Examining the Effect of IMF Conditionality on Natural Resource Policy

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Abstract

Can IMF lending improve natural resource governance in borrowing countries? While most IMF agreements mandate policy reforms in exchange for financial support, compliance with these reforms is mixed at best. The natural resource sector should be no exception. After all, resource windfalls enable short-term increases in discretionary spending, and office-seeking politicians are often unwilling to forgo this discretion by reforming the oil, gas, or mining sector. I investigate how and when borrowers go against their political interests and establish natural resource funds – a tool often promoted by the IMF – in the wake of a loan agreement. Using text analysis, statistical models, and qualitative evidence from natural resource policy and IMF conditionality for 74 countries between 1980 and 2019, I show that borrowers under an IMF agreement are more likely to create or regulate a resource fund, particularly if the agreement includes binding conditions that highlight the salience of natural resource reforms. This study contributes to extant research not only by introducing a novel dataset on country-level natural resource policy, but also, more broadly, by identifying under what circumstances international reform efforts can help combat the resource curse.

Keywords: natural resources, extractive industries, international organizations, IMF programs, conditionality

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1 Introduction

Suppose a country discovers oil or copper in its subsoil and decides to sell these resources in international markets. What should it do with its windfalls?[1] It can use some of this money to invest in human capital and public goods. It can pay external debt obligations or set money aside in a rainy day fund. It can redistribute resource revenues at the subnational level to reduce regional disparities. But if history serves as a guide, most political leaders in resource-rich countries will use their newfound wealth for electoral or personal gain.

Between 1972 and 1974, the price of imported crude oil increased almost sixfold, from 1.84 to 10.77 US dollars per barrel. In the subsequent four years, the average oil-exporting country – like Algeria, Iran, or Venezuela – only saved 17.9 percent of its windfall gain; the rest was used for public sector investments that yielded minimal or even negative rates of return (Talvi and Végh, 2005, 164). Non-renewable natural resources, like oil, natural gas, and minerals, can help developing countries meet their financing needs; but more often than not, these resources encourage fiscal profligacy in the short run and erode the quality of domestic institutions over the long run (Ross, 2015).

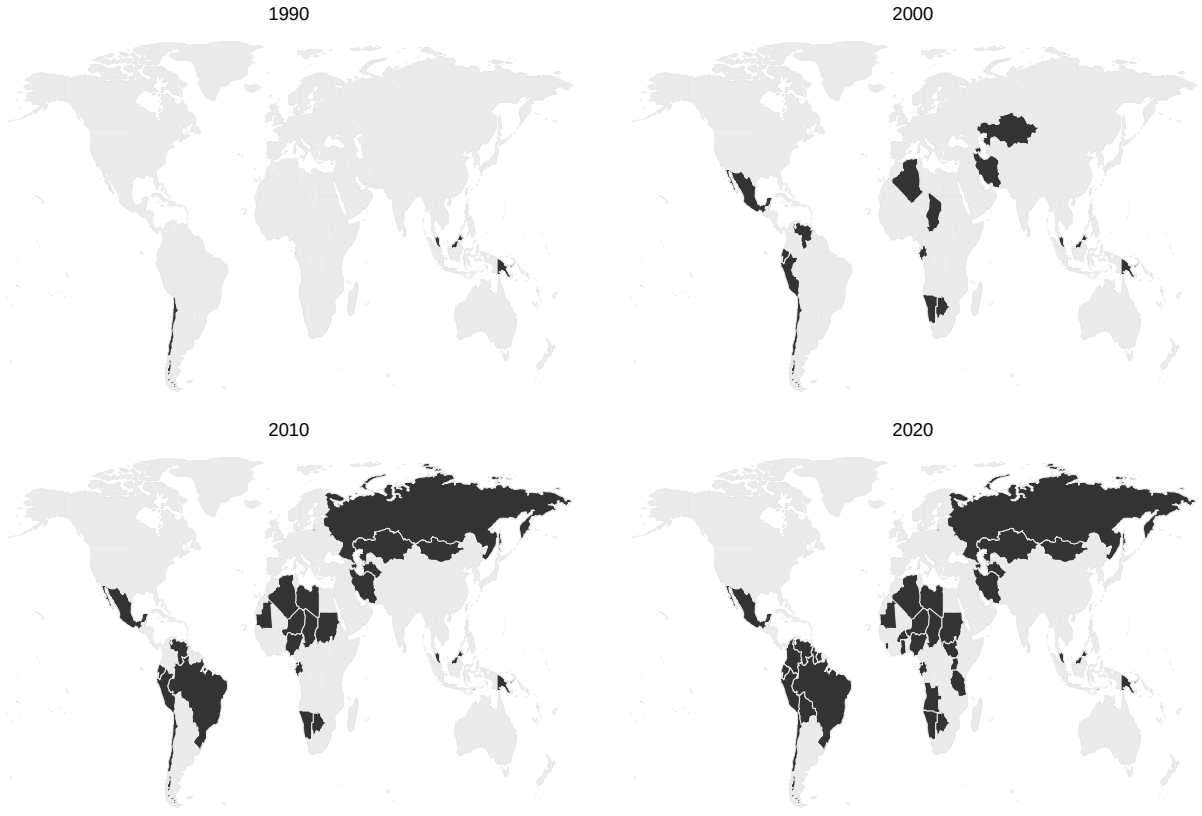
To address these issues, the International Monetary Fund (IMF) provides technical assistance to resource-rich developing countries, which often "fail to realize the full development potential of their natural resources"[2] due to weak fiscal institutions, ineffective laws, and inexperienced bureaucrats who are ill-equipped to negotiate with oil or mining corporations. Given the Fund's mandate to stabilize the global economy and resolve economic crises, its interest in natural resource governance is unsurprising. When a significant share of public revenue comes from natural resources, institutions that smooth out commodity price volatility and set aside monies for rainy days or direct them to public investment can help countries develop economic fundamentals that avert future crises. But do external efforts to promote natural resource governance work? To what extent can international financial institutions like the IMF help mitigate the resource curse?

As the world's de facto lender of last resort, the IMF provides emergency liquidity to meet a country's financing gap, which is why it often has substantial leverage over the policy decisions of its borrowers. Still, there are three reasons for skepticism about the Fund's ability to positively influence a country's natural resource governance. First, there is a high rate of recidivism in lending: some countries are regular users of IMF credit, suggesting that this credit is not promoting the lasting economic recovery it aims to promote (Bird et al., 2004). Second, compliance with IMF-mandated policy reforms – a condition for loan disbursement – is often mixed at best: between 1973 and 1997, 65 percent of all loans were suspended due to non-compliance (Bird, 2001). Third, domestic leaders are typically unwilling to regulate the natural resource sector, because resource windfalls allow for short-term increases in discretionary spending that can be used for political gain (Ross, 2015). In light of these considerations, I identify the circumstances under which multilateral lending can drive the leaders of resource-rich countries to invest in extractive governance in one

[1] In nearly every country, with the exception of the United States (Goldberg et al., 2008), subsoil assets belong to the government, which means that national or subnational authorities have the power to decide what to do with natural resource revenue.

