining how much effort he exerts. The $(1-\pi)Y$ would then represent the output that was lost because the insecure property rights reduced the citizen's incentive to invest effort. This framing is similar to a Besley and Ghatak (2010) interpretation.

[2] Note that I assume a log-linear utility function. This is a departure from the Besley and Persson model, where they assume a linear utility function. The problem with a linear utility function is that private consumption and the public good become perfect substitutes and the marginal utility of both is constant. Thus, if the marginal utility of the public good is higher than that of private consumption, then the government wants to expand state capacity until it can tax 100% of income and provide the public good. The conclusion is that states do not invest in capacity because the citizens prefer private consumption. I assume a log-linear utility function to allow for a trade-off between private consumption and the public good.

The government's objective function is

$$\max_{G,c,t,p} \alpha \ln(G) + \ln(c) \tag{2}$$

subject to

$$c = (1-t)pY \tag{3}$$

$$G = tpY + M \tag{4}$$

$$t \leq \tau \tag{5}$$

$$p \leq \pi \tag{6}$$

Suppose the fiscal and legal capacity constraints (Equations 5 and 6) do not bind; i.e. there is enough capacity to achieve whatever level of taxation and property protection needed. Then we can substitute the other constraints into the utility function and reduce the government's problem to choosing the tax rate and level of property protection

$$\max_{\tau,\pi} \alpha \ln(tpY + M) + \ln((1-t)pY). \tag{7}$$

From this formulation, when choosing t and p is unconstrained, it is obvious that the government wants to choose $\bar{p} = 1$, where the bar indicates the optimal solution when the government can costlessly choose. Full property protection means property rights are complete, citizens get the most from their endowment, and the government gets the most tax revenue. Besley and Persson (2009) show that even in the political control case, the government wants to provide full property protection to all groups since "choosing less than full property-rights protection would mean throwing away resources that could be taxed to provide public goods or redistributive transfers" (p. 1227). The government then selects t to equalize the marginal utilities of the public good and private consumption. This result is altered slightly by the political control case, which allows the government to transfer revenues from the nonruling group to the ruling group. But even in this case, the government is equalizing weighted marginal utilities.

This simple formulation already provides the result that external revenues reduce fiscal capacity.

First, observe that for $M \geq \alpha pY$, the government chooses $\bar{t} = 0$. Intuitively, this is because the government can fully fund the public good from external revenues and therefore will not decrease the citizen's private consumption. Indeed, if the government could, it would set $\bar{t} < 0$ and transfer funds directly to the citizen. Second, suppose $M < \alpha pY$. Then the total differential of the first-order condition reveals $\partial\bar{\tau}/\partial M < 0$, which means as the external revenues increase, the government chooses a lower level of fiscal capacity.

2.1 Baseline Model – Investing in Capacity

Now suppose the government has initial levels of fiscal and legal capacity, $\tau_0 < \bar{t}$ and $\pi_0 < 1$, and that $M < \alpha\pi Y$. It can invest in higher levels of capacity, $\pi_1 \leq \bar{p} = 1$ and $\tau_1 \leq \bar{t}$, at cost $L(\pi_1 - \pi_0)$ and $F(\tau_1 - \tau_0)$, where $L', F' > 0$ and $L'', F'' > 0$. The optimization function is then

$$\max_{G,c,\pi_1,\tau_1} \alpha \ln(G) + \ln(c) \tag{8}$$

subject to

$$c = (1 - \tau_1)\pi_1 Y \tag{9}$$

$$G + L(\pi_1 - \pi_0) + F(\tau_1 - \tau_0) = \tau_1\pi_1 Y + M. \tag{10}$$

Using (9) and (10), we can simplify (8) to

$$\max_{\pi_1,\tau_1} \alpha \ln(\tau_1\pi_1 Y + M - L(\pi_1 - \pi_0) - F(\tau_1 - \tau_0)) + \ln((1 - \tau_1)\pi_1 Y). \tag{11}$$

The first-order conditions for π_1 and τ_1 are

$$\frac{\alpha\tau_1^* Y - L'(\pi_1^* - \pi_0)}{\tau_1^*\pi_1^* Y + M - L(\pi_1^* - \pi_0) - F(\tau_1^* - \tau_0)} + \frac{1}{\pi_1^*} = 0 \tag{12}$$

$$\frac{\alpha\tau_1^* Y - F'(\tau_1^* - \tau_0)}{\tau_1^*\pi_1^* Y + M - L(\pi_1^* - \pi_0) - F(\tau_1^* - \tau_0)} - \frac{1}{1 - \tau_1^*} = 0. \tag{13}$$

The first-order condition for π_1, (12), shows the government always wants to invest in legal capacity. Suppose there was a condition where the government did not want to invest in legal

capacity, such that $\pi_1 = \pi_0 < 1$. Then, from (12), the following identity must hold:

$$\frac{\alpha\tau_1^* Y}{\tau_1^*\pi_0 Y + M - F(\tau_1^* - \tau_0)} + \frac{1}{\pi_0} = 0. \tag{14}$$

But since both terms are non-negative (the denominator in the first term is positive since this is just G^*), then this is a contradiction. Thus, the government always wants to invest in legal capacity. Intuitively, this is because increasing legal capacity carries two benefits: increasing both the public good and private consumption in the second period.

In the Appendix I show that these first-order conditions yield

$$\frac{\partial\tau_1^*}{\partial M} < 0, \tag{15}$$

$$\frac{\partial\pi_1^*}{\partial M} > 0. \tag{16}$$

The first statement says that when $M < \alpha\pi Y$, an increase in M will decrease investments in fiscal capacity. Fiscal capacity brings the benefit of more public goods, but at the costs of less private consumption. But M provides a source of revenue for investments that do not decrease private consumption. So the government does not need more fiscal capacity. But the second statement says that more M causes the government to increase legal capacity because it is a way to transfer higher customs revenue to higher private consumption. Note that this prediction still holds under the political control case because the government always wants to increase legal capacity.

Thus, the model gives two testable predictions from a change in customs revenue. First, a significant drop in customs revenue should cause the government to invest in fiscal capacity. Second, the drop should cause the government to decrease investments in legal capacity. Yet, a casual assessment suggests that the prediction for legal capacity might not hold. While countries that depend on external revenues have low fiscal capacity, they often also have low legal capacity. If external revenues do not increase legal capacity, the model assumptions need to be reassessed.

2.2 Complements in Production

The above model follows the assumption in Besley and Persson (2009) that the cost of investing in fiscal and legal capacity depends only on how much capacity changes. But there is an argument that fiscal and legal capacity might complement each other, such that investing in one might decrease the cost of investing in the other. For example, registering property titles (legal capacity)

makes it easier to collect property taxes (fiscal capacity). In France (Johnson and Koyama 2014), consolidating the tax regime (fiscal capacity) led to an increase in judges upholding the law (legal capacity). The discussion about Haiti above demonstrates this principle too. The government could not improve tax collection (fiscal capacity) without better law enforcement (legal capacity), and it could not improve property registration (legal capacity) because it did not have the revenue to pay for the project (fiscal capacity). This complementarity might require new assumptions that could alter the model's predictions.

To look at investment complementarities, I modify the cost functions. The cost of increasing one aspect of capacity depends not just on the size of the change but also on the level of the other aspect of state capacity. For example, if the government wants to increase revenues from property taxes, it has to register and protect properties. Or there could be a more explicit cost-shifting if the government uses the same office to both register properties and collect revenues. So the cost of investing in fiscal capacity is $F(\tau_1 - \tau_0, \pi_1)$ with $F_\pi < 0, F_{\pi\pi} > 0, F_{\pi\tau} < 0$. Similary, the cost of investing in legal capacity is $L(\pi_1 - \pi_0, \tau_1)$ with $L_\tau < 0, L_{\tau\tau} > 0, L_{\pi\tau} < 0$. Adding these cost functions to the government's optimization problem means the government seeks to maximize

$$\max_{\pi_1,\tau_1} \left(\alpha \ln(\tau_1\pi_1 Y + M - L(\pi_1 - \pi_0, \tau_1) - F(\tau_1 - \tau_0, \pi_1)) + \ln((1-\tau_1)\pi_1 Y)\right). \tag{17}$$

In Appendix A.4, I show that the complementarities imply that we do not know the signs of $\frac{\partial \pi_1^*}{\partial M}$ or $\frac{\partial \tau_1^*}{\partial M}$ without further knowledge about the cost functions. Thus, complementarities could reverse the relationship between legal capacity and external revenues, such that more external revenues could lead to lower legal capacity.

The intuition is simple to grasp if we walk through a change in external revenues. When external revenues increase, the government wants to decrease fiscal capacity. But a decrease in fiscal capacity raises the cost of investing in legal capacity, which pushes the government to decrease investments in legal capacity. If the government cannot collect sufficient tax revenue, it cannot pay surveyors or judges who settle property disputes. This introduces a tension. The government wants to decrease fiscal capacity to increase private consumption. But the lower fiscal capacity discourages investments in legal capacity, and lower legal capacity results in lower private consumption. Thus, the government must balance these trade-offs between the savings from decreasing capacity investments with the loss to private consumption. But we can only understand these trade-offs with knowledge of the cost functions.

The two models produce testable predictions. If investments in fiscal and legal capacity are

independent of each other, then a drop in external revenues should cause the state to increase investments in fiscal capacity and decrease investments in legal capacity. But if the drop in external revenues causes the government to increase both fiscal and legal capacity, then there is evidence that the investments in capacity are complementary.

3 Haiti and the Response to World War II

To test the model's predictions, I use an external revenue shock caused by U.S. mobilization in World War II. This shock had immediate effects on fiscal policy, and, as I will show, the shock caused a change in legal capacity too.

3.1 Fiscal Capacity Before and After Mobilization

While the Haitian government focused on improving internal revenues under the US Occupation, its focus became sharper when there were external revenue shocks. When coffee revenues dropped in 1929, the government increased tax collections (Schmidt 1971 p. 196). Then, in response to the Great Depression, it again increased internal tax collections (Schmidt 1971 p. 221) and modified several internal taxes, including a gasoline tax, a stamp tax, and income taxes.[3] The government did not respond to subsequent fluctuations in the 1930s with large reforms, though that might be because the earlier reforms anticipated a period of greater variation. But at the close of 1941, when the U.S. mobilized in response to Pearl Harbor, the Haitian government faced a budget crisis.

