# Selling Sovereignty: International Coercion, Debt Diplomacy, and Land Transactions 

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#### Abstract

What if countries cannot repay their loans to other countries? Our study re-evaluates debt decisions in two important ways. First, we consider a debt management strategy yet to be considered in political economy research: repaying sovereign loans with land. Second, since our theoretical framework focuses on the distributional consequences of debt management for domestic groups, we model the interdependencies across policy choices. Using new data on land transactions, existing data on default, debt relief and austerity, and simultaneous equation estimation, we find that countries with influential financial groups address debt problems through austerity and land transactions to prevent default. In contrast, governments influenced by labor groups are less likely to implement austerity measures and tend to avoid land deals - but conversely are more likely to default. Our study sheds light on how debtor governments attempt to protect political sovereignty in a context of international pressure and debt diplomacy.


Over the last decade, developing countries increased their debt obligations by borrowing from new creditors, such as China, Brazil, Russia, and Saudi Arabia. Despite new sources of credit, loans still require repayment. Countries consider alternative strategies for dealing with mounting debt problems. Some countries 'tighten their belt' by implementing austerity policies to repay debt. For example, when Kenya had difficulty servicing debt obligations to China in 2017, the Kenyan government reigned in public spending to meet repayment obligations (Miriri, 2017). Austerity may produce political backlash, so some governments instead lobby for debt relief. For instance, Cambodia received $\$ 100$ million in debt relief from China in 2016 (Penh, 2016). If relief is not available and austerity is unattractive, governments may default on their debt obligations. For example, Zambia defaulted on its Chinese loans in 2020. This prompted speculation that it would need to hand over Kenneth Kaunda International Airport or the national electricity supplier, Zesco to China (Steinhauser, 2020).

Austerity, relief, and default are not the only options to deal with debt. Consider Sri Lanka, which obtained a Chinese loan to build the deep-sea port Hambantota. Despite the proximity to the world's busiest shipping lanes, the port drew only 34 ships in 2012, as it could not compete with Singapore's port. Without the expected port revenue, debt repayments related to the port burdened government finances. In light of this situation, the new Sri Lankan government made a deal with China: for a total fee of $\$ 1.12$ billion and some debt relief, a Chinese state-owned firm obtained a 99-year lease for the port in 2018. This land transaction prompted warnings that China's loans could lead to a "debt-trap" where China uses debt diplomacy to gain strategically important territory (Abi-Habib, 2018, A1).

The Sri Lankan example raises two questions: First, do states regularly use land to settle debt issues? The Sri Lankan case received media attention because of the apparent relationship between China's lending and the port acquisition, but it is not clear whether this case represents a larger phenomenon. Second, how are the four debt policy options of austerity, debt relief, default and land deals interrelated? The Sri Lankan government implemented its
land deal with China to receive debt relief and to avoid default and austerity. In sum, not only do states have various options to address debt, these options are interdependent.

In this context, our research question is straightforward: What explains the choice of debt management strategies by developing countries? We argue that each of the four debt management strategies has distinct distributional consequences for domestic groups. For example, defaulting on debt would hurt those holding financial assets because default increases interest rates and restricts access to capital. Consequently, finance may favor land deals to avoid default. Conversely, labor would be more favorable of default given this group's lack of financial assets. This is the case particularly if default reduces the likelihood of handing over territory to foreign powers, which workers value for reasons of sovereignty and national identity. Given these conflicting societal interests, we suggest that the relative political influence of these distinct interest groups determines which policy option the government pursues.

Connecting to the opening examples, Kenyan President Uhuru Kenyatta is a wealthy entrepreneur, with deep connections to the financial community (Nsehe, 2017). Thus, austerity was preferred to default. Conversely, the leadership in Zambia relies on trade unions to support the ruling party, the Patriotic Front (Akwetey and Kraus, 2007). As a result, default was more acceptable compared to the alternative choices. Finally, the Sri Lankan example provides interesting within-case variation. President Mahinda Rajapaksa signed the original loan with China, in attempt to enrich his home region and with the support of the Port Workers Union. Maithripala Sirisena took power in 2015 and signed the port lease agreement with China (Abi-Habib, 2018, A1). Mahinda Rajapaksa's brother, Gotabaya Rajapaksa, is currently president. With the support of trade unions, he initially threatened to cancel the lease-deal with China, though Rajapaksa and Sirisena formed a political alliance which has stalled any progress on that front (Srinivasan, 2020).

While these examples are suggestive that domestic groups' influence debt management, we seek to test this argument systematically. We analyze four possible policy options to address debt problems: austerity, debt relief, default, and land transactions. To do so, we
create a new dataset capturing land transactions between sovereigns from 2000 to 2018. We subsequently model these four dependent variables in a system of equations that allows us to estimate the four outcomes simultaneously while incorporating interdependencies. Our findings suggest the following: states with more financial influence will address debt problems through austerity and land transactions. States with more labor influence address debt problems through default, while austerity and land transactions are less likely.