[2] International Monetary Fund. "A Multi-Partner Trust Fund for IMF Capacity Development in Managing Natural Resource Wealth Phase 2 (Program Document)." November 2016.

Figure 1: Cumulative Creation of Natural Resource Funds, 1980-2019



This figure depicts all resource-rich countries in the developing world that have created at least one natural resource fund by the last day of every year. Since the map excludes high income nations, it does not depict the world's largest fund: Norway's Government Pension Fund Global.

specific manner: by creating and regulating a natural resource fund. Though there are other ways to promote extractive governance, natural resource funds are explicitly supported by the IMF as tools to "support the implementation of sound fiscal policies" in contexts of resource wealth (Baunsgaard et al., 2012, 20). Over the past three decades, more and more countries have adhered to this recommendation, as Figure 1 shows.

I argue that IMF agreements can lead resource-rich countries to pass legislation creating and regulating a fund. While most agreements are conditional on policy reforms, these conditions vary on a case-by-case basis. I use text analysis to classify the conditions included in 402 loan agreements signed with 74 resource-rich developing countries between 1980 and 2019, and subsequently examine the effect of conditionality on the emergence of natural resource funds during the same period. My empirical findings confirm the positive association between IMF program participation and natural resource fund legislation, but also highlight the importance of distinguishing between different types of conditionality: fund legislation is more likely to be introduced when *binding* conditions mention the natural resource sector, but less likely when *non-binding* conditions do the same.

A long line of research has examined how international organizations affect domestic poli-

tics and law. The European Union, the United Nations, the World Bank, the IMF, and others have played a prominent role setting best practices for human rights (Simmons, 2009), monetary law (Simmons, 2000), money laundering (Findley et al., 2015), anti-corruption efforts (Kaczmarek and Newman, 2011), climate policy (Mclean and Stone, 2012), transparency of elections (Hyde, 2007), and the use of military force (Fang et al., 2014).[3] In parallel, a widespread body of evidence finds that natural resource wealth can undermine democratic transitions (Ross, 2001; Andersen and Ross, 2014), curb economic growth (Goldberg et al., 2008), decrease the number of women in the labor force (Ross, 2008), and reduce government incentives to collect taxes (Gervasoni, 2010; Besley and Persson, 2014) or uphold contracts with foreign investors (Jensen and Johnston, 2011). I build a bridge between these these two important literatures, which so far have largely neglected each other (with the notable exceptions of Papyrakis et al. 2017 and Sovacool et al. 2016, who examine the role of the Extractive Industries Transparency Initiative in setting global standards for natural resource revenue management). This study contributes to extant research by identifying under what circumstances international reform efforts can lead to changes in domestic legislation, even in a sector that incumbents would prefer not to reform. To my knowledge, this is also one of the first studies to use automated text analysis to classify IMF conditions (see also Clark, 2020).

The remainder of this study proceeds as follows. After reviewing the literature on IMF conditionality, I develop a theory of why and when multilateral lending can increase the odds of policy reform. Specifically, I predict that pressure from the IMF will drive impatient politicians to exercise self-restraint in the natural resource sector by creating a natural resource fund. I derive and test my hypotheses, discuss the empirical findings, and conclude with implications for future policy and research.

2 IMF Lending and Policy Conditionality

2.1 The Purpose of Policy Conditionality

Since 1952, virtually all IMF programs are conditional: in exchange for financial support, the borrowing government is expected to pass a series of policy reforms on issues like debt management, privatization, fiscal transparency, trade liberalization, and public spending (Gould, 2003; Rickard and Caraway, 2019). The specific conditions vary from country to country, in response to local circumstances (Stone, 2008) and at the discretion of the Fund's staffers (Chwieroth, 2013), but always under the assumption that the Fund's technical knowledge and advice is transferable across circumstances, in what Barnett and Finnemore (2004, 39) call "bureaucratic universalism." As a result, loan conditions align with the Fund's mandate to provide "policy advice and capacity development support to help countries build and maintain strong economies."[4] The purpose of a program is to *build* strong economies

[3]However, Chaudoin et al. (2018) show that many of these findings might be a function of false positives, because the unobservable factors driving membership in international organizations coincide with the unobservable factors driving compliance with best practices.

[4]IMF. "The IMF and the World Bank." 25 February 2019. `https://www.imf.org/en/About/Factsheets/Sheets/2016/07/27/15/31/IMF-World-Bank`

by providing immediate liquidity, and *maintain* strong economies by conditioning loan disbursement to the implementation of predetermined structural reforms. Compliance with these predetermined reforms may be rewarded with more loans, while non-compliance may be punished with interruption of payments (Babb and Carruthers, 2008).

The threat of punishment is important because politicians are impatient and value immediate electoral benefits over future policy investments (Jacobs and Matthews, 2012). This impatience mirrors the behavior of voters, who have more confidence in concrete short-term benefits than in longer-term policy promises, and thus have well-established short-term preferences: they want high real income, high growth, low inflation, and low unemployment (Schultz, 1995). IMF programs, which often go against these preferences, are unpopular with the general public (Vreeland, 2003). As a result, incumbents would rather increase current expenditure to improve their re-election prospects than comply with the terms of an IMF agreement, particularly ahead of elections (Dreher, 2003). When the Fund threatens to interrupt payments in case of non-compliance, it attempts to force incumbents to do something they would prefer not to do. Absent such conditions, incumbents would not feel compelled to follow through with the necessary policy reforms (Dreher, 2009). Even incumbents who *want* to implement painful austerity measures would not have the political capital to do so if they could not claim that these reforms are "imposed" by the IMF (Vreeland, 2003). In sum, politicians are more likely to commit to credible policy reforms and timely loan repayment when the threat of punishment prevents them from changing policies in the future.

The logic outlined above assumes that compliance can be attained and enforced. To be fair, compliance with IMF conditions is relatively low. Between 1973 and 1997, only 35 percent of all loans were fully disbursed; the remaining 65 percent were suspended at some point due to non-compliance (Bird, 2001). 93 percent of all countries participating in an IMF program between 1993 and 2003 experienced at least one program suspension (Stone, 2011). Non-compliance may be a function of low state capacity: some governments lack a trained bureaucracy capable of creating and maintaining transparent fiscal institutions. Others might fail to comply due to ethnic divisions, too many parties in the ruling coalition, or the existence of a divided government (Steinwand and Stone, 2008). Yet, non-compliance may also be a deliberate political choice: given that the IMF is less likely to enforce compliance when the borrower has strong political relationships with the US (Dreher and Jensen, 2007; Copelovitch, 2010b; Stone, 2011), some incumbents might not want to comply with an agreement and risk losing popular support if punishment is unlikely in first place. Either way, these low compliance rates suggest that IMF conditionality might not have a meaningful or lasting influence on domestic policies.