As America's entrance into the war restructured Haiti's trade, customs revenues fell precipitously. Customs receipts in 1941-42 were lower than at any point in the previous 20 years, including every year of the Depression (Banque nationale de la Republique d'Haiti 1942 p. 62). The fall came because the war diverted high-tariff imports like cars and cement. Unlike previous revenue shortfalls in the decade, customs remained persistently low for years (see Table 1). Anticipating a sustained shock, President Élie Lescot's administration rushed to find new sources of revenue. "Before many weeks of war had passed, it became evident that new methods would have to be devised and special arrangements made in order to enable the country to ride out the storm" (Banque nationale de la Republique d'Haiti 1942 p 2). The administration appealed to the U.S. for help, received a line of credit from the Export-Import Bank, and passed a special tax on the country's largest export, coffee (Banque nationale de la Republique d'Haiti 1942 p. 2-3, 7). But its efforts were insufficient.

[3] *Le Moniteur*, 29 September 1932

Table 1. Export Value and Taxes Collected by Haitian Government, 1932-1948

	Export Value	External Revenues	Internal Revenues	Income Tax
Pre-Reform				
1932	40,118	25,596	4,368	487
1933	54,056	35,770	5,784	706
1934	60,929	35,795	5,968	623
1935	41,720	28,281	5,292	615
1936	54,422	33,178	5,409	535
1937	51,262	32,777	5,674	539
1938	39,468	25,585	5,671	541
1939	41,293	29,041	5,707	450
1940	30,676	24,038	5,961	533
1941	34,035	21,905	4,626	482
Reform Partially Implemented				
1942	36,561	16,493	4,550	543
Reform Fully Implemented				
1943	36,178	15,177	5,908	1,868
1944	47,350	18,182	6,166	2,177
1945	48,340	17,126	5,960	2,618
1946	57,781	16,465	5,508	2,210
1947	70,974	23,378	5,378	2,183
1948	68,970	25,604	8,086	4,220

Source: Annual Reports of the Fiscal Representative. Notes: Figures are in thousands of gourdes and are adjusted for inflation (constant 1930 Gourdes). The income tax is part of internal revenues, and total tax revenues is the sum of external and internal revenues.

Table 2. Haitian Income Tax Schedule, 1932 and 1942

Bracket	1932 Rate	1942 Rate	Factor Increase
Personal Income			
Less than 5,000	3%	3%	1.0
5,001–10,000	3%	4%	1.3
10,000–12,500	3%	5%	1.7
12,501–15,000	4%	5%	1.3
15,001–25,000	4%	8%	2.0
25,001–30,000	5%	8%	1.6
30,001–75,000	5%	12%	2.4
75,001–100,000	6%	12%	2.0
More than 100,000	6%	15%	2.5
Business Income			
Less than 5,000	5%	3%	0.6
5,000–10,000	5%	4%	0.8
10,001–15,000	5%	5%	1.0
15,001–30,000	5%	8%	1.6
30,001–50,000	5%	12%	2.4
50,001–100,000	6%	12%	2.0
More than 100,000	6%	15%	2.5

Sources: Rates from 1932 come from *Le Moniteur*, 29 September 1932. Rates from 1942 come from *Le Moniteur*, 25 May 1942.
Notes: Figures are in gourdes, unadjusted for inflation.

Their next step was unsurprising given the baseline model: the drop in customs stimulated an expansion of fiscal capacity. Despite the drop in trade taxes, the economy as a whole was performing well. GDP estimates are unvailable for this period, but Table 1 shows export revenues over 40% higher in 1945 than they were in 1941. This strong economic performance meant increasing internal revenues was a shrewd policy for a desperate government. In 1942, the government, in partnership with the U.S. fiscal representative,[4] resorted to reforming the income tax. It increased rates for almost all brackets (the median rate increase was 70%, see Table 2) and changed the top tax rate from 6% to 15%. Under the old law, the government treated business income (from *sociétés anonymes*) differently than personal income, but with the reform it treated the two sources the same. If the government could enforce the law, the reform should significantly increase internal revenues.

To collect more revenue, the Haitian Internal Revenue Service (HIRS) had to overcome two barriers. First, it needed more personnel. From 1926 to 1931, HIRS employed 80-90 rural agents responsible for collecting communal taxes. By 1933, the number of employees had jumped to 151, but the HIRS administrators had little confidence in the new hires. "Due to the fact that there are many districts in which receipts are so sparse that it is not possible to pay local agents adequate salaries for their collection, the Internal Revenue Service is still considerably handicapped in getting honest and efficient local officers. The turnover is consequently very large among these local agents," (Haiti Bureau du representant fiscal 1933 pp. 128-129). Moreover, only a fraction of the agents worked in the regions outside of the western population center: the three regions bordering the Dominican Republic in the East employed 36 agents total in 1933, and only 17 in 1931. After 1933, HIRS did not report personnel data, but its nominal expenditures on wages and salaries soared after the reform (see Figure 8 below). Specifically, in the first year of the reform, "the staff of traveling inspectors was considerably increased" (Banque nationale de la Republique d'Haiti 1943, p. 12). In a rural country with few major population centers, traveling inspectors were crucial to collecting taxes.

Second, HIRS needed more physical capital. To help the newly hired traveling inspectors, HIRS purchased new automobiles (Banque nationale de la Republique d'Haiti 1943, p. 12). Prior to the reform, HIRS did not have much physical infrastructure. "The Internal Revenue Service maintains agencies throughout the Republic, and many of these agencies in the past have been poorly housed

[4]While the military occupation ended in 1934, the U.S. still maintained control of fiscal policy through its fiscal representative. The representative remained to make sure the Haitian debts were paid to American bondholders. See Schmidt (1971) for more details.

or completely lacking in Government owned quarters" (Banque nationale de la Republique d'Haiti 1944 p. 11). This changed with the reform. "A program of construction of internal revenue offices was undertaken in the course of the year" (*idem.*). Furthermore, HIRS had historically struggled to track who owed taxes, but with the new budget "the Internal Revenue Service also undertook the construction of an archives building," (Banque nationale de la Republique d'Haiti 1943, p. 12) which was completed the next year (Banque nationale de la Republique d'Haiti 1944, p. 11).

These investments contributed to increasing tax revenues not just in the year the reform passed but in the subsequent years as well. Before the reform, income tax revenues averaged 551,000 gourdes per year (see Table 1).[5] But in 1943, the first year the reform was fully implemented, these revenues jumped to 1,868,000 gourdes, more than three times the pre-reform average. By 1948, revenues had increased seven-fold to 4,220,000. The reform had transformed the role of the income tax. Before the reform, income tax revenues were about 10% of all internal taxes. After the reform, the income tax became the most important source of internal revenue, comprising 50% of total internal taxes by 1948. The substantial growth in income taxes suggests the reform did more than just increase tax rates; it collected taxes more efficiently. But since tax revenues can grow for multiple reasons, below I decompose the growth to find how much fiscal capacity contributed.

3.2 Legal Capacity in Haiti Before U.S. Mobilization

Like with all countries, measuring legal capacity in Haiti is difficult, but I approach this challenge by looking at the government's land rental program. This government program leased public land to farmers and residents. It let tenants choose the property, cultivate their own crops, keep all income generated from the land, and have exclusive access to it. Thus, the program reflects the government's legal capacity because the leases granted the tenant property rights. Protecting property rights on the rented properties was not a public good: only one person could hold the title, and that person could prevent others from using the property. Since the program provided exclusive rights, the tenants paid rent on the lease. It did not, however, give tenants alienation rights, so the tenant could not sell the property or use it as collateral. Even though the property rights were incomplete, the rental program gave the tenant a set of property rights that required legal capacity to protect.

Enforcing property rights sometimes stretched the state's legal capacity. The demands on capacity can be seen in a 1928 report that listed some of the cases that came before the state (Haiti

[5] All revenues and expenditures are adjusted for inflation using the Bulmer-Thomas (2012) index for public revenues and expenditures and are expressed in constant 1930 gourdes.

Table 3. Fraction of Land Rents Recovered by District, 1930-1932

	1930	1931	1932	Average (1930-32)
Leogane-Nippes	0.72	0.84	0.68	0.75
Cayes	0.79	0.55	0.76	0.70
Fort Liberte	0.79	0.67	0.63	0.70
Port-au-Prince	0.64	0.60	0.75	0.66
Port-de-Paix	0.56	0.54	0.78	0.63
Jacmel	0.63	0.46	0.45	0.51
Cap Haitien	0.65	0.32	0.44	0.47
Jeremie	0.52	0.33	0.23	0.36
St Marc	0.36	0.35	0.37	0.36
Gonaives	0.22	0.31	0.31	0.28
Total	0.55	0.45	0.52	0.51

Sources: Recovery rates come from the Annual Reports of the Fiscal Representative.

Bureau du representant fiscal 1928, pp. 73-75):

> One of several cases submitted to the district cadastral commission at Cap-Haitien during the year involved the habitation Canal in the commune of Terrier-Rouge. A claim to the entire habitation was presented. It was found that one part of the property had been occupied by tenants of the State, and another portion by the claimant and his ancestors; and search by a surveyor resulted in the finding of the original boundary stones marking the privately owned portion. The claimant accepted the decision of the district cadastral commission rejecting his claim to the state-owned portion and admitting his ownership of the remainder. Another claim submitted to this commission involved the habitation Cheneau, in the same commune, and was based on an old deed which was found to have been forged in every essential particular.

The example exhibits the legal capacity needed to establish a claim: adjudicating competing claims, physically searching the property for the original boundary, convincing the claimants to accept the decision, and investigating fraudulent titles.

One sign of insufficient legal capacity is recovery rates for rent. From 1930 to 1932, the average recovery rate for all land rental revenue was 51% (see Table 3). But rates varied significantly across the 10 administrative regions. Average recovery rates in three regions were at or above 70%, while they were less than 40% in three other regions. These rates could be low for a few reasons. First, the rental program might not have had the capacity to collect the revenues. A second reason could be that the program's administrators did not know who rented which plots or how much they owed. A program with insufficient capacity to track rents does not have the capacity to enforce claims.

Finally, it might not have had sufficient capacity to evict tenants who do not pay rent. But, if the program did not have the capacity to remove tenants, it could not enforce property rights.