Our study contributes to the existing literature in three important ways. First, most debt research focuses on a single management strategy in isolation. For instance, the debt literature often considers whether debtor governments default or not. In contrast, we argue that these different results - austerity, default, debt relief, and land deals - are part of the portfolio of possible outcomes that are considered by debtors and creditors simultaneously. Our argument speaks directly to research concerned about the distributional consequences of debt and debt policy (Ballard-Rosa, Mosley and Wellhausen, 2020; Ballard-Rosa, 2016; Campello, 2013; Bi and Traum, 2012; Flores-Macías and Kreps, 2013; Flores-Macías and Kreps, 2017; Walter, 2016; Frieden and Walter, 2017; Ahlquist, Copelovitch and Walter, 2020).

In addition, little research exists examining the possibility of repaying debt with land. While much work has examined involuntary land transactions in the context of war and international conflict (Krasner, 2001; McLaughlin Mitchell and Hensel, 2007; Owsiak and Mitchell, 2017, Vasquez and Henehan, 2001), we know little about land deals outside of military coercion. As we discuss in more detail below, the Sri Lanka example or historical examples such as the United States' purchases of Alaska, Florida, and Louisiana are not isolated incidents. Land deals are pervasive. Yet, the political economy literature is mostly silent on these cases. Thus, the frequent coverage of "debt-trap diplomacy" in newspapers has yet to be matched with rigorous academic research on the subject of land deals between countries. And while China's Belt and Road Initiative (BRI) is an important component to the changing nature of sovereign lending, land transactions are not limited to China. As we
demonstrate below, transactions are implemented by many countries and these purchases vary overtime.

Finally, our findings have implications that extend beyond debt politics. Land transactions have considerable impact on security. Consider Djibouti where the U.S. Navy maintains Camp Lemonnier. This camp was leased by Djibouti to the United States in 2001, along with the right to use the neighboring airport and port facilities. The base supports 'Operation Enduring Freedom' and is home to 4,000 personnel and a fleet of drones. In 2014, the U.S. began a $\$ 1$ billion upgrade of Camp Lemonnier. However, in 2016 - shortly after obtaining loans from China - the Djiboutian government granted China land for a base as well. Importantly, the Chinese base is located only four miles from the U.S. base. In 2018, the U.S. issued a notice to airmen reporting instances of laser attacks against pilots flying near the base, though the Chinese Defense Ministry called the accusations "untrue" (Browne, 2018). More land transactions may increase this type of global power competition and call into question the selling country's sovereignty.

## 1 The Political Economy of Debt and Land

Leaders use credit to stay in power (Morrison, 2009; Clay and DiGiuseppe, 2017). However, how do states deal with debt? A large literature has examined three possible debt management strategies governments can pursue when facing with financial challenges: default, debt relief, and austerity.

Why do some countries default and other not? Some scholars focus on reputation concerns, as default might exclude countries from capital markets (Tomz, 2007). Other scholars point to the "democratic advantage," which suggests that democracies are more likely to repay creditors (Schultz and Weingast, 2003; Ballard-Rosa, Mosley and Wellhausen, 2020). The presence of checks and balances implies multiple veto players acting as a constraint on governments seeking to default (McGillivray and Smith, 2008; Saiegh, 2009; Pond, 2018;

Van Rijckeghem and Weder, 2009).
Who those veto players are should make a difference (Campello, 2015). Stasavage (2011) shows that elites with ties to the financial market have incentives to pressure leaders to honor debt obligations. Credit downgrades and default would hurt finance, while the consequences of repayment would be borne by the entire society. Consequently, the presence of an influential financial elite reduces the likelihood of government default on its debt. Consistent with this, Curtis:2015tv analysis of Iceland's debt crisis finds that unemployed individuals and those with investments opposed and supported debt repayment to external creditors, respectively.

If states do not default, how do governments generate more revenue to repay? State may implement austerity measures, where ideology is an important correlate (Nelson, 2014). Relative to left-leaning governments, fiscally conservative leaders in developing countries have been shown to implement reforms against domestic resistance, sometimes with the assistance of foreign creditors (Vreeland, 2003).

Alternatively, governments can lobby for debt relief (Busby, 2007). Creditors are at times willing to provide debt relief, in particular if it helps to contain material losses to creditors. It might be in the interest of creditors to prevent a fully-fledged debt crisis, as these are costly for its citizens that own assets and investments in the debtor nation (Copelovitch, 2010). In addition, creditors are concerned about contagion effects that occur when a debt crisis spreads from one country to the next (Brooks, Cunha and Mosley, 2015; Van Rijckeghem and Weder, 2003; Van Rijckeghem and Weder, 2001). The more countries are affected, the higher the expected costs of bailout. Creditors may prefer providing debt relief to individual countries ahead of time instead of bailing out multiple debtor governments at a later stage (Bouvet, Brady and King, 2013).

There are two shortcomings in the existing debt literature. First, while governments have several possible strategies available to respond to debt problems, existing work focuses on a single strategy in isolation. For instance, the debt literature only considers whether
debtor governments default or not. For example, DiGiuseppe and Shea (2019) analyze the domestic political causes of debt restructuring. While the authors control for debt relief and default, they do not model these policies as possible alternative outcomes to restructuring. In contrast, we argue that these different policies are part of the portfolio of possible outcomes that are considered by debtor governments simultaneously. Analyzing each policy option in isolation ignores the crucial trade-offs between these strategies.