Still, compliance is "a spectrum, not a binary variable" (Babb and Carruthers, 2008, 21). Borrowers may comply with some conditions, if not with others. Just as full compliance is not equivalent to absolute success, failing to complete an arrangement is not indicative of absolute failure. It is difficult to assess when IMF programs succeed and when they fail, as countries choosing to enter an agreement tend to have worse economic indicators to begin with (Bas and Stone, 2014). Success is hard to quantify, because IMF lending has different effects on different issue areas: it can worsen labor rights (Lee and Woo, 2020), exacerbate poverty and inequality (Nooruddin and Simmons, 2006; Oberdabernig, 2013), reduce public sector spending (Rickard and Caraway, 2019), raise tax revenue (Crivelli and Gupta, 2016),

increase trade openness (Wei and Zhang, 2010), increase capital inflows and reduce the risk of default (Bauer et al., 2012), to name only a few issue areas (see Stubbs et al. 2020 for an overview). One way to quantify success is by observing whether countries pass laws reforming fiscal practices in response to IMF programs. For example, after signing an agreement with the Fund, resource-rich countries might commit to domestic reforms that – at least on paper – ameliorate the negative consequences of the resource curse. Policymakers may still find creative ways to evade these reforms, but passing a law already makes it harder to behave in a completely unfettered manner. Even if the IMF cannot always enforce compliance or set rules of its own, it can propel a deeper institutional change that outlasts one credit line or one term of office.

2.2 Why IMF Lending Matters for Resource-Rich Countries

It is not immediately clear why resource-rich countries enter IMF programs in first place. Why would a country agree to the terms of a loan, revealing unfavorable information about the state of its economy and committing to costly policy reforms, when it can simply sell natural resources in global markets and accumulate international reserves instead? Indeed, there is some evidence that commodity producers borrow less from capital markets than non-producers because they can use resource rents to cover their financing needs (Brooks et al., 2015; Campello, 2015). However, this does not mean that commodity producers can eschew external funding altogether.

Commodity producers still need external funding because the prices of oil, nickel, silver, copper, zinc, aluminum, gold, and other natural resources are volatile. During a price boom, resource exports might be sufficient to cover domestic financing needs, but most countries do not use these windfall gains to save for times of price bust. Rather, most rulers respond to price booms by going on a public sector spending spree associated with low returns (Talvi and Végh, 2005). After all, rulers are impatient and driven by short-term political incentives: they want to maximize their political capital today, instead of waiting for some uncertain tomorrow, when they might no longer be in power, oil prices might go down, and natural resources might be depleted. Resource windfalls enable immediate consumption; these windfalls can be used to lower taxes, increase spending, distribute spoils, and co-opt the opposition, thereby broadening the ruler's basis of support.

In the absence of a far-sighted natural resource policy, resource producers do not tend to save windfalls for difficult times. Since these countries tend to specialize in natural resources at the expense of other sectors, no other segment of the economy is competitive enough to offset the volatility of prices. As a result, they cut public spending and issue sovereign debt during a commodity price bust. Because resource producers have limited access to bond markets in times of economic downturn (Wibbels, 2006), they frequently turn to the IMF, the world's de facto lender of last resort. IMF loans are meant to complement – not replace – extant sources of revenue. Even if these loans are small relative to the financial needs of a country (Steinwand and Stone, 2008), the Fund's "seal of approval" can help secure additional capital flows and improve the investment climate, at least under some circumstances.[5] Given

[5]While Rodrik (1995) finds no evidence for such effect, recent scholarship provides a more nuanced picture: IMF lending can catalyze private capital flows in democracies (Bauer et al., 2012), under intermediate

that the resource sector has the potential to help governments overcome fiscal imbalances and meet their financing gap, the IMF is interested in outlining loan conditions that maximize this potential. Thus, resource-rich countries – like resource-poor countries – might still agree to IMF conditions in exchange for financial support.

2.3 The Role of Natural Resource Funds

When the sources of public revenue are predictable, it is easier to set yearly spending goals and reconcile short-term spending with long-term planning. Governments know that they will always have a population to tax and can design the budget accordingly. However, when a significant part of the budget comes from natural resources, planning ahead is much harder, as public revenue is a function of many factors beyond most governments' control. Political actors do not know exactly how much money they will make off natural resources in the next year. They may be surprised by high prices in one given year, only to see these profits dwindle in the following year. To drive this point home, Figure 2 shows the average yearly price for a barrel of crude oil, in 2021 US dollars, from 1974 until 2020. In light of this persistent price volatility, the IMF encourages resource-rich countries to adopt numeric fiscal targets that insulate public spending from public revenue, avoiding stop-go cycles in public investment. These fiscal targets can limit the size of the public debt, impose a limit to public spending, or require that spending equals revenue, for example.

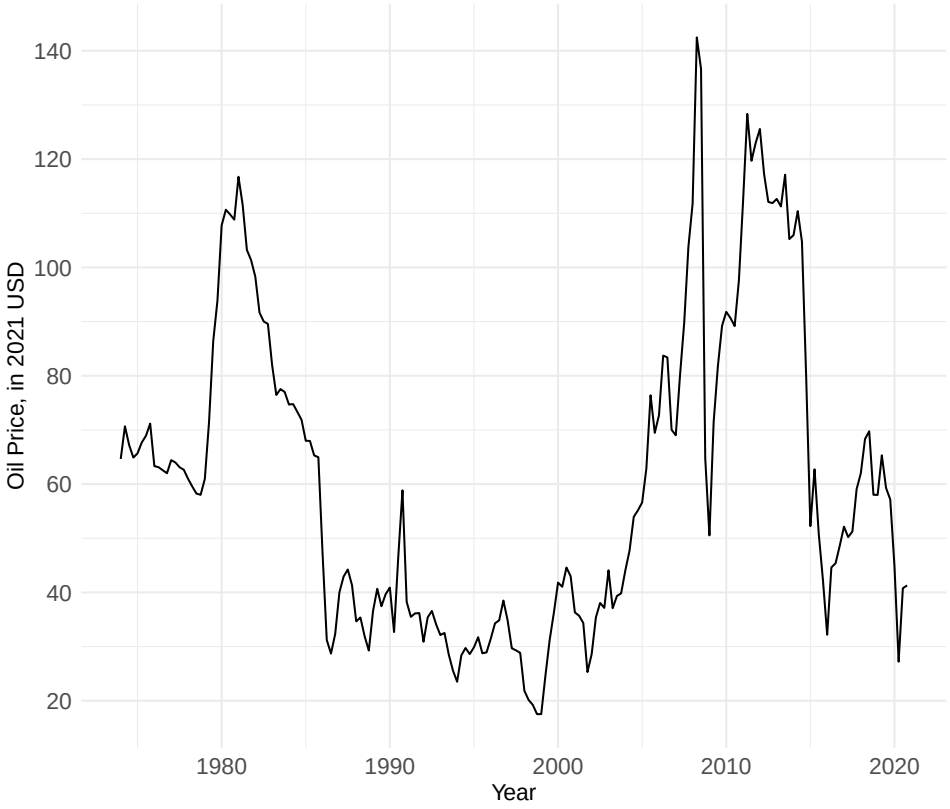
One tool to pursue these fiscal targets is a natural resource fund, which – in the words of IMF staff – can "support the implementation of sound fiscal policies" and "enhance the transparency and credibility of fiscal policy" (Baunsgaard et al., 2012, 20). Resource funds are a type of sovereign wealth fund: they are state-owned investment accounts that use revenue from the extractive sector to purchase international assets like private equity and real estate.[6] These funds, which have gained in popularity since the late 1990s (as indicated by Figure 1 and discussed extensively by Chwieroth 2014), serve as a precommitment mechanism that constrains incumbents' discretion over resource revenue by putting this revenue beyond their immediate reach.