3.3 The Trujillo Massacre and Legal Capacity

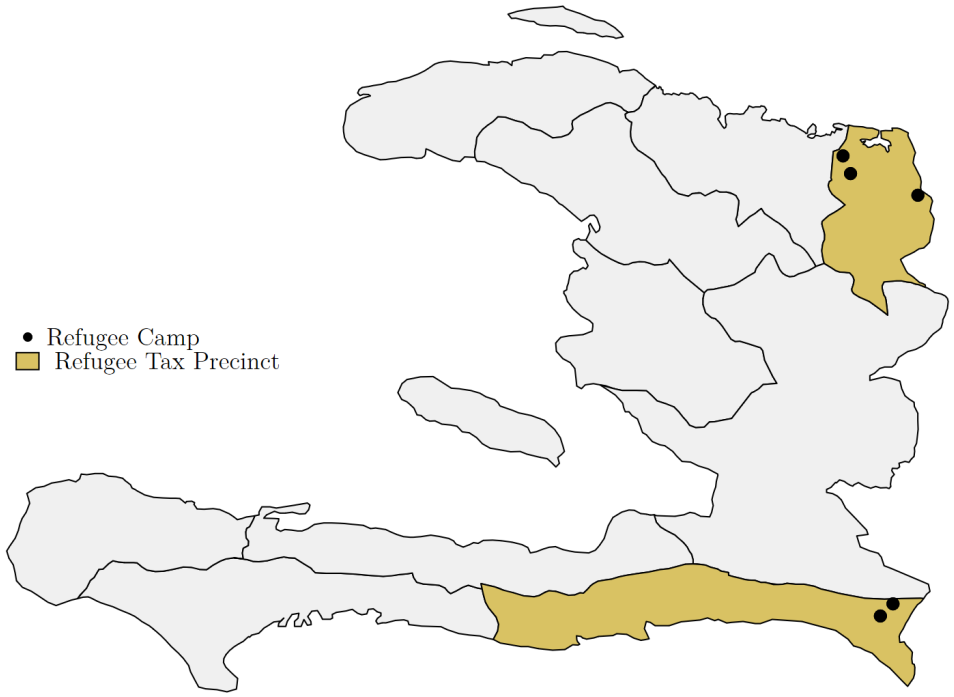
Although there is evidence that Haiti's legal capacity was low, that does not mean it was not optimal. In the model, the optimal level of legal capacity is $\pi = 1$. But it is unclear what $\pi = 1$ means in the real world. For example, while it seems that optimal protection would include always respecting property rights, there are many examples where economic development came from violating rights (Lamoreaux 2011). To test the model, we need to know legal capacity is below the optimal level. While we might not know what is optimal, we can observe whether it has dropped from a former level.

To show legal capacity was below Haiti's optimum before U.S. mobilization, I use a demand shock to the land rental program caused by the Trujillo Massacre. In October 1937, President Rafael Trujillo of the Dominican Republic ordered the Dominican army to massacre ethnic Haitians living in his country. The massacre was focused along the border in the North-Western region of the Dominican Republic, but the entire country felt its effects. From the 1936 to 1950 census, the Dominican Republic lost at least 30,000 Haitians (Palsson 2022b), of which about 12,000 died in the massacre (Vega 1995). The survivors flooded into Haiti. Many of the refugees were repatriated Haitians, but a significant portion were Dominicans of Haitian descent who had never been to Haiti. While the magnitude of the refugee shock is unknown, Palsson (2022b) suggests that it increased the population of districts near the refugee camps by 8%.

Despite the large refugee population movements, Haiti's government did little to support them or to confront the Dominican Republic. Led by President Lescot's predecessor President Stenio Vincent, the government started refugee camps near the border in the North and South (see Figure 2). The government intended to use the camps to coordinate aid, but it failed to provide the promised services (Pierre-Charles 1965 pp. 111–112). Not only did Vincent's administration provide inadequate support to the refugees, it also avoided confronting Trujillo. Vincent did not strengthen border security or threaten the Dominican Republic (Smith 2009, pp 31-32). Even when Vincent got Trujillo to agree to pay a meager $750,000 indemnity (about $14 million in 2020), he later settled for $525,000 ($10 million in 2020), of which little went to the refugees (Heinl et al. 1996 p. 482).[6] In fact, President Vincent went out of his way to avoid conflict with Trujillo by appealing

[6]Heinl et al. (1996) calculates that the payments valued a life between $17.50 and $30.00, or roughly the price of a pig (p. 482).

Figure 2. Location of Refugee Camps and Tax Precincts



Notes: The map represents the 10 tax precincts during this period. The two colored precincts contain the refugee camps and are the treated precincts in the synthetic control analysis in Section 4.3.

to the U.S. for mediation (Roorda 1996). There is a compelling case that his administration did not respond because he was protecting rents for him and the elite, but this view is incomplete without also understanding state capacity.[7]

Although the government failed to adequately provide aid through its refugee camps, the camps were not the only form of aid the refugees relied on. The refugees also applied for properties under the rental program (Palsson 2021). This demand for property will help test the state's legal capacity.

4 Data on tax revenues and property requests

To empirically examine the model's prediction, I collected data on properties requested in the land rental program and tax revenue collections.

4.1 Property requests

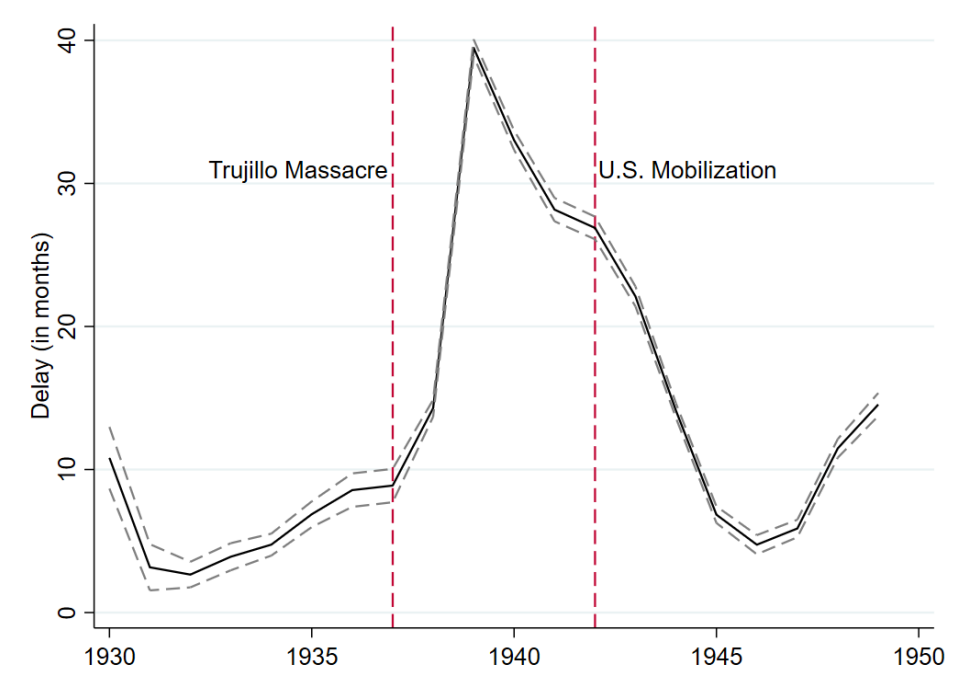
The data come from public land rental notifications published in the government's gazette, *Le Moniteur*. By law, the program had to publish a notification in *Le Moniteur* once it approved a lease in case there were competing claims. From 1930 to 1949, it published 8,554 notifications. Each notification contains key descriptive information about the requested land, such as the district (*commune*) where it was located, when it was requested and when it was approved.

The details in the notifications allow me to calculate a proxy for legal capacity. Since the notification gives the date the property was requested and the date it was approved, I calculate the processing delay for each property, which is a common measure of effective property rights systems (de Soto 2000). Looking at delays over time shows that prospective tenants had to wait significantly longer once the refugees arrived (see Figure 3). Before the massacre, the average delay was below 10 months. But after the refugees came in 1937, there was an unambiguous increase. Delays peaked at 40 months for requests in 1939. Then they decreased steadily until they returned to the pre-massacre levels in 1945.

The trends in Figure 3 suggest that capacity was strained and relieved, but it is hard to tell the

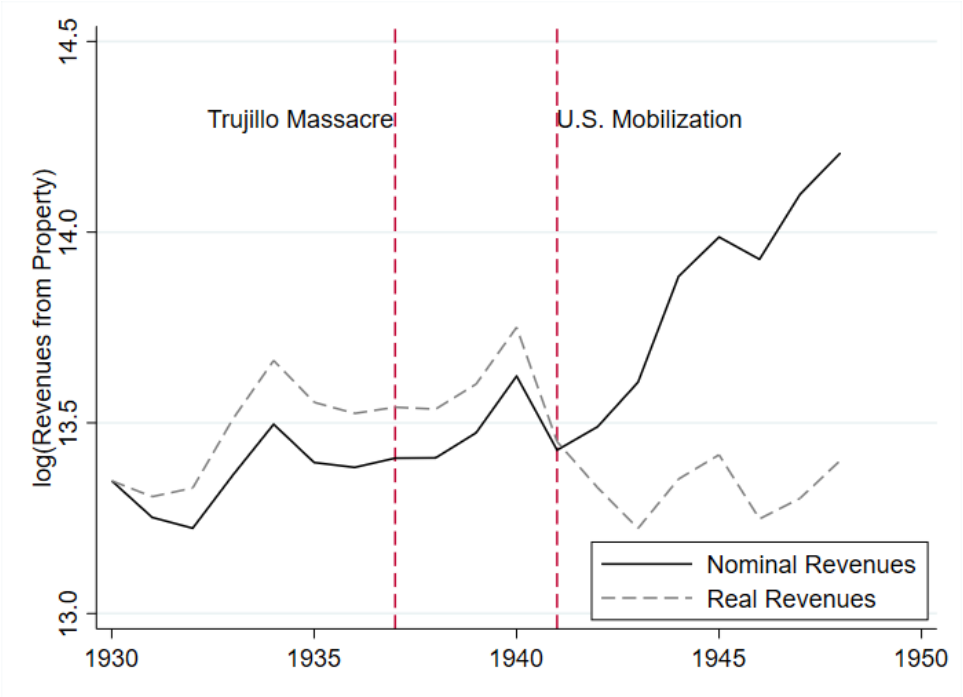
[7]The case for protecting rents centers on Vincent's plan to seek reelection. An aggressive response could have plunged his country into disastrous conflict, threatening his political prospects and future rents (Smith 2009 p. 32). Vincent seemed more concerned with the threat to the elite's rents in Port-au-Prince, allocating more soldiers to protect the capital rather than the border. His reluctance might have also had a racial element, since the political elite were light-skinned *mulatre* and the victims were dark-skinned *noirs* (Heinl et al. 1996 pp. 482-483). But the focus on rent extraction ignores the government's capacity constraints. Sometimes state capacity is recognized as a barrier to creating a credible military threat against the Dominican Republic (Heinl et al. 1996 pp. 482; Smith 2009 pp. 31-32), but if capacity constrained the military response then it likely also constrained the humanitarian response.

Figure 3. Average delay between request and approval, 1930-1949



Notes: Delays are calculated from notifications in *Le Moniteur*. Confidence intervals come from a pooled regression with delays as the dependent variable and year-dummies as the only explanatory variable.