The second shortcoming concerns the menu of policy choices available to governments. Scholars have largely ignored one important option: land transactions. Debt scholars have mentioned in passing the possibility of territory as a debt solution. For example, Shea and Poast (2020, p. 406) note that "beyond the extreme measures of selling land, the state can raise taxes and cut spending in order to prioritize debt repayment." Little research exists examining the possibility of repaying debt with land. In the context of frequent coverage of "debt-trap diplomacy" in newspapers, however, we argue that repaying loans with land is a fourth potential debt management strategy, which needs to be included in the analysis.

Territory is a central correlate to the existing conflict literature. There are roughly 90 ongoing territorial disputes in the world (Central Intelligence Agency, 2018). Existing scholarship shows that these disputes are more likely to escalate to conflict than other issue disputes (Vasquez and Henehan, 2001). In addition, conflict involving territorial disputes last longer, suggesting that states are more resolved to fight over territorial issues (Gibler, 2017). Yet, we observe many cases of states ceding land away without conflict. For example, Egypt recently transferred two islands - Tiran and Sanafir - to Saudi Arabia (Walsh, 2016).

The existing literature on "voluntary" land transactions lacks systematic analysis. The empirical strategy of most analyses related to land transactions has focused on single case studies (Bunte et al., 2018). The aforementioned Sri Lankan case or the U.S. offer to purchase Greenland from Denmark are interesting, but limit our general inferences. Without systematic cross-country data on land transactions it will remain a challenge to identify the causal factors that underpin governments' decision to cede territory to foreign creditors. In
sum, there is a need for a theoretical framework that integrates governments' decisions for (or again) repayment, debt relief, default, and land transactions. Since governments simultaneously decide among these options, and since these options are interdependent, we must analyze governments' choice among the four possible policies jointly. In the following section, we propose such a framework.

## 2 A Theory of Debt and Land Transactions

Our theory builds off the political economy literature on trade (Milner, 1999; Owen and Johnston, 2017), capital inflows (Avelino, Brown and Hunter, 2005, Pandya, 2016), and debt (Bunte, 2019). We begin our argument with the assumption that leaders - in both democracies and autocracies - want to maintain power. Office-motivated politicians respond to key constituents to keep power (Mattes, Leeds and Carroll, 2014). As a result, the preferences of key constituents influence government decisions on debt.

As a simplifying assumption, we focus on two sets of constituents: Finance and Labor. We conceptualize Finance as a group comprised of actors that are well-connected and integrated into the world economy. We assume most capital owners - whether they be intangible assets such as money, stocks, or bonds, or tangible assets such as manufacturing sites belong to this class. Their income is consequently generated from returns on investments. Financial income depends on the continued existence of physical capital stock, as well as the presence of a market for inputs and outputs. For this reason, finance prefers that government policies do not interfere with the continued integration of the domestic economy with the international economy. In sum, we assume that Finance prefers government policies that increase capital flows and maintain stable currency exchange.

In contrast to Finance, we conceptualize Labor as actors who do not obtain significant income from either intangible assets or fixed capital but instead are forced to sell their labor. The income of this group is thus dependent on wages, as well as government spending such
as employment initiatives, pensions, or welfare. We expect that government policies may have heterogenous effects on different individuals within labor. For example, individuals working in export orientated industries may benefit from more liberal trade policies than individuals working in import-competing industries. Given that individuals within labor have heterogenous preferences over government policies, we expect that labor unions and laborbased political parties are organized around non-material preferences to maintain cohesion and increase influence. Specifically, we expect labor groups to organize around ideas of a national identity, particularly in context of populist tendencies (Murillo, 2001).

The Interest Groups' Preferences across Four Policy Options We focus on four potential policy options for managing debt. We argue that governments will implement the debt management strategy preferred by the politically dominant interest group. However, what are the preferences of Finance and Labor across these policy options? We combine the characteristics of the interest groups with the characteristics of the policy options to derive the respective distributional consequences, and thus preferences.

Austerity. If revenues fall short, meeting repayment obligations to foreign creditors is difficult. In this situation, governments can choose to implement austerity measures, such as reducing public employment, cutting pension payments, or limiting spending on welfare state programs such as employment insurance and worker training measures.

Austerity negatively affects Labor. Workers are primarily hurt by governments' spending reductions or increased VAT during times of crisis. Consequently, we expect labor to be opposed to austerity policies that prioritize repayment of external creditors over their own welfare. In contrast, we expect Finance to push for reforms that prioritize repayment. Since their income depends on continued integration with the world economy, they have an interest for their government to meet repayment obligations. Austerity measures should have minimal impact on Finance's income.

Consistent with our argument, survey evidence from Iceland suggests that unemployed
citizens or those at risk of losing a job are less likely to support repayment than those with more secure employment. Furthermore, richer citizens, as well as individuals who value capital mobility, are most likely to support repayment (Curtis, Jupille and Leblang, 2015). Citizens in weaker economic positions and the unemployed opposed repayment of loans to external creditors. Conversely, citizens with investment assets reported to be in favor of austerity measures to ensure repayment, as they worried about the inflationary effects of either printing money for repayment or a currency devaluation that would follow default. In general, leaders closely consider the domestic interests related to austerity (Walter, 2016).