The IMF (2008) identifies five types of funds with five non-exclusive mandates. First, stabilization accounts mitigate budget volatility caused by unexpected fluctuations in resource prices. When revenue declines, countries can draw from their stabilization accounts to sustain current expenditures, instead of borrowing from international capital markets. Second, reserve investment corporations increase the return on foreign exchange reserves, which in turn serve to manage exchange rates and reduce the risk of Dutch disease. These "parking funds" (Venables, 2016) work as a temporary storage unit for economies that cannot absorb the unexpected influx of foreign currency all at once. Third, development funds finance socio-economic projects, including durable physical assets like public infrastructure. Fourth, savings accounts benefit future generations. Since oil, natural gas, and minerals are not renewable, saving natural resource revenue can prolong the financial benefits of resource extraction. Finally, contingent pension reserve funds help finance pensions and social welfare

financial risk (Saravia and Mody, 2003), and conditional on the amount of financing and conditionality (Chapman et al., 2017).

[6]Botswana, Chile, Ghana, Kazakhstan, Norway, and many others explicitly prohibit their funds from purchasing domestic assets. Iran is one of the few countries allowing for both (Bauer et al., 2014).

Figure 2: Real Imported Crude Oil Prices, in 2021 US Dollars, 1974–2020



This figure shows the refiner average imported crude oil acquisition cost, in constant 2021 US dollars, as reported by the US Energy Information Administration.

liabilities. Since these funds have different time horizons, they pursue different investment strategies: stabilization funds have a short-term, low-risk investment profile, whereas savings or pension accounts have a long-term, high-risk investment profile due to their low liquidity needs.

Though nearly all extant natural resource funds are enshrined in legislation, they are institutionalized to different degrees: some are subject to public scrutiny, regular audits, and legislative oversight, while others are not. (Wang and Li, 2016). The IMF has taken an active role in promoting and endorsing this institutionalization process. Timor-Leste's Petroleum Fund Law, passed on 3 August 2005, was drafted with the support of a resident advisor from the IMF Fiscal Affairs Department; according to an IMF staff report, "the creation of a Norwegian-style petroleum fund and the adoption of a cautious saving policy are major steps in the right direction" (IMF, 2005). Similarly, a 2007 staff report urged Angola to consider the creation of "an oil fund that is based on well-defined flexible rules and fully integrated into the budget process, and buttressed by stringent procedures to ensure transparency" (IMF, 2007). Unsurprisingly, the number of developing countries with at least one natural resource fund has soared over the past three decades, as Figure 1 shows.

When policymakers in Timor-Leste or Angola craft natural resource legislation, they face an intertemporal trade-off: they must balance short-term pain with long-term gain,

enacting policies that impose political costs in the short term, but ensure that future generations will benefit from resource wealth – long after oil, gas, or mining reserves are depleted. As a rule, incumbents have little incentive to engage in such behavior; they "discount the future too much" (Robinson et al., 2006, 466), for two reasons. First, in the wake of a resource discovery (particularly oil), citizens tend to develop "a bias towards exaggeration of the likely revenues" (Collier, 2017, 223), pressuring rulers to increase consumption. Indeed, oil windfalls are directly associated with an increase in public goods spending (Caselli and Michaels, 2013); running budget surpluses instead of increasing current expenditure is politically costly (Talvi and Végh, 2005). This means that policymakers who create a natural resource fund – especially a fund with longer time horizons – risk losing political support. Second, institutional upgrades are costly: when incumbents craft and enact natural resource legislation, they also make a public commitment to estimate the size of available reserves, hire qualified personnel to negotiate concession agreements, save a share of resource rents, and establish regulatory bodies to enforce compliance, to name only a few tasks that are exceptionally costly for developing countries with weak institutions. As a result, policymakers would prefer not to pass any natural resource policy, instead maintaining full discretion over who benefits from resource windfalls, and when.[7]

3 Policy Conditionality and Natural Resource Funds: Two Testable Hypotheses

3.1 Main Hypotheses

There is a tension between domestic interests and international commitments; ruling parties need to respond to voters in order to win elections and stay in power, but they also need to meet the demands of international creditors (Ezrow and Hellwig, 2014). Therefore, incumbents who enter an IMF program face a dilemma: they want to retain full control over the allocation of resource windfalls in order to maximize political support, minimize institutional costs, and respond to unforeseen circumstances, but they also need to comply with the terms of the program to ensure that the funds are disbursed. First, I seek to establish whether or not participation in a program matters; after all, there is reason to suspect that program participation does not always result in reform. Hypothesis 1 predicts that incumbents will be more likely to pass legislation related to a natural resource fund when they have an outstanding IMF program – even if doing so goes against their political interests.

> **Hypothesis 1 (IMF program):** *All else equal, governments are more likely to pass natural resource policy when they are under an IMF program.*

Going beyond program participation, I propose a second hypothesis to test for the effect of specific program conditions. Several IMF programs include a targeted condition

[7] Along these lines, Wiens (2014, 196) shows that when institutional mechanisms constraining incumbent behavior are absent "*prior to the onset of resource dependence*, resource revenues undermine any impetus to establish 'good' institutions in their wake and serve to stabilize 'bad' institutions" (emphasis in the original).

related to natural resources. For instance, a 2009–2012 loan agreement with Angola mandated the "submission to the cabinet of the approval documents of the Angola Sovereign Wealth Fund."[8] In line with this condition, president José Eduardo dos Santos signed a decree creating an oil fund in March 2011. More recently, following a 2013–2016 arrangement mandating the "establish[ment of] a Natural Resource Revenue Fund with legal and procedural characteristics," the government of Sierra Leone created the Transformational Development Stabilization Fund in 2016. Angola and Sierra Leone were each explicitly instructed to create a natural resource fund, and these instructions were written in a way that made non-compliance easily observable – and punishable. Having agreed to enter IMF programs, these countries did not have the leeway to develop alternative policies and would not have been able to deviate from their respective loan conditions without jeopardizing the disbursement of additional funds.

Conditions might also request changes to an extant fund, as in Ecuador's 2000–2001 agreement ("submission to congress of legislation that includes agreed reforms of the oil stabilization fund") or Chad's 2005–2008 agreement ("adoption by the Council of Ministers of the investment strategy for oil revenue allocated to the Fund for Future Generations"). The cases of Angola, Sierra Leone, Ecuador, and Chad suggest that borrowers might be more likely to pass natural resource policy in response to targeted natural resource conditions, which highlight the salience of natural resources and the need to reform the extractive sector. This is what Hypothesis 2 predicts.