Figure 4. Revenues from all property rentals and fees, 1930-1948



Notes: Data come from the Annual Reports of the Fiscal Representative. Includes revenues from property transfer fees and public land rentals.

timing of the improvements in capacity. The peak in 1939 seems to indicate that the investments in capacity happened quickly. But a 40-month delay from 1939 means the properties were approved in the middle of 1942, which means the improvement in capacity coincided with U.S. mobilization.

4.2 Fiscal Revenues

I also collect data on fiscal outcomes from the Fiscal Department's Annual Reports. From 1932 to 1949, the reports contained consistent and detailed information on tax collections across the country's 10 precincts (shown in Figure 2). They also include data on HIRS budgets and personnel expenditures.

The Annual Reports report data on property-related tax revenues. Although Haiti did not have a land tax, the government received revenue from public land rentals and fees for registering mortgages and property transfers. The revenue trends are displayed in Figure 4. Nominal receipts increased gradually through the 1930s, but there was a clear break in trend after U.S. mobilization. When the revenues are adjusted for inflation, they are much lower in the post-mobilization period. But this was by design: by law, the government fixed rent on its leases for 10 years. Nominal rents

could only increase if fees increased or if the government improved rental recovery rates, reevaluated rental properties at their 10-year mark, or leased more land. Since these last three are functions of legal capacity, this is additional evidence the government's capacity increased after mobilization. But I can explore the hypothesis further using the disaggregated revenues across the 10 precincts.

5 Empirical Test of External Revenue Shock on State Capacity

5.1 External Revenue Shock Increased Fiscal Capacity

The data in Table 1 show that income taxes increased after the tax reform. This suggests the tax reform worked and may be evidence it increased fiscal capacity too. But since it was inspired by concerns about World War II mobilization, there could be other coincident factors from the war that increased income tax revenues. For example, President Lescot also responded to the war by developing rubber exports to meet global shortages (Smith 2009 pp. 44–47). While his plan ultimately failed, it reflects how the war introduced possible confounding factors.

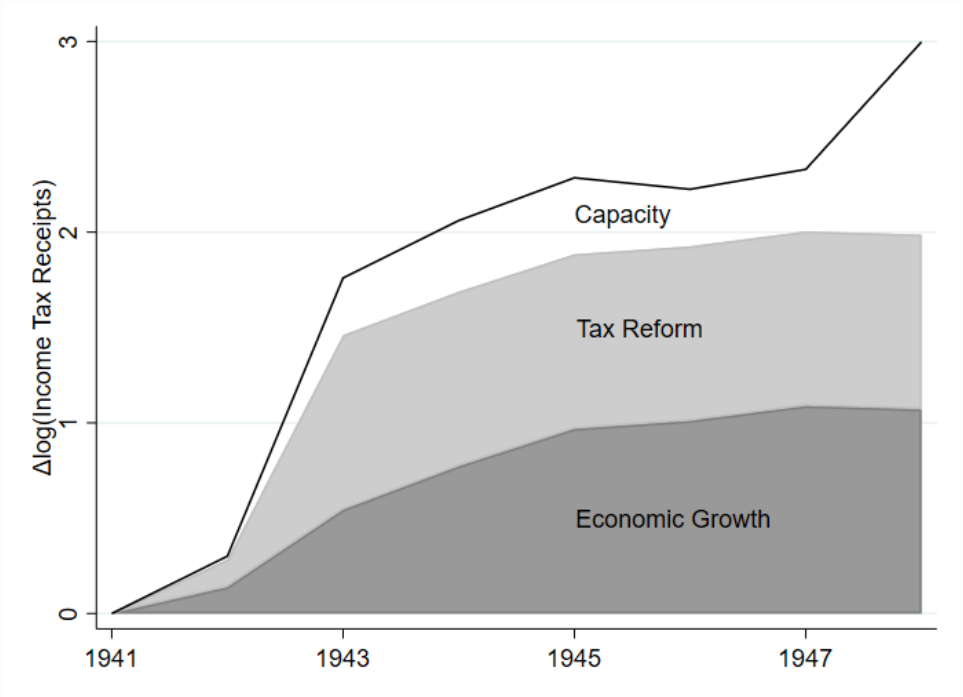
To uncover the link between the external revenue shock and fiscal capacity, I decompose the tax revenue growth. Note that tax revenue in year s is defined as $R_s = t_s p_s Y_s$, where Y_s is income, p_s is property right protection, and t_s is the realized tax rate. Since revenues depend on the government's ability to collect taxes, the realized tax rate is the official tax rate (t_s^o) times the share of income that the government can observe (x_s). For example, if the official tax rate is 10% but 50% of income is hidden from the government, then the realized tax rate is 5%. Thus revenues can be expressed as $R_s = t_s^o x_s p_s Y_s$, and changes in R_s can be decomposed as

$$\Delta \ln R_{s0} = \Delta \ln t_{s0}^o + \Delta \ln Y_{s0} + \Delta \ln(x_{s0} p_{s0}), \tag{18}$$

where the $s0$ subscript indicates the difference between year s and the base year. Thus, changes in tax revenue are the sum of changes in the official tax rate, changes in income, and changes in how much income the government observes and protects. This last term, $\Delta \ln(x_{s0} p_{s0})$, reflects changes in state capacity.

Although the capacity term is unobservable, I can estimate $\Delta \ln R_{s0}$, $\Delta \ln t_{s0}^o$, and $\Delta \ln Y_{s0}$, and then infer $\Delta \ln(x_{s0} p_{s0})$ as the residual. I can directly calculate $\Delta \ln R_{s0}$ because I observe how much income tax is collected every year. While I know how tax rates changed, I cannot directly calculate $\Delta \ln t_{s0}^o$ because the tax change differed across brackets (see Table 2) and I do not know

Figure 5. Decomposition of income tax revenue growth, 1941–1948



Notes: The solid black line shows the change in income tax revenue ($\Delta \ln R_{s0}$) relative to 1941. The light gray area shows the portion of the change in revenue that is attributed to economic growth ($\Delta \ln Y_{s0}$), and the dark gray area shows how much is attributed to the 1942 tax reform ($\Delta \ln t^{o}_{s0}$). The remaining portion, in white, is the residual and attributed to changes in capacity.

the distribution of income. But I can calculate an upper bound by assuming the entire distribution experienced the largest change, which was the highest tax bracket going from 6% to 15%. Since this tax rate change is larger than if economic growth shifted the entire income distribution up to the next bracket, I am confident it is an upper bound estimate. Estimating $\Delta \ln Y_{s0}$ is harder because we do not have GDP estimates for Haiti over this period. But calculating $\Delta \ln Y_{s0}$ is the same as estimating how tax revenues would have grown without the tax reform, and this counterfactual is easy to estimate using synthetic control methods (Abadie et al. 2010). I explain the synthetic control process in Appendix Figure A1. In calculating all of these terms, I use inflation-adjusted figures and use 1941 as the base year.

Figure 5 shows the decomposition of tax revenue growth into the changes from economic growth, tax reform, and capacity expansion. In 1943, the first full year of the tax reform, the reform ($\Delta \ln t^{o}_{s0}$) accounted for at most 52% of the change in revenues, with economic growth ($\Delta \ln Y_{s0}$) accounting for another 31%. But that leaves at least 17% of the 1943 growth unaccounted for. In fact, in all years, the tax reform and economic growth explain about 80% of the growth. This

unexplained 20% is evidence that the fiscal response to World War II detailed above—hiring more personnel, purchasing cars, and constructing tax offices—increased state capacity.

These results confirm that $\partial\tau_1^*/\partial M < 0$, which is consistent with the baseline model. Since the baseline model is supported by the literature, this is not a surprising result. But it is still helpful for the augmented model, where we were unsure about the sign. Next, we want to investigate the sign of $\partial\pi_1^*/\partial M$.

5.2 External Revenue Shock Increased Legal Capacity

The income tax revenue results are consistent with both the baseline and augmented models. To distinguish between the two, I need to look at how mobilization affected legal capacity. If the baseline model holds, I should see that the shock to external revenues caused the government to invest less in legal capacity ($\partial\tau_1^*/\partial M > 0$). But if the augmented model is true, I could observe an increase in legal capacity ($\partial\tau_1^*/\partial M < 0$) if the legal capacity cost curve depends on the level of fiscal capacity. I present evidence that the fall in external revenues led to greater investments in legal capacity. This suggests that there are investment complementarities between fiscal and legal capacities, which I explore in the next subsection.

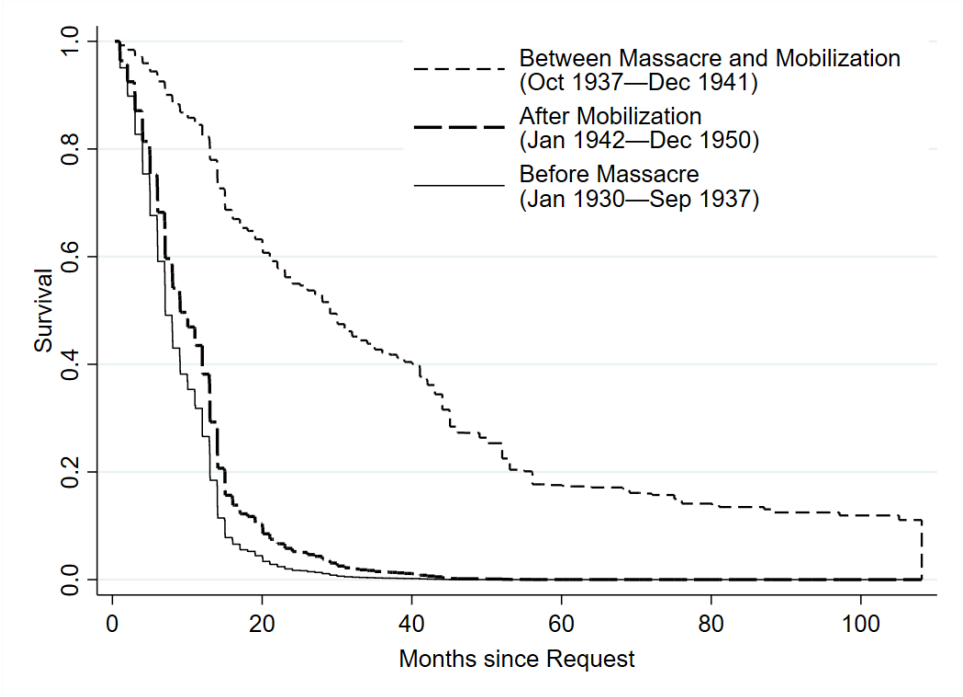
My first evidence that legal capacity increased after U.S. mobilization is that HIRS processed requests faster. I showed above (Figure 3) that delays increased after the refugees' arrival and that the delays shrank after U.S. mobilization. Here, I want to dissect the effects of the refugee shock and U.S. mobilization using a hazard model. I estimate a Cox hazard model, where the hazard for property request i being processed is given by:

$$\lambda_i(t|X_i(t)) = \lambda_0(t)\exp(\beta' X_i(t)) \tag{19}$$

where $\lambda()$ is the hazard function (failure is defined as the government processing the request); λ_0 is the base rate hazard; t is the number of months in the queue; and X are the included covariates for property request i. I include covariates on permanent features of the property request—its type (urban or rural) and the number of properties in the queue when the property was requested—as well as time-varying features—a dummy for whether t is after the massacre and another dummy for whether t is after U.S. mobilization.