Debt Relief. An alternative strategy to deal with insurmountable debt service is to lobby for debt-relief. Debt would relief offers obvious benefits to debtor governments by relieving or reducing the immediate need to raise resources for repayment. By providing debt relief, creditor governments can help create new investment opportunities in the debtor nation, which in turn may result in contracts for private companies from the creditor countries (Bunte, 2018). Second, debt relief also helps contain material losses to creditors. For instance, creditors would like to avoid debt crises, as these are costly for its citizens that own assets and investments in the debtor nation (Copelovitch, 2010). In addition, creditors are concerned about contagion effects may prefer providing debt relief to individual countries instead of bailing out multiple debtor governments at a later stage (Bouvet, Brady and King, 2013).

Nevertheless, creditor governments may only be willing to provide debt relief to debtor governments in certain circumstances. It may be the case that only debtor governments who are ideologically aligned with the creditor are likely to obtain debt relief. Similarly, debtors may be expected to "repay" creditor governments in non-monetary form, such as favorable votes within the United Nations or similar international bodies. However, neither of these conditions has any material bearing on the interests of Labor and Finance. Consequently, we expect both societal interest groups to be in favor of debt relief.

Default. If austerity measures are not an option and debt relief is not available, default-
ing on external debt is a third strategy debtor governments can pursue. However, default has serious consequences by (temporarily) removing its access to international markets. Furceri and Zdzienicka (2012) estimate that default reduces economic output by ten percent after eight years, an effect that is larger than banking or currency crises. Further, defaults are contagious and pose a threat to regional financial stability (Brooks, Cunha and Mosley, 2015). Nonetheless, default does provide some benefits. Refusing to repay allows leaders to reallocate resources away from debt payments and towards social services. For example, Ballard-Rosa $(\overline{2016})$ finds that some autocrats will default to free up fiscal resources to manage food price crises.

Given these distributional consequences, we expect financial elites to oppose default. The inability to access international capital markets and increased uncertainty following default all represent negative consequences for Finance. In contrast, Labor may be more inclined to consider default as an acceptable debt management policy. While the economic turmoil of default is likely to also affect employment opportunities and wages, workers might prefer default to austerity. After all, the consequences of repayment would be borne by the majority of the population - i.e. workers - while the consequences of default are likely concentrated within the financial elite.

Much evidence supports the view that Finance and Labor have diverging preferences concerning default. Stasavage (2003) shows that a government's decision to default on bonds negatively affects those who own public debt while non-default increases the burden of taxation for others. In later work, Stasavage (2011) argues that the presence of an influential financial elite reduced the likelihood of government default on its debt. Kim (2013, p. 7) suggests that poorer voters are less affected by the negative consequences of default, and thus societies with poorer median voters are more likely to default.

Land Deals. Finally, leaders can use land to solve debt problems in several ways. Land transactions raise revenue to pay debt obligations. For example, the United States' purchases of Louisiana, Florida, and Alaska were a function of France, Spain, and Russia's respective
debt problems. Land transactions can also work with other debt policy options. For example, Sri Lanka's port deal with China not only generated revenue for the government, but also helped Sri Lanka secure debt relief from China.

Given these characteristics, we expect financial elites to push for reforms that prioritize repayment, irrespective of whether this repayment occurs in monetary terms or via land deals. If a land deal decreases the likelihood of default, we assume that Finance would be willing to cede some land if that is the price for avoiding default. In addition, land transactions to foreign powers - such as in the case of Sri Lanka - often result in subsequent investment from companies of the creditor country. Such investment would bring in new technology and investment into the economy, which is beneficial to existing investments in the country.

Labor, on the other hand, will generally oppose land transactions. While some within labor may eventually benefit from international land investments, we assume that majority within labor will perceive the investment, and the corresponding technological import, as a substitute to labor. Rather than creating opportunities for local people, land deals have been found to be disadvantageous to Labor. Selling land diminishes land access for locals, eradicates local businesses, and causes environmental damage (Cotula, 2009). These projects often face local resistance led by local labor groups. For example, after receiving billions of dollars in loans from China to build a dam, Mozambique provided land to Chinese companies and individual settlers for agricultural development (Brautigam, 2015). In one instance, local farmers organized and challenged the transfer of territory to the Wanbao company. They succeeded in halting operations in that location, but the company simply received another tract of land with Mozambique's support (Wise, 2018).

Land transfers, such as the ones in Mozambique, are often designed to help developed countries stabilize their food prices. However, the projects can produce negative externalities for local workers. First, local worker lose land rights as a result of these land deals. In many countries, land titling is informal and ownership is defined by past use of land. Governments take advantage of this ambiguities when distributing land to buyers. In addition, land
investment projects, particularly those funded by China or South Korea, bring outside labor to work the land and force people off the land (Visser and Spoor, 2011; Borras Jr and Franco, 2012). As a result, locals lose income with no ability to work their land and no ability to use land ownership as collateral to obtain credit. In addition, with land projects designed to export food back to developed states, labor may face higher food prices and diminished purchasing power. Without organization and government support, large-scale land investment projects will have detrimental effects on local labor (Li, 2011).