> **Hypothesis 2 (IMF resource conditionality):** *All else equal, governments are more likely to pass natural resource policy when they are under an IMF program that includes conditions related to natural resources.*

Admittedly, several conditions address the extractive sector without explicitly urging borrowers to create a natural resource fund. Recent agreements signed with Mozambique (2009–2010), Iraq (2010–2012), Gabon (2017–2020), Equatorial Guinea (2019–2022), and others require these governments to join the Extractive Industries Transparency Initiative (EITI), a multi-stakeholder initiative promoting transparency along the extractive industry value chain. When the borrower is already a member of EITI, conditions often request that the country in question "demonstrate[s] progress in implementing the EITI Standard" (Afghanistan, 2016–2019) – for instance, by publishing an EITI audit report (Nigeria, 2005–2007). Countless conditions also require governments to cut fossil fuel subsidies, thereby allowing domestic prices to respond to fluctuations in international commodity prices, though this measure is exceedingly unpopular and often politically impracticable. And lastly, a number of conditions require governments to "strengthen the governance of the mining industry" (Afghanistan 2016–2019), in a multitude of different ways. Though these conditions do not necessarily foresee the creation or regulation of a natural resource fund, they have one aspect in common: they request that states deepen their commitment to good governance in the extractive sector. I argue that natural resource funds are an efficient – if sometimes painful – way to signal such commitment to the IMF. For this reason, Hypothesis

[8]The source for this and subsequent citations is Kentikelenis et al. (2016), whose dataset reproduces the text of each condition for each Letter of Intent signed between 1980 and 2014; and the IMF MONA Database, which does the same for agreements signed between 2003 and 2020.

2 predicts that governments should be more likely to pass natural resource policy in response to this kind of conditionality than in response to other kinds of conditionality.

4 Data and Descriptive Analysis

4.1 Dependent Variable: Natural Resource Policy

I introduce original data on natural resource policy for 74 developing countries between 1980 and 2019 (see appendix for full country list). This corresponds to all developing countries classified as resource rich by the IMF (Venables, 2016), the Natural Resource Governance Institute (2017), or both. The dependent variable is a binary indicator of whether each country-year pair passed a legal document (that is, a law, statute, act, code, or executive decree) creating or regulating a natural resource fund. This indicator takes the value of one in years of document passage, and zero otherwise. To collect these data, I first use the Natural Resource Governance Institute (2017) and the IMF Fiscal Rules at a Glance Dataset (Lledó et al., 2017) to identify the precise country-year in which a legal document was passed. I then locate each legal document in its country's Official Gazette, available in the Foreign Official Gazette Database and the Global Legal Information Network (two initiatives sponsored by the US Library of Congress). During the period under study, 39 of the 74 countries in the analysis passed a total of 80 legal documents pertaining to 61 distinct natural resource funds. The remaining 35 countries have not passed any natural resource policy during the period under study. Figure 3 shows the number of legal documents passed at the national level between 1980 and 2019, indicating that the vast majority was passed after 1995.

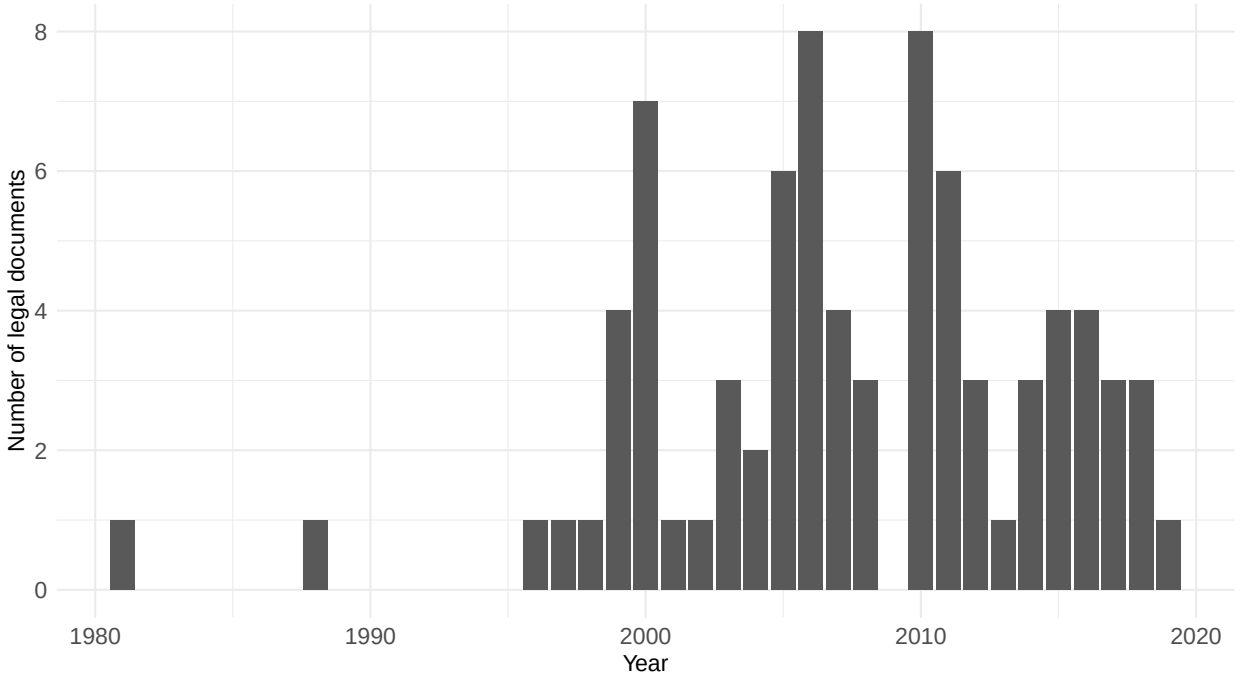
To illustrate the content of such legal documents, consider Angola, where president José Eduardo dos Santos signed the Executive Decree Number 48 creating the Sovereign Wealth Fund of Angola on 9 March 2011. The purpose of the fund is to "encourage and support, in the Republic of Angola and abroad, investment in the development of projects in the energy and water sectors and in other sectors considered strategic, including, in particular, infrastructure projects."[9] Under the Santos administration, the 2011 Budget Law[10] (passed on 28 December 2010) also earmarked oil revenue for regional development and infrastructure, with budget projections based on an oil price of 68 USD per barrel; all revenue exceeding this projection should enter the treasury reserve. Both the Executive Decree Number 48 and the 2011 Budget Law count as natural resource policy.

Recall the IMF (2008) taxonomy of natural resource funds. At one extreme, stabilization funds have low-risk, fixed-income portfolios meant to provide immediate liquidity that offsets the losses caused by unexpected fluctuation in commodity prices. Reserve investment corporations and development funds have similarly short horizons, serving as temporary storage units until the domestic economy can absorb resource rents and use them to invest in socio-economic projects. At the other extreme, savings and pension funds have diversified portfolios and can finance riskier investments due to their long time horizons and low liquidity needs. As a consequence of these different time horizons, incumbents have more discretion

[9]Decreto Presidencial No. 48/11, 9 March 2011. Article 1, Paragraph 3.

[10]Lei do Orçamento Geral do Estado – Lei 26/10, 28 December 2010.

Figure 3: Number of Legal Documents Passed Every Year, 1980-2019



This figure depicts the temporal distribution of 80 legal documents creating and regulating natural resource funds in 37 countries during the period covered in the analysis.

over stabilization, investment, and development funds than over savings or pension funds. Chile has two funds, both created in 2006; the Economic and Social Stabilization Fund was made immediately available to cover current expenditures,[11] while the Pension Reserve Fund – earmarked for old-age and disability benefits – was off-limits to public officials for the first ten years after its creation.[12] Both funds represent precommitment mechanisms, but the degree of precommitment is different. I generate two binary variables to account for this distinction: *Short-term policy* measures the passage of legal documents related to stabilization, investment, or development funds, whereas *Long-term policy* indicates the passage of documents related to savings or pension funds.