The hazard model captures the effects of the external revenue shock and the influx of refugees with the time-varying indicators. The indicators can vary because the shocks occur while the property request sits in a queue. So if a request was submitted in July 1937, the massacre indicator

Figure 6. Probability that property is still pending given the number of months since requested



Notes: Survival curves derived from a Cox proportional hazard model that controlled for property type, the number of properties in the program's queue at the time of the request, and dummy variables for when the massacre and reform occurred.

would equal zero; but if the request was still in the queue in November 1937, the indicator would equal one. Similarly, the U.S. mobilization indicator is equal to zero for months before January 1942 and one for January and all months after. Thus the hazard model accounts for the events happening while the request is still processing, which is important for capturing the dynamics of the investments.

The primary interest of the analysis is to see how the revenue shock and refugee influx affected the processing time for requests. From the hazard model, I can derive survival curves (where death means the property was processed) evaluated at three different periods: before the massacre, between the massacre and U.S. mobilization, and after U.S. mobilization.[8] I plot the three survival curves in Figure 6. Before the massacre, the graph indicates there was a 20% chance approval would take longer than eight months. Then it shows processing times increased substantially between the massacre and U.S. mobilization. The probability that approval would take longer than eight months increased to 85%, and there was a 20% chance it would take longer than four years. But once U.S.

[8]Note that these three points correspond to three combinations of dummy variables. Before the massacre, both dummy variables equal zero. Between the massacre and the reform the massacre dummy equals 1 but the reform dummy equals zero. And for after the reform both the massacre and reform dummies equal one.

mobilization forced external revenues to decline, the curve returned to pre-massacre levels.

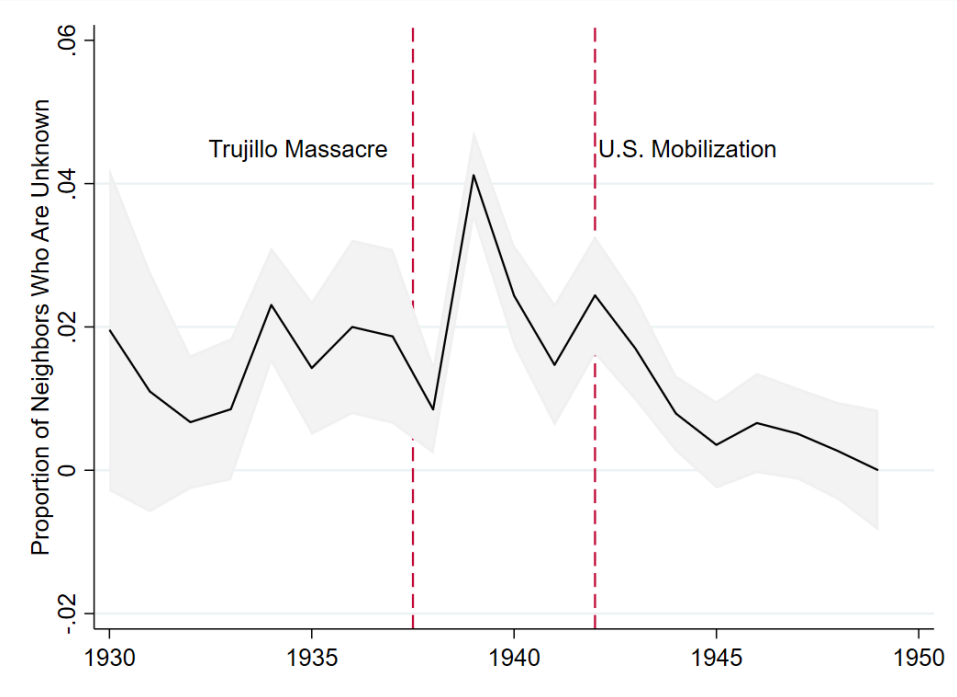
The curve's return to the pre-massacre survival curve, even as more requests enter, suggests there might be an equilibrium level of state capacity relative to the demands placed on it. Before the refugees arrived, the government was in a capacity-request equilibrium. But it left the equilibrium when the refugee shock flooded it with requests beyond its capacity to process. Because the government did not expand capacity, delays increased. But once World War II altered external revenues, it expanded capacity, and the government returned to the pre-refugee capacity-request equilibrium.

An additional piece of evidence that legal capacity increased after U.S. mobilization comes from the demarcation of property. For a state to protect property, it must demarcate the land so it knows what it is protecting. While some states demarcate properties through geographic coordinates, the most common system is metes and bounds, which defines properties by their local environment. HIRS used the metes and bounds system, defining properties by features such as roads and, most commonly, by who occupied adjacent properties. But states struggle to provide full property protection under the metes and bounds system because of its dependence on local knowledge and its vague definitions of property boundaries (Libecap and Lueck 2011). And states with low capacity might struggle even more under a metes and bounds system (Dimitruk et al. 2021).

One of the main purposes of the rental notifications was to demarcate properties, but HIRS often provided incomplete descriptions. The most common incomplete description was to say that the adjacent property was occupied by "Qui de droit," that is, "Whoever owns it." This could be an admission that the HIRS agent could not find the property's owner. But it also could indicate that the agent decided that the benefit of finding the owner was not worth the effort. This incomplete demarcation, however, creates insecurity for the tenant. Thus, reducing incomplete demarcations is a sign of greater legal capacity.

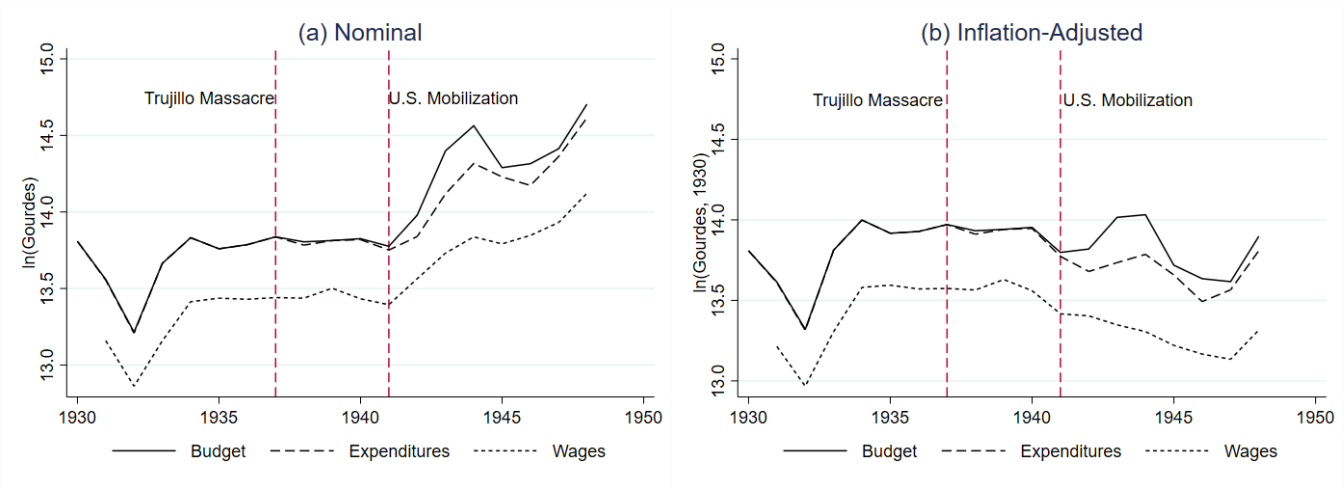
Figure 7 shows the proportion of property boundaries with incomplete demarcation by request year. I define a boundary as incompletely demarcated if HIRS reported the occupant as "Qui de droit." For each property, HIRS reported four boundaries. Before the massacre, between 1 and 2% of boundaries were incompletely demarcated. After the massacre, this figure peaks at 4% at the same time properties experienced the longest delay between request and approval (see Figure 3). This is further evidence that legal capacity was strained during this period. But after U.S. mobilization, the proportion of incomplete boundaries rapidly decreased until it approached zero.

Figure 7. Proportion of property boundaries with incomplete demarcation, 1930-1949



Notes: A neighbor is unknown if the notification in *Le Moniteur* names the neighbor as "Qui de droit" or "Whoever owns it." Each property has four neighbors (one for each cardinal direction). The gray area indicates the 95% confidence interval for proportion of neighbors who are unknown. Confidence intervals come from a pooled regression with the proportion of unknown neighbors as the dependent variable and year-dummies as the only explanatory variable.

Figure 8. Budget, expenditures, and wages for the internal revenue service, 1930-1948



Notes: Data come from the Annual Reports of the Fiscal Representative.

Legal capacity had expanded.

Contrary to the baseline model, the external revenue shock led to greater legal capacity ($\partial \pi_1^* / \partial M > 0$). The higher capacity let the state reduce processing delays after U.S. mobilization and define properties better. In the augmented model, this is possible if investments in fiscal capacity significantly reduce the cost of investing in legal capacity. I explore this question next.

6 Evidence for Complementarities in Production

The effect of U.S. mobilization on Haiti's legal capacity suggests the baseline model is incorrect, but it supports the case for fiscal capacity shifting the cost of investing in legal capacity. Using the institutional history of Haiti, I suggest two reasons why investments in fiscal and legal capacity were complements in production.

6.1 Institutional Evidence

First, Haiti's appropriations law treated internal revenues and customs revenues differently. HIRS's budget came entirely from internal taxes—10% of all internal revenues and 15% of all communal taxes collected by HIRS (Banque nationale de la Republique d'Haiti 1942 p 15). None of it came from customs revenue. From 1934 to 1941, the nominal budget was flat, as shown in Figure 8a. In that same figure, the budget is almost indistinguishable from expenditures before 1942 because HIRS spent its entire allocation. This provides a partial answer for why the state did not invest

in legal capacity when the refugees started coming at the end of 1937: HIRS was already spending all of its budget and could not make room for expanding state capacity. The budget could have expanded if the government had changed the appropriations law to divert customs revenues to address the refugee crisis, but a reform would have required a costly political process. Since HIRS controlled its share of internal revenues, the nominal budget would naturally expand if internal revenues increased. Indeed, it doubled by 1944 after the external revenue shock triggered the income tax reform. As the budget expanded, so did expenditures and state capacity.