We also expect that labor to internalize the non-material benefits of public land, such as ideas of a national identity and populism. Individuals within labor may benefit differently from globalization and international investment. In order to build strong group coalitions, labor groups turn to social partnerships (Campbell and Hall, 2009). We expect that these social partnerships will be based on ideas on nationalism. Building off of Krasner (2001, p. 27), sovereign debt constitutes a promise by the borrower to relinquish some control over fiscal autonomy in order to repay debt obligations. Labor is likely to view handing over land to foreign powers and firms as an infringement of their sovereignty and attack on national identity. Consequently, we expect labor to be opposed to land deals, and instead prefer its government to default on loan obligations.

Table 1: Expected Preferences of Interest Groups over Debt Management Strategies.

|  | Finance | Labor |
| :--- | :---: | :---: |
| Austerity | Support | Oppose |
| Debt relief | Support | Support |
| Default | Oppose | Support |
| Land Deal | Support | Oppose |

Empirical Implications Table 1 summarizes the preferences of Labor and Finance across the four potential debt management strategies. In light of conflicting preferences for at least some policy options, which debt management strategy will governments pursue? Our expectation is straightforward: office-motivated politicians' incentive to listen to interest
groups (and implement their preferred policies) corresponds to the respective groups' degree of political influence. As a result, our theory yields four testable empirical implications:

As Finance's influence increases, governments are more likely to impose austerity; as Labor's influence increases austerity measures are less likely.

As Finance's influence increases, governments are more likely to default; as Labor's influence increases default is less likely.

In comparing countries, governments will prefer more debt relief over less, irrespective of the political importance of Finance and Labor.

As Finance's influence increases, governments are more likely to dell land; as Labor's influence increases selling land is less likely.

## 3 Empirical Analysis

To test our hypotheses, we examine creditor-debtor-year observations with available data from the year 2005-2018. We focus on this dyadic structure because we want to capture the relationship between bilateral loans and bilateral land transactions. Our sample includes 33 creditor governments, who provided 6014 loans to a total of 1383 recipients. China provided the most loans (768) and the United States provided 323.

With these data, our goal is to simultaneously estimate decisions across four possible debt policies. More specifically, we want to identify an equilibrium characterizing the decisions by governments with respect to all four debt management strategies. In this context, we want to account for the interdependency across the strategies. For example, the government's decision-making process concerning default should take into consideration the government's decision to implement austerity measures, to seek debt relief, or to sell land; while the decision to sell land should also depend on the government's decision to default, seek debt relief, or implement austerity measures.

We model these four decisions and their interdependence using a nonrecursive structural
simultaneous equations model. It involves four structural equations - one for each debt management strategy - while incorporating feedback loops, that are paths in both directions between one or more pairs of endogenous variables. The equation takes the following form:

$$
\begin{aligned}
& \text { Austerity }_{i}= \beta_{1}{\text { Debt } \operatorname{Relief}_{i}+\beta_{2} \text { Default }_{i}+\beta_{3} \text { Land Deal }_{i}} \\
&+\beta_{4} \text { Finance }_{i}+\beta_{5} \text { Labor }_{i}+\beta_{6} \mathrm{X}_{i}+\beta_{7} \mathrm{Z}_{1}+\epsilon \\
&{\text { Debt } \text { Relief }_{i}=} \beta_{8} \text { Austerity }_{i}+\beta_{9} \text { Default }_{i}+\beta_{10} \text { Land Deal }_{i} \\
&+\beta_{11} \text { Finance }_{i}+\beta_{12} \text { Labor }_{i}+\beta_{13} \mathrm{X}_{i}+\beta_{14} \mathrm{Z}_{2}+\epsilon \\
& \text { Default }_{i}= \beta_{15} \text { Austerity }_{i}+\beta_{16}{\text { Debt } \text { Relief }_{i}+\beta_{17} \text { Land Deal }_{i}} \\
&+\beta_{18} \text { Finance }_{i}+\beta_{19} \text { Labor }_{i}+\beta_{20} \mathrm{X}_{i}+\beta_{21} \mathrm{Z}_{3}+\epsilon \\
& \text { Land Deals }_{i}= \beta_{22} \text { Austerity }_{i}+\beta_{23}{\text { Debt } \text { Relief }_{i}+\beta_{24} \text { Default }_{i}}+\beta_{25} \text { Finance }_{i}+\beta_{26} \text { Labor }_{i}+\beta_{27} \mathrm{X}_{i}+\beta_{28} \mathrm{Z}_{4}+\epsilon
\end{aligned}
$$

where $X$ is a set of control variables (GDP p.c., Democracy, and bilateral debt stock) that are common across equations and $Z$ are exogenous variables unique to specific equations.

OLS estimation of an equation that contains an endogenous explanatory variable generally produces biased and inconsistent estimators. For each individual equation, fundamental assumptions of OLS are violated as the error terms are correlated with endogenous variables. In addition, the errors will be correlated across equations, as some of the explanatory variables are dependent variables of other equations in the system.