Table 1 shows the number of funds, legal documents, and countries by type of policy. The numbers in this table do not add up to the totals (61 funds, 80 legal documents, 39 countries) because one fund can fulfill multiple purposes. For example, in a Letter of Intent (LOI) submitted to the IMF in November 2009,[13] the government of Angola states: "we would welcome technical assistance from the IMF on the setting up [of] the Sovereign Wealth Fund *which will be both a stabilization and a savings fund*" (emphasis added). Thus, the Executive Decree Number 48 and the 2011 Budget Law, which create and regulate the Sovereign Wealth Fund of Angola, are coded as both *Short-term policy* and *Long-term policy*. The same applies

[11]Decreto con Fuerza de Ley 1, 11 December 2006.

[12]Ley 20128 Sobre Responsabilidad Fiscal, 22 September 2006.

[13]The full LOI is available under `https://www.imf.org/external/np/loi/2009/ago/110309.pdf`

Table 1: Natural Resource Funds and Corresponding Legal Documents, by Type

	Short-Term Policy			Long-Term Policy	
	Stabilization	Investment	Development	Savings	Pension
# of funds	33	10	16	18	1
# of legal documents	49	14	18	23	1
# of countries	25	8	15	17	1

to legal documents pertaining to Colombia's Savings and Stabilization Fund or Trinidad and Tobago's Heritage and Stabilization Fund, among others.

I focus on written legal documents because they are easier to enforce and harder to revoke than unwritten norms. Admittedly, these documents are often aspirational, rather than normatively binding; in Latin America, for example, governments often bend or evade formal rules (Weyland, 2002), which could suggest that natural resource policy is not a credible precommitment mechanism. Still, it is useful to understand when and why de jure policy is enacted because this is a necessary first step toward explaining the effects of law on behavior. Even where formal rules are bent or evaded, they still approximate political behavior. For example, Amick et al. (2020) find that both constitutional and statutory rules mandating a balanced budget are associated with higher fiscal discipline, even in Latin American countries where formal rules are frequently disregarded. There is value in examining what states aspire to do and what they are willing to commit to on paper, regardless of their ability to actually comply with such aspirations.

Of course, there is considerable variation in what states aspire to do, even within the short-term and long-term categories. Some legal documents stipulate that the fund in question should be managed by a supervisory board (Azerbaijan), while others delegate this responsibility to the Central Bank (Botswana) or the Minister of Finance (Chile). With few exceptions (like Russia), most documents mandate the creation of an independent oversight body to monitor the fund's management and investment decisions, but there is variation in the size and composition of such body: oversight committees in Ghana, Guyana, and Nigeria incorporate civil society representatives, suggesting a stronger commitment to transparency and public accountability. Additionally, while Angola's laws make budget projections based on a fixed oil price (68 USD per barrel), others allow the president or the National Assembly to set a new reference price every year, giving authorities important discretion over how much natural resource revenue can enter the budget (as opposed to being saved in a fund). However, since there are only 80 such legal documents, I am not able to quantitatively explore this variation in depth and scope. This is why I examine the dichotomy between short-term and long-term policy, reducing these legal documents to their common denominator.

Table 2 reports the average of selected variables for countries with and without natural resource funds in place in 2019, using World Bank data from the same year (or from the most recent year available). In that year, countries with natural resource funds tended to have a higher GDP per capita and a higher GDP share of natural resource rents than countries without such funds. In the previous four decades, states with funds also tended to be under an IMF agreement for fewer years: 13.62, as opposed to a mean of 15.90 years for countries

Table 2: Characteristics of Countries With and Without Natural Resource Funds, 2019

	Natural Resource Fund	
Attribute	Yes	No
# of years under IMF program, 1980–2019	13.62	15.90
GDP per capita (in constant 2010 USD)	5,837.33	2,574.74
Resource rents (% GDP)	16.81	10.69
N	39	35

without funds. This suggests that there is something qualitatively different about states that are able and willing to adopt precommitment mechanisms in the extractive sector.

4.2 Independent Variables: IMF Program Participation and Conditionality

Using data from Kentikelenis et al. (2016) (for 1980–2014) and the IMF MONA Database (for 2003–2019), I examine the content of 402 IMF programs signed with 64 of the 74 developing countries identified as resource rich. The remaining ten countries,[14] while included in the analysis, signed no agreement in the period under study. The terms of each agreement, including the conditions for loan disbursement, are stipulated in its Letter of Intent (LOI).[15] Like Copelovitch (2010a), Woo (2013), Forster et al. (2019), and several others, I restrict the analysis to conditions categorized as Prior Actions (PA) or Performance Criteria (PC). These two kinds of conditions are binding, which means that loan disbursement is conditional on their implementation.[16] To the extent that countries create natural resource funds in response to IMF conditionality, they should do so in response to *binding* conditions; after all, failure to comply with *non-binding* conditions is unlikely to jeopardize the disbursement of funds. On average, each agreement lasts for two years and includes 17.5 binding conditions, with a standard deviation of 17.9, adding up to just over 6,800 binding conditions (out of 14,100 total conditions).

Extant research on the relationship between IMF conditionality and public policy tends to focus on the *number* of conditions pertaining to a specific issue area (e.g. Dreher and Jensen, 2007; Woo, 2013; Stubbs et al., 2020). However, the number of conditions is an imperfect proxy for the stringency of an agreement, as it does not tell us anything about the denominator. The relative importance of one single condition covering one specific issue area is conditional on the total number of conditions covering all issue areas. Alternatively, Stone (2008) captures the stringency of agreements by counting the number of issue areas

[14]Botswana, Eritrea, Iran, Libya, Malaysia, Namibia, South Sudan, Syria, Timor-Leste, and Turkmenistan.

[15]The LOI for each agreement is several pages long and includes an extensive discussion of the borrowing country's economic perils. In the following statistical analysis, I focus exclusively on the conditions for loan disbursement and disregard any additional content.

[16]In contrast, Structural Benchmarks (SB) or Indicative Targets (IT) are non-binding: loans are not automatically suspended if a borrowing country fails to meet such conditions (see Copelovitch, 2010a, 52-53 for a detailed discussion of such differences).

subject to test in every program review, but again, this measure does not reflect the weight of issue areas included in the review *relative to all possible issue areas.* Other researchers use a binary variable to indicate the presence or absence of a specific kind of condition – for example, a trade condition (Wei and Zhang, 2010) or a labor condition (Rickard and Caraway, 2019) –, but one single condition can address multiple issue areas, and a binary indicator might not capture this nuance. Given the limitations of extant approaches, I use automated text analysis to classify the 14,100 conditions into different categories of interest.