A second reason legal capacity increased after U.S. mobilization was because the same administration collected taxes and processed land rentals. Much of the increase in HIRS expenditures went to personnel. Figure 8a shows HIRS spent a significant share of its budget on wages, and that expenditures for wages increased after the reform. When the government expanded personnel to collect income taxes, those same personnel could be used to run the land rental program.

Surprisingly, the nominal expenditures increased legal capacity even though real expenditures were falling. After adjusting for inflation using Bulmer-Thomas's (2012) price index, we see real expenditures began falling in 1940 (see Figure 8b). This is puzzling because we have the evidence above showing that the government was hiring more personnel, buying vehicles, building tax offices, collecting extra tax revenues, and delivering better results for property rights all while real expenditures were lower. There are two potential solutions to this puzzle. One is that the Bulmer-Thomas index, which is derived from Dominican data, overstates inflation in Haiti. Another is that wages are sticky and higher nominal expenditures on wages meant HIRS was hiring more workers at lower real wages. This explanation is supported by Bulmer-Thomas, "Until 1940, with the possible exception of Cuba, nominal wage rates exhibited very little variation in the Caribbean....Thus, an increase in current revenue is likely to have translated not only into an increase in real revenue but also real expenditures because it could purchase more teachers, soldiers, nurses, clerks, and so on" (pp. 570–71). Indeed, this hypothesis is supported in Figure 8b with the gap between the budget and expenditure. In 1943 and 1944, the real value of the HIRS budget was higher than it was in all previous years, which means HIRS could have paid higher real wages (which one imagines the workers would have demanded) but did not. Unfortunately, while sticky wages is an attractive hypothesis, we do not have data on HIRS employment to explore this further. Hopefully future work can resolve this puzzle.

Despite the puzzle with real expenditures, Haiti's institutional arrangements support the case for complementarities between investments in fiscal and legal capacity.

6.2 Empirical Evidence

While the institutional evidence for complementarities is strong, we can get further evidence by looking at rental collections after U.S. mobilization. The rental collections show how the complementarities go both ways.

While rental revenues should increase after a wave of new property approvals, the program could have not collected more rent for two reasons. First, as seen in Table 3, the program historically had low collection rates. With how easily it was overwhelmed by the requests, the program might have also struggled to collect the new rents. Second, it could not increase rental revenues if tenants left their leases. If tenants felt that the rent did not justify the protections they received, they could exercise their outside option and squat on unoccupied land. This is especially true for the ones who had waited years to get their requests approved and might have found attractive outside options while waiting. If the program tried to improve its efficiency by collecting rents without protecting claims, it would fail. Thus, higher revenues is evidence that it was providing legitimate property protections.

To see how U.S. mobilization affected rental revenues, I can use the fact that the rented properties were disproportionately in areas with refugees. If legal capacity improved, then I expect rent collection to increase in these areas. To test this hypothesis, I compare rent collections in tax precincts with and without refugees using a synthetic control analysis (Abadie et al. 2010). I use synthetic control because the data on rent collections are available only at the tax precinct level, of which there are ten in the country during this period, of which only two hosted refugee camps (see Figure 2). In cases like this with small sample sizes, synthetic control improves on difference-in-differences by weighting control observations to best match the treatment group. Although I focus on the results from the synthetic control analysis, the Appendix contains the synthetic control results to difference-in-differences, revealing similar results.

Because I have limited data, constructing the synthetic control is straightforward. I compare rent collections in precincts with refugees (treated precincts) to precincts without refugees (control precincts). Because the precincts are treated by the refugees before U.S. mobilization, I use October 1937 as the treatment date. This lets me look at how the precincts behaved when the refugees arrive and if there was a change in 1942. I estimate the synthetic control weights from taxes collected from October 1933 to September 1937. Tax receipts are adjusted for inflation and transformed with a logarithmic transformation and normalized to zero in 1937 (the financial year before the refugees arrived).

Figure 9. The effect of refugees and U.S. mobilization on receipts from public land rentals, 1930-1948

Notes: Figures display the treatment and synthetic control units. Panel (a) displays land rental receipts, the variable of interest, and (b) shows property transfer receipts, the placebo. The dark red line indicates when treatment was assigned in the synthetic control analysis (when the refugees arrived). The light dashed line indicates the 1942 U.S. mobilization, though the analysis did nothing to account for it.

The synthetic control analysis shows that the refugees had a large and sustained impact on public land rental receipts, and the effect was magnified by the U.S. mobilization's effect on capacity. Tax receipts for the refugee precincts and the synthetic control are plotted in Figure 9a. From 1933 to 1937, the two groups followed similar patterns. But after 1937, the precincts diverged. Between the refugees' arrival in 1938 and mobilization at the end of 1941, rental revenues in refugee precincts were about 20% higher than non-refugee precincts (p-values are significant and reported in Table A1). After U.S. mobilization, refugee precincts increased yet again by about 20%, widening the gap between the two types.

The evidence in Figure 9a is consistent with legal capacity increasing after U.S. mobilization. But the analysis be confounded by a separate economic shock that also increased land values and was coincident with both the timing of the reform and the location of the refugees. For instance, U.S. mobilization may have increased demand for goods produced in the refugee precincts, which subsequently increased land values. This concern is valid but fails to explain why there are unmistakable shifts not just when the U.S. mobilized but also when the refugees first came. Regardless, to address the concern, I do a placebo synthetic control analysis, replacing the dependent variable with documentary recording fees; i.e. fees collected from recording mortgages and property transfers. This analysis is a great placebo test because, like the rental receipts, the fees are related to the value of land, but the refugees did not have the assets to get mortgages or buy property. Thus, it should not show any differences between precincts.

Figure 9b displays the treatment and synthetic control units using property transfer receipts as the dependent variable. The patterns in property transfer receipts are distinct from the patterns found for land rental receipts. They show no evidence of a shock to recording fees that was unique to refugee precincts, neither following the refugees' entrance nor after U.S. mobilization. The post-1942 patterns are similar across all precincts.

This empirical exercise demonstrates how fiscal and legal capacity reinforce each other. The tax reform increased HIRS's budget, which led to more properties processed. Because more properties were occupied, HIRS collected more rent. By expanding one, it improved the other. While these complementarities should encourage governments to invest in capacity, external revenues may be high enough to impede investing in either.

7 Conclusion

This paper provides evidence that since external revenues limit fiscal capacity, they may also stop governments from improving legal capacity. Rather than investing in legal capacity when customs revenues were high, the Haitian government waited to invest in legal capacity until after low customs revenues forced it to invest in fiscal capacity. Its combined investment in legal and fiscal capacity can be explained by institutional constraints and complementarity between the two investments.

When thinking of how these results translate to other contexts, we need to understand the conditions that allow a shock to external revenues to translate into increases in fiscal and legal capacity. We see an appropriate parallel in the theory that war builds state capacity. This theory dates at least to Tilly (1990), and it has received significant empirical support (Besley and Persson 2009, Dincecco et al. 2011). But the theory depends on additional factors. For example, war does not build fiscal capacity when the state has access to international credit markets (Queralt 2019), and political geography can affect whether conflict builds capacity or entrenches autocracy (Dincecco and Wang 2018). Just like it would be rash to say that war is good for a country's long-term development, we should be careful in concluding that shocks to customs revenues are beneficial without a more detailed understanding of the country's institutions. Haiti happened to have insitutions that translated this shock into better capacity. If other countries lack these institutions, this has limited external application.

But Haiti's institutions may not be unique. For instance, one reason this shock had broader effects on state capacity is Haiti's institutional constraints connected expansions in fiscal and legal capacity. For these results to apply in other countries, their institutions would need to link investments in capacity. Evidence from France suggests that investment complementarities are not unique to Haiti (Johnson and Koyama 2014). Since many other Latin American countries had a similar reliance on customs revenues, it could be promising to look at such countries for further evidence.

Another avenue worth exploring is the effects of external revenues on legal capacity when property protection has greater political ramifications. In the Besley and Persson (2009) model, the government always wants to protect property rights, independent of group identity. But Albertus (2021) highlights how many Latin American governments intentionally weaken property rights as a form of political control. While the government of Haiti was willing to improve property rights for the public land rentals, other governments might be less willing to protect property. Thus, the effect of external revenues may differ.

Regarding Haitian history, this paper points to fruitful directions to pursue. The land rental data show that HIRS improved its ability to process property requests, but we do not have concrete details on how the program achieved this. HIRS likely used new personnel to help with processing, but administrative records could clarify the microfoundations of expanding state capacity.

Figure A1. Income tax growth compared to a synthetic income tax path

A Appendix

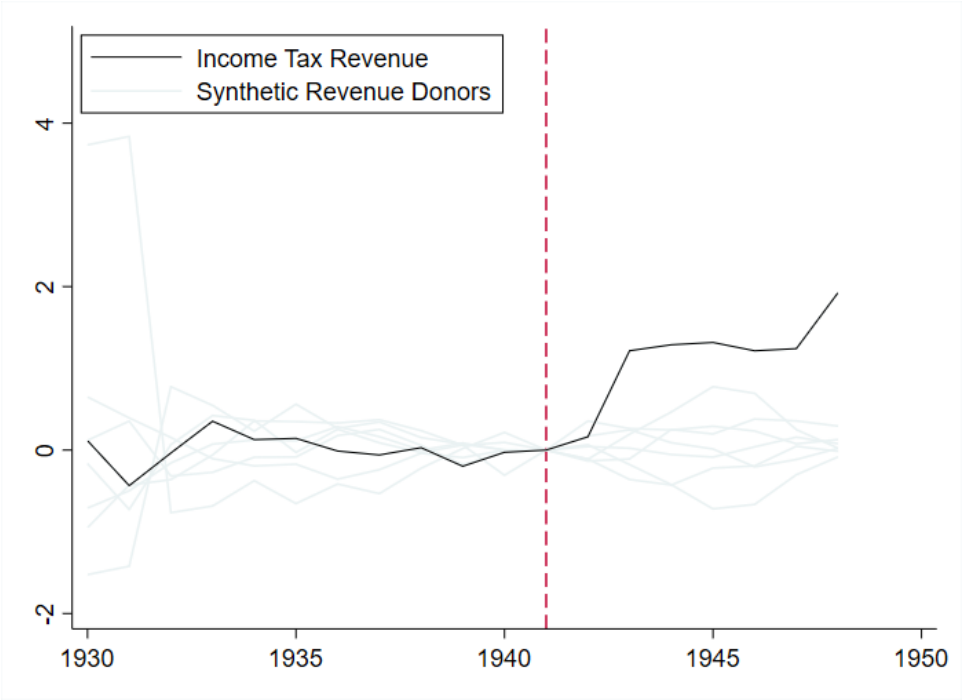
A.1 Synthetic Income Tax Revenue

To estimate the counterfactual growth in tax revenues, I collect seven macroeconomic variables that should correlate with income growth but should not be affected by the tax reform or changes in state capacity: the amount of deposits in Haitian banks, the amount of loans from Haitian banks, the total value of exports from Haiti, and the price of four main commodity exports (coffee, cotton, sisal, and sugar).[9] I adjust all indicators for inflation using the Bulmer-Thomas index. I then take the natural logarithm of income tax revenues and the seven control variables, and I normalize all to be zero in 1941 (thus, the transformed variables reflect growth relative to 1941). The synthetic control process finds a set of weights for the seven macroeconomic variables such that the weighted time series before the revenue shock mimics the time series of the income tax revenue. Applying the weights to the post-mobilization period gives a synthetic counterfactual path for income tax revenue growth.