We address these challenges by estimating a system of structural equations approach to produce consistent estimates and generalized least squares (GLS) to account for the correlation structure in the disturbances across the equations. Following Zellner and Theil (1962), estimation involves three steps. The first step develops instrumented values for all endogenous variables using predicted values from a regression of each endogenous variable on all exogenous variables in the system. The second step creates a consistent estimate for each covariance matrix of the equation disturbances. These estimates are based on the residuals from a 2SLS estimation of each structural equation. Lastly, we conduct a GLS estimation
using the covariance matrix estimated in the second stage and with the predicted values in place of the right-hand-side endogenous variables.

In order to be able to estimate the structural equation coefficients, the equations must be identified. We constructed the structural equation model specifically in such a way that both the order as well as the rank conditions are satisfied. The order condition is a necessary, but not sufficient, condition for identification. To prevent an under-identified model, the number of variables (endogenous and exogenous) in the model excluded from the equation under consideration, $k$, cannot be smaller than the number of endogenous variables in the model, $m$, minus one. In our case, each equation has $m=3$ endogenous variables, while the number of variables in the system excluded from the equation under consideration is $k=3$. Consequently, $k>m-1$. This is true for each equation in the system. According to the order condition, the model does not suffer from under-identification.

The rank condition is a necessary and sufficient condition (Wooldridge, 2001). It investigates whether two or more equations are linearly dependent on each other. This would be the case if the sum of two equations would equal a third equation in the model. In this case it is impossible to identify all structural parameters. In our case, the system contains a total of nine variables, four endogenous variables (austerity, debt relief, default, and land deals) as well as seven exogenous control variables. To illustrate the process of checking whether the rank condition is met, we first create a matrix that - for each equation - indicate which of the nine variables that are included (marked with 1 ) and which that are excluded (marked with 0 ) from the equation. For our system we receive the following matrix:

|  | Austerity | Debt <br> Relief | Default | Land <br> Deals | Influence <br> Finance | Influence <br> Labor | $X_{1}$ | $X_{2}$ | $X_{3}$ | $Z_{1}$ | $Z_{2}$ | $Z_{3}$ | $Z_{4}$ |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Equation 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 |
| Equation 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 |
| Equation 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 |
| Equation 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 |

In order to check the rank condition for the first equation, we delete the first row and collect the columns for those variables of the first equation that were marked with zero. This
results in the following:

|  | $Z_{2}$ | $Z_{3}$ | $Z_{4}$ |
| :--- | :---: | :---: | :---: |
| Equation 2 | 1 | 0 | 0 |
| Equation 3 | 0 | 1 | 0 |
| Equation 4 | 0 | 0 | 1 |

The rank condition would not be met (and thus the model would not be identified) if either this matrix contains less than $T-1$ rows, where $T$ is the number of equations, or if it contains $T-1$ columns where all elements are zero. In our case, we have three rows and three columns, and none of them contain only zeros. Consequently, equation 1 is identified. Since the remaining three equations exhibit similar features, each the model is identified.

### 3.1 Data

We capture the four debt management strategies - austerity, debt relief, default, and land deals - with four binary variables. Beginning with austerity, the outcome equals one if general government consumption expenditure declines by ten percent, following Arias and Stasavage (2019). This captures instances where governments decrease spending in order to meet debt obligations. The underlying data come from the World Development Indicators published by the World Bank.

Next, default data is taken from the Bank of Canada's Database of Sovereign Defaults (Beers and Nadeau, 2015). While there are alternative measures of default available, this dataset has two advantages. First, the temporal and cross-sectional coverage for the years 2000-2018 is better than alternative sources. Second, and more importantly, the data distinguishes between default to private creditors and default to official creditors. While financial distress in general may prompt leaders to seeks additional revenue sources to stake off insolvency, we expect that liabilities owed to other states increases international pressure for states to address debt problems. The measure equals one if a government is in default with one or more official creditors, including bilateral creditor governments or multilateral creditors
such as the World Bank and IMF.
Then, data on bilateral debt relief is obtained from the OECD's debt statistics. It includes all instances of debt relief granted by OECD countries, both in the context of multilateral debt relief initiatives by the Paris Club as well as bilateral debt cancellation programs. In addition, we coded every known instance of debt relief provided by BRIC creditors. The dummy for debt relief is dyadic in nature and equals one if a particular creditor government provided at least some debt relief to a specific debtor in a certain year.

Finally, obtaining data on land transactions that occurred outside of international conflict presents a particular challenge. Existing studies related to land transactions outside of military coercion are often limited to single country studies. For example, Bunte et al. (2018) examine all concessions that the Liberian government has provided to foreign investors, while land grabs studies focused on single sellers (Xu, 2018; Hall, 2011).

Our starting point is the Land Matrix database (Land Matrix Global Observatory, 2018). The data are based on newspaper articles, non-governmental reports, and other news sources. Importantly, every project in this database has undergone ground verification by non-governmental organizations associated with the International Land Coalition (Anseeuw et al., 2012). In addition, we have verified a random sample of the observations with independent news sources.

Overall, the dataset includes information on over 5,000 land transactions from 1893. We limit the scope of the analysis in several ways. First, we only consider cross-national transactions, so domestic transactions are omitted. Second, we only include transactions where negotiations are formally concluded and the project has not been since abandoned; any ongoing negotiations are not included. Third, we limit the data to outright purchases and long-term leases (longer than 25 years) ${ }^{1}$ Finally, we focus on land transactions where governments are the seller and the buyer is also a government entity. This results in 1,234 land transactions.