Though there is no single best method for automated text analysis (Grimmer and Stewart, 2013), probabilistic topic models are helpful in uncovering similarities between semantically comparable documents, by identifying the proportion of each document (in this case, an IMF condition) that addresses a specific topic. A topic is a distribution over a fixed vocabulary (Blei, 2012); for example, the topic *natural resources* has a fixed vocabulary that includes words like *oil*, *mining*, and *hydrocarbon.* Like other methods of unsupervised learning, topic models do not require training sets and are suitable for new discoveries: they can parse the data to identify hidden patterns that are not immediately evident to the human eye (like the unobservable influence of IMF conditionality on domestic legislation). Researchers can use these models to make inferences about unobserved latent topics, with few a priori assumptions about the documents being analyzed.

One weakness of traditional topic models is their instability. Despite its name, automated text analysis is not entirely automated; researchers must specify the number of topics in advance, label each topic, and interpret the results, all of which are subjective decisions (Wilkerson and Casas, 2017). Topic models tend to generate multiple topics with similar content, and the results are sensitive to the starting values of the estimation algorithm. To circumvent these issues, I use the dynamic keyword assisted topic model developed by Eshima et al. (2020), which allows me to specify a small number of keywords to label the topic of interest ahead of estimation. The chosen keywords incorporate knowledge from previous research on IMF conditionality (e.g. Kentikelenis et al., 2016), from interviews I conducted with IMF officials in the Fiscal Affairs Department, and from non-binding recommendations that these officials issue to governments on a yearly basis (in the form of Article IV Consultations). This specification yields more interpretable topics and increases the stability of topic proportions across different specifications, enabling me to investigate how topic proportions change over time.

Using a dynamic keyword assisted topic model, I identify the share of each condition using words related to natural resources. Table 3 displays the ten most frequent terms for this topic; the pre-specified keywords appear in bold.[17] I instruct the model to identify 13 additional topics, based on the 13 categories identified by Kentikelenis et al. (2016) and presented in more detail in the appendix.

As the ten most common words suggest, natural resource conditionality frequently mandates an increase in the price of oil products and electricity tariffs. For example, a condition issued to Burkina Faso in 1999 stipulated the "introduction of an automatic domestic price setting mechanism of petroleum products reflecting movements in international prices." This

[17]Because pre-processing decisions can be arbitrary and misleading (Denny and Spirling, 2018; Schofield et al., 2017), I deliberately undertake as little pre-processing as possible. I remove stopwords, punctuation, numbers, and symbols, but do not stem words and do not remove infrequent terms.

Table 3: Ten Most Common Words Related to Natural Resources, Sorted by Frequency

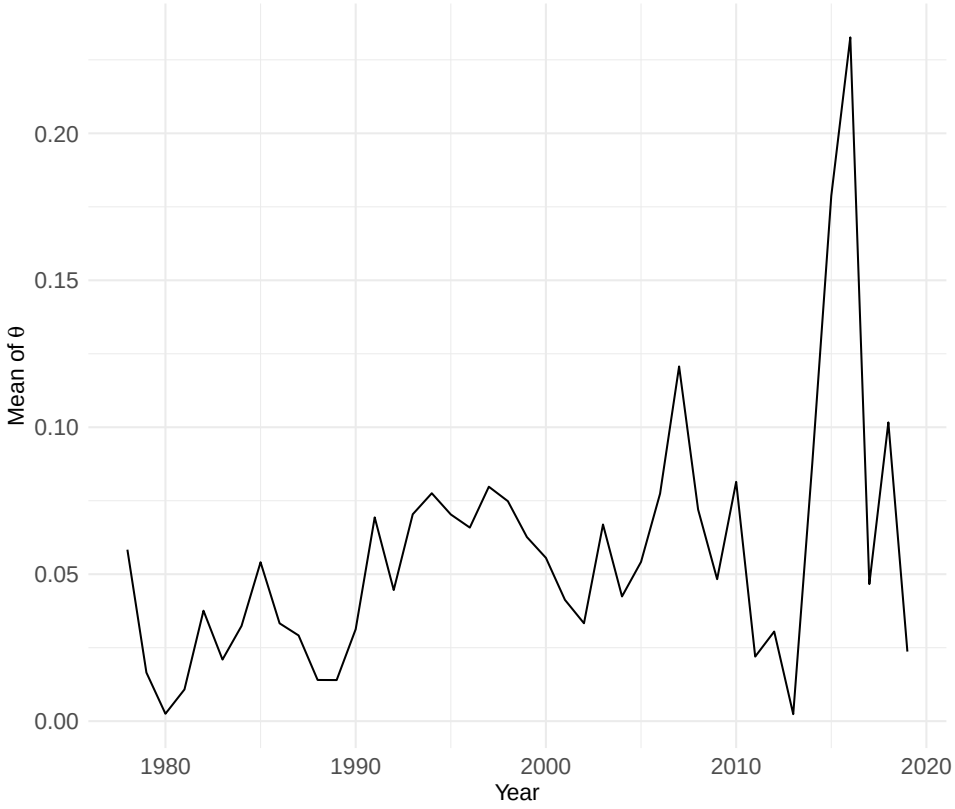
Rank	Word
1	prices
2	percent
3	**oil**
4	**petroleum**
5	price
6	increase
7	products
8	**gas**
9	**electricity**
10	tariffs

condition reflects the broader IMF stance against energy subsidies, with Fund staffers (e.g. Coady et al., 2019) finding that fossil fuels tend to be substantially underpriced in developing and developed nations alike.

Figure 4 presents the time trend for this topic, based on the year in which an IMF program was initiated. For each year in the x-axis, the y-axis represents the average proportion of words associated with natural resources. In 1990, for instance, the IMF initiated six loan arrangements with a total of 94 binding conditions; on average, just three percent of the words included in these conditions related to natural resources. In contrast, natural resources corresponded to about 23.3 percent of the vocabulary used in the six agreements signed in 2016. This is – at least in part – because natural resource topic proportions in any given year are highly correlated with oil prices in the previous year (see appendix for a discussion of factors predicting topic proportions).

This does not mean that all IMF agreements signed with resource-rich countries in a given year cover this topic to the same extent. Topic proportions vary not only over time, but also across countries. For example, 49.7 percent of the vocabulary in Uganda's 2006 agreement and 34.3 percent of the vocabulary in Russia's 1995 arrangement relate to natural resources – a figure that drops to 0.1 percent for Togo's 2017 agreement. These differences are more than just semantics. They suggest that the IMF does not pursue an undifferentiated "one-size-fits-all" approach to reform in resource-rich countries, instead tailoring the conditions of each agreement to the different political and economic realities of countries like Uganda, Russia, or Togo. Some countries receive a diverse set of conditions related to other categories identified by the topic model (like monetary or trade policy), while others are explicitly instructed to promote changes in the natural resource sector. Borrowers exposed to different kinds of conditionality are likely to respond differently, which is why the effect of IMF programs on natural resource policy should differ across countries. The advantage of examining the *proportion* of natural resource conditionality – rather than a dichotomous count for the presence or absence of such topic – is that I can measure the *degree* of commitment to natural resource sector reform. Because resource funds are costly, countries are only likely to pass policy related to such measures when the degree of natural resource conditionality is

Figure 4: Topic Prevalence Over Time, 1980-2019



This plot displays the prevalence of the natural resource topic over time, among all binding conditions, based on the year of program initiation (as indicated by the x-axis). The y-axis represents the relative proportion θ of this topic in each condition, averaged for all conditions over a year.

comparatively high.