The results are displayed in Figure A1. The dashed gray line shows the synthetic revenue growth while the solid black line depicts the actual growth path of income tax revenues. In the

[9] All variables are collected from the Annual Reports.

Figure A2. Prediction differences for treatment and all donors



pre-period, the two time series are similar. But following mobilization, the two series diverge. Both are increasing, consistent with mobilization increasing incomes. But income tax revenue grows much faster than the synthetic control. Importantly, most of this growth comes in the first year of the income tax reform's full implementation.

Figure A2 depicts the predicted differences for income tax revenues (solid black line) and the seven donor macroeconomic variables (light gray lines) when the synthetic control is run separately for each variable. Thus, the light gray lines provide placebo effects when assuming, for example, that loans from Haitian banks were treated by mobilization and income tax revenues are a control. In the pre-mobilization period, income tax revenues are in the middle of the series, indicating no significant difference in pre-treatment trends. But after mobilization, income tax revenues diverge distinctly from any other series. When comparing the post-treatment differences in income tax revenue growth to the distribution of differences in the donor variables, every year after 1942 is statistically different.

A.2 Comparing Synthetic Control to Event Study

The synthetic control analysis presented in Section 4 provides convincing evidence that the refugees and the capacity expansion had significant effects on tax revenues. But a weakness of the synthetic

control analysis is that researchers have some degrees of freedom in selecting the synthetic control. To assuage concerns about researcher bias, I also estimate a difference-in-difference event study and compare the estimated treatment effects to the synthetic control. To test for refugee effects on tax receipts, I run the following regression

$$\ln T_{it} = \delta_i + \delta_t + \beta_t(Refugee_i \times \delta_t) + \varepsilon_{it} \tag{20}$$

where T_{it} is, for tax precinct i in year t, the tax receipts from land rentals (though in other situations below, the dependent variable will be taxes in other categories). The regression includes fixed effects for the year (δ_i) and the precinct (δ_t). The $Refugee_i$ variable is an indicator for whether the tax precinct hosted a refugee camp, and the β_t gives, for year t, the difference in receipts between refugee and non-refugee tax precincts. Because there are only 10 precincts, I obtain confidence intervals for β_t using the wild bootstrap-t methods described in Cameron et al. (2008) and implemented in Stata by Judson Caskey.

A.3 Proof

$$\frac{\partial U}{\partial \pi_1} = \frac{\alpha\left(\tau_1^* Y - L'(\pi_1^* - \pi_0)\right)}{\tau_1^*\pi_1^* Y + M - L(\pi_1^* - \pi_0) - F(\tau_1^* - \tau_0)} + \frac{1}{\pi_1^*} = 0 \tag{21}$$

$$\frac{\partial U}{\partial \tau_1} = \frac{\alpha\left(\pi_1^* Y - F'(\tau_1^* - \tau_0)\right)}{\tau_1^*\pi_1^* Y + M - L(\pi_1^* - \pi_0) - F(\tau_1^* - \tau_0)} - \frac{1}{1 - \tau_1^*} = 0. \tag{22}$$

The Hessian of the system created by Equations (6) and (7) is

$$\begin{pmatrix} -\frac{\alpha\Omega L''(\pi_1-\pi_0)+\alpha(\tau_1 Y - L'(\pi_1-\pi_0))^2}{\Omega^2} - \frac{1}{\pi_1^2} & \frac{\alpha\Omega Y - \alpha(\tau_! Y - L'(\pi_1-\pi_0))(\pi_1 Y - F'(\tau_1-\tau_0))}{\Omega^2} \\ \frac{\alpha\Omega Y - \alpha(\tau_! Y - L'(\pi_1-\pi_0))(\pi_1 Y - F'(\tau_1-\tau_0))}{\Omega^2} & -\frac{\alpha\Omega F''(\tau_1-\tau_0)+\alpha(\pi_1 Y - F'(\tau_1-\tau_0))^2}{\Omega^2} - \frac{1}{(1-\tau_1)^2} \end{pmatrix} \tag{23}$$

where $\Omega = \tau_1\pi_1 Y + M - L(\pi_1 - \pi_0) - F(\tau_1 - \tau_0)$. For this to be an optimum, the determinant of this matrix has to be positive.

Note that at the optimum

$$\frac{\alpha}{\tau_1^*\pi_1^* Y + M - L(\pi_1^* - \pi_0) - F(\tau_1^* - \tau_0)} = \frac{1}{(1-\tau_1)\pi_1 Y} \tag{24}$$

$$\alpha(1-\tau_1)\pi_1 Y = \tau_1^*\pi_1^* Y + M - L(\pi_1^* - \pi_0) - F(\tau_1^* - \tau_0) = \Omega \tag{25}$$

Table A1. Treatment effect estimates for synthetic control and difference-in-differences analysis

	Land Rental Receipts		Property Transfer Receipts	
	SC	ES	SC	ES
1938	0.20	0.22	0.09	0.11
	[0.00]	[0.095]	[0.27]	[0.51]
1939	0.20	0.15	0.02	0.023
	[0.02]	[0.073]	[0.83]	[0.68]
1940	0.23	0.23	-0.17	-0.13
	[0.14]	[0.061]	[0.38]	[0.51]
1941	0.23	0.22	-0.30	-0.27
	[0.06]	[0.025]	[0.02]	[0.077]
1942	0.47	0.45	0.03	0.069
	[0.00]	[0.001]	[0.83]	[0.69]
1943	0.50	0.50	0.30	0.34
	[0.00]	[0.0001]	[0.03]	[0.017]
1944	0.49	0.42	0.12	0.16
	[0.00]	[0.0013]	[0.44]	[0.25]
1945	0.53	0.45	-0.01	0.014
	[0.02]	[0.0032]	[0.92]	[0.94]
1946	0.51	0.43	0.10	0.13
	[0.02]	[0.013]	[0.69]	[0.38]
1947	0.47	0.39	0.13	0.16
	[0.08]	[0.025]	[0.55]	[0.31]
1948	0.53	0.42	0.15	0.20
	[0.11]	[0.040]	[0.45]	[0.32]
1949	0.49	0.39	0.10	0.14
	[0.17]	[0.074]	[0.38]	[0.28]

Notes: P-values in brackets. The column headers indicate the approach used to estimate the treatment effects—SC means synthetic control and ES means event study.

So the sign of $\frac{\partial \pi_1^*}{\partial M}$ is the sign of

$$
\begin{aligned}
-\left(-\frac{\alpha\left(\tau_1^* Y - L(\pi_1^* - \pi_0)\right)}{\Omega^{*2}}\right)\left(-\frac{\alpha\Omega F''(\tau_1-\tau_0)+\alpha(\pi_1 Y - F'(\tau_1-\tau_0))^2}{\Omega^2} - \frac{1}{(1-\tau_1)^2}\right) \\
+\left(-\frac{\alpha\left(\pi_1^* Y - F'(\tau_1^* - \tau_0)\right)}{\Omega^{*2}}\right)\left(\frac{\alpha\Omega Y - \alpha(\tau_! Y - L'(\pi_1-\pi_0))(\pi_1 Y - F'(\tau_1-\tau_0))}{\Omega^2}\right) \\
= \frac{\alpha F''(\tau_1-\tau_0)}{\Omega^{*2}\pi_1^*} + \frac{1+\alpha}{\alpha\Omega^*\pi_1^*(1-\tau_1^*)^2} - \frac{1+\alpha}{\alpha\Omega^*\pi_1^*(1-\tau_1)^2} \\
= \frac{\alpha F''(\tau_1-\tau_0)}{\Omega^{*2}\pi_1^*} \\
> 0
\end{aligned}
$$

So the sign of $\frac{\partial \tau_1^*}{\partial M}$ is the sign of

$$
\begin{aligned}
-\left(-\frac{\alpha(\pi_1^* Y - F'(\tau_1^* - \tau_0))}{\Omega^{*2}}\right)\left(-\frac{\alpha\Omega L''(\pi_1-\pi_0)+\alpha(\tau_1 Y - L'(\pi_1-\pi_0))^2}{\Omega^2} - \frac{1}{\pi_1^2}\right) \\
+\left(-\frac{\alpha\left(\tau_1^* Y - L(\pi_1^* - \pi_0)\right)}{\Omega^{*2}}\right)\left(\frac{\alpha\Omega Y - \alpha(\tau_! Y - L'(\pi_1-\pi_0))(\pi_1 Y - F'(\tau_1-\tau_0))}{\Omega^2}\right) \\
= -\frac{\alpha L''(\pi_1-\pi_0)}{\Omega^{*2}(1-\tau_1^*)} - \frac{1+\alpha}{\alpha\Omega^*\pi_1^{*2}(1-\tau_1)} + \frac{\alpha+1}{\alpha\Omega^*\pi_1^{*2}(1-\tau_1)} \\
= -\frac{\alpha L''(\pi_1-\pi_0)}{\Omega^{*2}(1-\tau_1^*)} \\
< 0
\end{aligned}
$$

A.4 Augmented Model

$$
\frac{\partial U}{\partial \pi_1} = \frac{\alpha\left(\tau_1^* Y - L_\pi(\pi_1^* - \pi_0, \tau_1) - F_\pi(\tau_1^* - \tau_0, \pi_1)\right)}{\tau_1^*\pi_1^* Y + M - L(\pi_1^* - \pi_0, \tau_1) - F(\tau_1^* - \tau_0)} + \frac{1}{\pi_1^*} = 0 \tag{26}
$$

$$
\frac{\partial U}{\partial \tau_1} = \frac{\alpha\left(\pi_1^* Y - L_\tau(\pi_1^* - \pi_0, \tau_1) - F_\tau(\tau_1^* - \tau_0)\right)}{\tau_1^*\pi_1^* Y + M - L(\pi_1^* - \pi_0, \tau_1) - F(\tau_1^* - \tau_0)} - \frac{1}{1-\tau_1^*} = 0. \tag{27}
$$