[^0]While our theoretical framework focuses on why debtor governments sell territory, we do examine whether the characteristic of the buyer matters. Specifically, land transactions that involve buying governments may be different than transactions involving private investors. Land Matrix does not differentiate between land obtained by government entities, such as state-owned enterprises, or private investors. For this reason, we hand-coded the ownership structure of buyers and sellers of every single transaction recorded by Land Matrix. Specifically, we analyzed whether the buyers and sellers were sovereigns or private companies. Our coding scheme counted transactions as conducted by sovereigns if the buyers were entities majority owned by government bodies or by a state-owned enterprise. This resulted in ownership information for 1,624 entities noted in the Land Matrix data. 2 Of this sample, 235 companies ( 15 percent) were majority owned by government entities.

Independent Variable: Political Influence of Finance and Labor The influence of Finance and Labor affect debt policy. We argue that politicians will listen to these interest groups only when two conditions are met. First, the various actors making up the group have the ability to overcome collective action problems. Second, even if the group is capable of consolidating their demands, the group must also be important enough for politicians to actually pay attention to what they are saying.

To measure the influence of the domestic economic elites and the general population, we replicate the conceptualization and measurement proposed by Bunte (2019). To operationalize the political influence of the financial elites, he interacts bank concentration (to proxy for the ability to overcome collective action problems) by domestic credit provided to the overall economy (to capture the importance of financial elites). Conversely, to measure the influence of the general population, he interacts the skill level of workers (again, a proxy for their ability to organize) with the unemployment rate (a measure of how replaceable, and thus important, workers are).

[^1]Control Variables To account for confounding, we include several control variables appear in each equation. Given the four equations we estimate we have to strike a balance between the number of controls and the model's ability to converge, as well as the requirements for identification. Consequently, we restrict ourselves to the following controls. First, we include several control variables in each equation. These include GDP per capita to account for differences in the level of development across debtors, which may affect the domestic influence of certain interest groups and the ability of states to repay loans. Next, we include a debt burden measure, which measure how much debt a state owes to its official creditors. Both of these measures are taken from the World Bank's World Development Indicators.

We also control for regime type using the binary measure of democracy provided by Boix, Miller and Rosato (2013). Democracy is a key correlate in sovereign debt research and democratic institutions may mitigate or attenuate the effect of certain domestic groups. We rely on the binary measure of democracy to ease conditional inferences (see below), but our results are robust to alternative measures, including Polity and v-Dem's Polyarchy measure of democracy. Finally, we include time splines into each equation to account for temporal dependence.

We also include equation-specific variables - which should not be affected by other covariates in the equation - for identification purposes. For the austerity equation, we include a dummy indicating whether legislative or presidential elections were held based on data from the World Bank's Database on Political Institutions. We expect that austerity is more difficult to implement in election years. In the equation for default, we expect that defaults are less likely to occur if a debtor has access to natural resource wealth. Therefore, we control for resource rents as a percentage of GDP (data from World Bank). With respect to debt relief, we control for economic growth in the creditor. If a creditor is experiencing more growth it should be more likely to forgive debt obligations. Again, this data is drawn from the World Bank. Last, in the equation for land transactions, we control for food imports of
the debtor as a percentage of all imports. We expect that states dependent on foreign food sources will be less willing to give up potential agricultural land. This expectation builds off of the work by Ballard-Rosa (2016) on the relationship of food prices and debt. Data are drawn from the World Bank.

## 4 Results

The main findings are shown in Table 2 and illustrated in Figure 1$]^{3}$ The results show that the influence of Finance and Labor lead to divergent debt management strategies. With increasing political influence of Finance, we find governments increasingly likely to implement austerity and engage in land transactions, while trying to avoid default. Conversely, as the political power of the Labor increases, governments are likely to pursue different set of strategies: default is more likely, while land transactions and austerity measures to facilitate repayment become less likely.

[^2]Table 2: Simultaneous Estimation of Debt Strategies

|  | Austerity | Land Deal | Default | Debt Relief |
| :--- | :---: | :---: | :---: | :---: |
| Finance | 0.040 | 0.017 | -0.190 | 0.080 |
| Labor | $(0.007)$ | $(0.009)$ | $(0.003)$ | $(0.018)$ |
|  | -0.097 | -0.039 | 0.041 | -0.141 |
| Austerity | $(0.005)$ | $(0.015)$ | $(0.004)$ | $(0.031)$ |
|  |  | -0.328 | 0.077 | -1.451 |
| Land Deals |  | $(0.151)$ | $(0.020)$ | $(0.311)$ |
|  | -0.226 |  | -0.028 | 0.883 |
| Default | $(0.250)$ |  | $(0.020)$ | $(0.233)$ |
|  | -0.060 | 0.057 |  | -0.030 |
| Debt Relief | $(0.030)$ | $(0.027)$ |  | $(0.040)$ |
|  | 1.056 | -0.479 | -0.033 |  |
| Debtor Elections | $(0.257)$ | $(0.223)$ | $(0.018)$ |  |
|  | 0.029 |  |  |  |
| Oil Rents | $(0.005)$ |  |  |  |
|  |  | -0.024 |  |  |
| Creditor Economic Growth |  | $(0.006)$ |  |  |
|  |  |  | $(0.003)$ |  |
| Debtor Agricultural Imports |  |  |  | $(0.078$ |
|  |  |  |  | -0.107 |
| Debtor GDP per cap | -0.042 | -0.019 | -0.134 |  |
|  | $(0.009)$ | $(0.009)$ | $(0.004)$ | $(0.021)$ |
| Debtor Democracy | -0.003 | -0.000 | -0.057 | -0.000 |
|  | $(0.005)$ | $(0.004)$ | $(0.003)$ | $(0.006)$ |
| Debtor Debt Stock | -0.104 | -0.017 | -0.215 | -0.132 |
|  | $(0.009)$ | $(0.016)$ | $(0.003)$ | $(0.032)$ |
| Constant | 0.075 | 0.009 | 0.113 | 0.088 |
|  | $(0.016)$ | $(0.016)$ | $(0.010)$ | $(0.030)$ |
|  |  | $\mathrm{N}=131888$ |  |  |

Figure 1: Estimated Effects of Domestic Groups on Debt Policy


These results are mostly consistent with the hypothesized mechanisms outlined above. We argued that Finance would be in favor of austerity measures to avoid disrupting its access to international capital markets, while Labor would like to avoid such measures given its reliance on government programs. Conversely, we argued that Labor would be in favor default if it would prevent austerity measures or land deals, while Finance would be opposed to such decisions. Lastly, we argued that Labor would be opposed to land deals for fears of losing sovereignty, while this price might be acceptable to Finance if it means that the government does not have to default.

The only divergence from our expectations relates to debt relief. While Finance increases debt relief, Labor's influence shows a negative effect on debt relief. These results may be a function of debt relief being a decision of creditors, not debtors.

In sum, these analyses suggest that heterogenous consequences of various debt management strategies for different societal strata might explain why some governments are
engaging in land transactions, while others are not. And these strategies are highly dependent on each other. For example, the results in Table 2 suggest that default decreases the need for austerity, but is associated land deals. Conversely, land transactions lowers default rates, suggesting that the timing of the strategies is important.

## 5 Conclusion

When faced with repayment obligations, why do some states implement austerity, while others lobby for debt relief, default on their obligations, or sell land to settle outstanding debt? We argue that each of the four debt management strategies has distinct distributional consequences for domestic groups. Since our theoretical framework is based on the trade-offs implicit in different policy choices, we modeled the interdependencies across debt management strategies in our empirical analysis. We find that countries with influential financial groups tend to address debt problems through austerity and land transactions to prevent default. In contrast, governments influenced by labor are less likely to implement austerity measures and tend to avoid land deals - but conversely are more likely to default.

Our work makes several contributions. First, our theoretical framework is the first to explicitly analyze multiple debt management strategies simultaneously. Governments do not decide for or against default in isolation. Instead, a decision against default might imply a decision in favor of austerity measures to repay creditors, the choice to sell land, or the hope to lobby for debt relief. These possible debt management strategies are part of a choice set that must be analyzed jointly to properly capture the interdependencies among these policies. Our theoretical framework does just that.

Second, while much work has examined the determinants of austerity policies, default, and debt relief, we are the first to integrate land transactions into the analysis. While existing work has examined instances of land changing hands in the context of war, we must account for the increasing frequency of land deals outside of military coercion. We provide
a theoretical explanation for the conditions under which so-called debt-trap diplomacy may occur.

Third, we make use of innovative independent variables. Social scientists claim that institutions explain some economic or political outcome. This approach implicitly holds preferences constant to examine how the variation in institutions aligns with differences across outcomes. We acknowledge that this approach has virtue. However, institutions do not change much over time. This makes it difficult to explain policy choices concerning default, repayment, or debt relief, as they tend to change more quickly than institutions. As institutional change is slow, our theoretical framework analysis holds institutions constant to reveal the influence of domestic preferences. The effect of actors' preferences and the political coalitions that translate these preferences into government decisions are arguably harder to pinpoint, but - we argue - potentially more interesting.

In addition, both historical and contemporary land transactions have been shown to have security implications. Recent acquisitions of land in Djibouti and Sri Lanka demonstrate that land purchases may have dual use. In order to shed light on the likely geopolitical consequences of such deals, we need to understand the conditions under which land deals occur.

More generally, in an interdependent world, where security, environmental, and health considerations increasingly transcend borders, we must understand how the main actors on this stage - governments - can continue to serve their citizens while simultaneously working towards solutions for global problems with other governments. A quintessential precondition for such behavior is that states have sovereignty. Facing debt problems, land transactions might be a short-term solution to immediate payment difficulties, but also undermines governments' sovereignty. Our study sheds light on how debtor governments can protect political sovereignty in a context of economic pressures.

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[^0]:    ${ }^{1}$ Our results our robust to only analyzing purchases. However, we conceptualize long-term leases and purchases in similar ways, as both extend across the common tenure of a leader.

[^1]:    ${ }^{2}$ There are more companies than projects in the database as projects can involve multiple companies.

[^2]:    ${ }^{3}$ We conduct a series of tests to determine the main model's fit. In sum, residual tests show no issues with our model assumptions. More details are found in the appendix.