The Hessian of the system created by Equations (6) and (7) is

$$
\begin{pmatrix}
-\frac{\alpha\Omega(L_{\pi\pi}+F_{\pi\pi})+\alpha(\tau_1 Y - L_\pi - F_\pi)^2}{\Omega^2} - \frac{1}{\pi_1^2} & \frac{\alpha\Omega(Y - L_{\pi\tau} - F_{\pi\tau}) - \alpha(\tau_1 Y - L_\pi - F_\pi)(\pi_1 Y - L_\tau - F_\tau)}{\Omega^2} \\
\frac{\alpha\Omega(Y - L_{\pi\tau} - F_{\pi\tau}) - \alpha(\tau_1 Y - L_\pi - F_\pi)(\pi_1 Y - L_\tau - F_\tau)}{\Omega^2} & -\frac{\alpha\Omega(L_{\tau\tau}+F_{\tau\tau})+\alpha(\pi_1 Y - L_\tau - F_\tau)^2}{\Omega^2} - \frac{1}{(1-\tau_1)^2}
\end{pmatrix} \tag{28}
$$

The sign of $\frac{\partial \pi_1^*}{\partial M}$ is the sign of

$$sign\left(\frac{\alpha(1-\tau_1^*)^2(L_{\tau\tau}+F_{\tau\tau})+\alpha\pi_1^*(1-\tau_1^*)(L_{\pi\tau}+F_{\pi\tau})}{\Omega^2\pi_1^*(1-\tau_1)^2}\right)$$

Note that $L_{\tau\tau}+F_{\tau\tau}>0$ and $L_{\pi\tau}+F_{\pi\tau}<0$, so the sign is determined by the relative sizes.

The sign of $\frac{\partial \tau_1^*}{\partial M}$ is the sign of

$$sign\left(-\frac{\alpha\pi_1^{*2}(L_{\pi\pi}+F_{\pi\pi})+\alpha\pi_1^*(1-\tau_1^*)(L_{\pi\tau}+F_{\pi\tau})}{\Omega^2\pi_1^{*2}(1-\tau_1^*)}\right)$$

References

Abad, L. and Maurer, N.: 2021, When interventions fail: Lessons from the U.S. experience in Latin America, *Centre for Economic Policy Research DP16585* .

Abadie, A., Diamond, A. and Hainmueller, J.: 2010, Synthetic control methods for comparative case studies: Estimating the effect of California's tobacco control program, *Journal of the American Statistical Association* **105**(490), 493–505.

Agyei-Holmes, A., Buehren, N., Goldstein, M., Osei, R., Osei-Akoto, I. and Udry, C.: 2020, The effects of land title registration on tenure security, investment and the allocation of productive resources : Evidence from ghana, *Policy Research Working Paper;No. 9376. World Bank* .

Albertus, M.: 2021, *Property Without Rights: Origins and Consequences of the Property Rights Gap*, Cambridge University Press.

Arias, L. M.: 2013, Building Fiscal Capacity in Colonial Mexico: From Fragmentation to Centralization, *The Journal of Economic History* **73**(3), 662–693.

Arroyo Abad, L. and Maurer, N.: 2017, Could Europe run Greece? lessons from U.S. fiscal receiverships in Latin America, 1904–34., *Mimeograph* .

Banque nationale de la Republique d'Haiti: 1942, Annual Report of the Fiscal Department for the Fiscal Year October 1941–September 1942, Port-au-Prince, Haiti: Imprimerie de l'Etat.

Banque nationale de la Republique d'Haiti: 1943, Annual Report of the Fiscal Department for the Fiscal Year October 1942–September 1943, Port-au-Prince, Haiti: Imprimerie de l'Etat.

Banque nationale de la Republique d'Haiti: 1944, Annual Report of the Fiscal Department for the Fiscal Year October 1943–September 1944, Port-au-Prince, Haiti: Imprimerie de l'Etat.

Besley, T. and Ghatak, M.: 2010, *Handbook of Development Economics, Volume 5*, Elsevier, chapter Property Rights and Economic Development, pp. 4525–4595.

Besley, T. and Persson, T.: 2009, The origins of state capacity: Property rights, taxation, and politics, *American Economic Review* **99**(4), 1218–1244.

Besley, T. and Persson, T.: 2010, State capacity, conflict, and development, *Econometrica* **78**(1), 1–34.

Bulmer-Thomas, V.: 2012, *The Economic History of the Caribbean since the Napoleonic Wars*, Cambridge University Press.

Cameron, A. C., Gelbach, J. B. and Miller, D. L.: 2008, Bootstrap-based improvements for inference with clustered errors, *The Review of Economics and Statistics* **90**(3), 414–427.

Centeno, M. A.: 1997, War and taxation in nineteenth-century Latin America, *American Journal of Sociology* **102**(6), 1565–1605.

Chari, A., Liu, E. M., Wang, S.-Y. and Wang, Y.: 2020, Property rights, land misallocation, and agricultural efficiency in China, *The Review of Economic Studies* **88**(4), 1831–1862.

de Soto, H.: 2000, *The Mystery of Capital: Why Capitalism Triumphs in the West and Fails Everywhere Else*, Basic Books.

Dimitruk, K., Plessis, S. D. and Plessis, S. D.: 2021, De jure property rights and state capacity: evidence from land specification in the boer republics, *Journal of Institutional Economics* pp. 1–17.

Dincecco, M.: 2015, The rise of effective states in Europe, *The Journal of Economic History* **75**(3), 901–918.

Dincecco, M., Federico, G. and Vindigni, A.: 2011, Warfare, taxation, and political change: Evidence from the italian risorgimento, *The Journal of Economic History* **71**(4), 887–914.

Dincecco, M. and Wang, Y.: 2018, Violent conflict and political development over the long run: China versus europe, *Annual Review of Political Science* **21**(1), 341–358.

Field, E.: 2007, Entitled to work: Urban tenure security and labor supply in Peru, *Quarterly Journal of Economics* **122**(4), 1561–1602.

Frankema, E. and Booth, A.: 2019, *Fiscal Capacity and the Colonial State in Asia and Africa, c. 1850–1960*, Cambridge University Press, chapter Fiscal Capacity and the Colonial State: Lessons from a Comparative Perspective, pp. 1–35.

Galiani, S. and Schargrodsky, E.: 2010, Property rights for the poor: Effects of land titling, *Journal of Public Economics* **94**, 700–729.

Gardner, L.: 2019, *Fiscal Capacity and the Colonial State in Asia and Africa, c. 1850–1960*, Cambridge University Press, chapter New Colonies, Old Tools: Building Fiscal Systems in East and Central Africa, pp. 193–224.

Geloso, V. J. and Salter, A. W.: 2020, State capacity and economic development: Causal mechanism or correlative filter?, *Journal of Economic Behavior and Organization* **170**, 372–385.

Gennaioli, N. and Voth, H.-J.: 2015, State capacity and military conflict, *The Review of Economic Studies* **82**(4), 1409–1448.

Haiti Bureau du representant fiscal: 1927, Annual Report of the Financial Adviser-General Receiver for the Fiscal Year October 1926–September 1927, Evening Post Job Printing Office, Inc.

Haiti Bureau du representant fiscal: 1928, Annual Report of the Financial Adviser-General Receiver for the Fiscal Year October 1927–September 1928, Evening Post Job Printing Office, Inc.

Haiti Bureau du representant fiscal: 1931, Annual Report of the Financial Adviser-General Receiver for the Fiscal Year October 1930–September 1931, Evening Post Job Printing Office, Inc.

Haiti Bureau du representant fiscal: 1933, Annual Report of the Financial Adviser-General Receiver for the Fiscal Year October 1932–September 1933, Evening Post Job Printing Office, Inc.

Haiti Bureau du representant fiscal: 1940, Annual Report of the Fiscal Representative for the Fiscal Year October 1939–September 1940, Port-au-Prince, Haiti: Imprimerie de l'Etat.

Heinl, R. D., Heinl, N. G. and Heinl, M.: 1996, *Written in Blood: The Story of the Haitian People, 1492–1995* (rev. and exp. ed.), Houghton Mifflin Co.

Hornbeck, R.: 2010, Barbed wire: Property rights and agricultural development, *Quarterly Journal of Economics* **125**(2), 767–810.

Irwin, D.: 2017, *Clashing Over Commerce: A History of US Trade Policy*, University of Chicago Press.

Johnson, N. and Koyama, M.: 2014, Taxes, lawyers, and the decline of witch trials in france, *Journal of Law and Economics* **57**(1), 77–112.

Johnson, N. and Koyama, M.: 2017, States and economic growth: Capacity and constraint, *Explorations in Economic History* **64**, 1–20.

Lamoreaux, N.: 2011, The mystery of property rights: A u.s. perspective, *Journal of Economic History* **71**(2), 275–306.

Libecap, G. D. and Lueck, D.: 2011, The demarcation of land and the role of coordinating property institutions, *Journal of Political Economy* **119**(3), 426–467.

Lundahl, M.: 1979, *Peasants and Poverty: A Study of Haiti*, Croom Helm.

Lundahl, M.: 1980, Population pressure and agrarian property rights in Haiti, *Statsvetenskaplig Tidshrift* **83**, 275–283.

Palsson, C.: 2021, Small farms, large transaction costs: Haiti's missing sugar, *Journal of Economic History* **81**(2), 513–548.

Palsson, C.: 2022a, "a whirligig of revolutionary presidents" political stability and foreign investment in haiti, 1910-1920, *Working Paper* .

Palsson, C.: 2022b, Short- and long-run effects of refugee camps: Haiti, 1937–2009, *Working Paper* .

Pierre-Charles, G.: 1965, *La economia haitiana y su via de desarrollo*, Cuadernos Americanos.

Queralt, D.: 2019, War, international finance, and fiscal capacity in the long run, *International Organization* **73**(40), 713–753.

Roorda, E. P.: 1996, Genocide next door: The Good Neighbor Policy, the Trujillo regime, and the Haitian massacre of 1937, *Diplomatic History* **20**(3), 301–319.

Schmidt, H.: 1971, *The United States Occupation of Haiti, 1915-1934*, Rutgers University Press, New Brunswick, N.J.

Smith, M. J.: 2009, *Red and Black in Haiti: Radicalism, Conflict, and Political Change, 1934–1957*, University of North Carolina Press.

Tilly, C.: 1990, *Coercion, Capital, and European States*, Basil Blackwell.

Vega, B.: 1995, *Trujillo y Haiti* (vol. 2: *1937–1938*), Fundación Cultural Dominicana.