I use this information to generate two independent variables. For every country and year, the binary variable *Program participation* (used to test Hypothesis 1) indicates whether a loan agreement was in place. After all, program participation has effects of its own: it increases technical assistance and policy advice, catalyzes foreign aid, and can undermine or improve perceived creditworthiness, depending on the context (Stubbs et al., 2016; Chapman et al., 2017; Lee and Woo, 2020; Stubbs et al., 2020). If *Program participation* equals one, I generate an additional independent variable, *Resource conditionality*, which indicates the prevalence of said topic among the program's conditions. This variable, reported as a percentage for ease of interpretation, is used to test Hypothesis 2 and takes the value of zero for country-years without program participation.

4.3 Control Variables

Models include a measure of whether countries have passed short-term or long-term policy in the past (*Previous short-term policy* and *Previous long-term policy*) and additional economic

variables that are correlated with the timing of natural resource policy. *GDP per capita* (in constant 2010 US dollars, logged), *GDP growth* (in percent), and *Resource rents* (as a percentage of the GDP) are reported by the World Bank. *Field discovery* indicates the discovery of a giant, supergiant, or megagiant oil and gas field (that is, a field with over 500 million recoverable barrels of oil or over 3 trillion cubic feet of gas) in a given country and year (Horn, 2014). *Oil price* is the refiner average imported crude oil acquisition cost, in constant 2021 US dollars, as reported by the US Energy Information Administration. I log this variable to account for extreme values. *Crisis* is coded one in years of banking, debt, or currency crisis and zero otherwise (Laeven and Valencia, 2020).

To control for the effect of regime type, I use the Polity 2 index, which ranges from –10 to +10, from hereditary monarchy to consolidated democracy. I further examine the ideology of the executive (a dichotomous variable, where left executive equals one, as coded by the Dataset of Political Institutions) as well as the occurrence of a parliamentary election, calculated using V-Dem data.[18] Finally, I include a dichotomous variable indicating the occurrence of war (that is, the occurrence of a civil, independent, international, or ethnic war), following data from the Major Episodes of Political Violence dataset. All independent variables are lagged by one year to avoid simultaneity bias, since passing a legal document is typically a lengthy process.

5 The Origins of Natural Resource Policy

5.1 Modeling Endogenous Policy Adoption

Participation in an IMF program is not randomly distributed: it is a function of unobservable factors that might also predict a government's willingness to reform its economy. Many countries entering IMF programs already need economic reforms and would likely pursue such reforms even in the absence of a loan. Furthermore, loan agreements are the product of month-long negotiations between government officials and the IMF staff. The negotiating government might select (or be selected) into greater degrees of conditionality, or specific kinds of conditionality, depending on domestic constraints and political willingness to reform. For example, some governments might be able to negotiate more favorable conditions ahead of a democratic election (Rickard and Caraway, 2014). Democracies tend to receive fewer conditions, suggesting that the IMF is aware that democratic institutions constrain a borrower's ability to reform (Stone, 2008). US allies tend to receive loans with fewer conditions (Dreher and Jensen, 2007). Policymakers might *want* to include certain kinds of conditions in the agreement, so as to have a credible excuse to push through unpopular economic reforms that they were already planning to implement anyway (Vreeland, 2003). Finally, borrowers might withhold information about their future intentions, instead pushing for conditions that they know in advance they will be able to meet, securing the future disbursement of funds.

To some extent, these endogeneity concerns can be assuaged by theory. Few conditions explicitly mention the natural resource sector, suggesting that few – if any – governments are actively selecting into this kind of conditionality. It is true that conditionality could depend

[18] I focus on parliamentary elections because not all countries hold presidential elections.

on expectations about the likely success of reform implementation, but what expectations could the IMF possibly have for countries like Angola or Sierra Leone, both of which experienced civil wars until 2002 and were urged to create a fund in their 2009–2012 and 2013–2016 loan agreements, respectively? Arguably, successful reform implementation would be more likely in a country with stronger macroeconomic fundamentals, like South Africa, than in Angola or Sierra Leone. Yet natural resource conditionality is considerably more prevalent among the latter two, suggesting that the IMF does not assign natural resource conditions based solely on the borrowing country's perceived ability to implement macroeconomic reforms (a conclusion that aligns with established research, e.g. Rickard and Caraway 2019; Chapman et al. 2017; Dreher et al. 2015; Nelson 2014).

To drive this point home, the appendix reports the results of panel regressions with fixed effects, using natural resource topic proportions as the dependent variable. For country-years under an agreement, these models show that an increase in oil prices or resource rents is significantly associated with a *larger* share of natural resource conditionality, while an increase in GDP per capita is significantly associated with a *smaller* share. Given that GDP per capita is a robust predictor of administrative capacity (Hendrix, 2010), this means that, if anything, the IMF is assigning a larger proportion of natural resource conditions to countries that are *less* able to reform. The more a country follows the voting patterns of the US in the United Nations General Assembly (Bailey et al., 2015), the higher the share of natural resource conditionality, which is the opposite of what we would expect if US allies were exempt from such conditions. There are no significant differences in the proportion of natural resource conditions across regime types, in years of economic crisis, or during wars. In sum, it appears that common observable proxies for the ability to reform are not related to the topic prevalence of natural resources in conditions.

5.1.1 Instrumental Variables

Despite the theoretical considerations outlined above, I take endogeneity concerns seriously and address them through econometric techniques. To study the consequences of IMF program participation while accounting for self-selection, a widespread approach is to use instrumental variables (see Stubbs et al. 2020 for a comprehensive review).

One common predictor of program participation is the share of a country's nationals among the Fund's professional staff (Barro and Lee, 2005; Casper, 2017). Though staff members are not allowed to work on programs related to their home country, Barro and Lee (2005) reason that countries with more representation within the IMF ranks enjoy a substantial informational advantage: they have easier access to inside information about the lending process. Consequently, these countries should be better able to secure a loan and to negotiate more favorable conditions.

Another instrument for program participation is temporary membership on the United Nations Security Council (Dreher et al., 2009). In providing loans to the ten elected temporary members, major World Bank and IMF shareholders (particularly the US, but also France, Germany, Japan, and the United Kingdom) can increase their influence over decisions made by the UNSC, which usually pertain to economic sanctions or military action.

Other researchers use the budget constraints faced by the Fund as an instrument to predict participation, since these constraints condition how much money the institution can

lend each year. For example, Barro and Lee (2005) examine the size of loans, operationalized as the average ratio of approved loans to GDP for each 5-year period. Relatedly, Stubbs et al. (2020) construct a compound instrument that relies on a measure developed by Lang (2020): the natural logarithm of the IMF liquidity ratio, that is, the amount of liquid resources divided by liquid liabilities. To instrument for program participation, Stubbs et al. (2020) interact the liquidity ratio with a country-specific proportion of years under IMF agreement. Prior program participation should be a good predictor of present participation, because the Fund tends to have a regular clientele: many countries are recidivist borrowers (Bird et al., 2004).

These four instruments treat selection into program *participation*. To treat selection into program *conditionality*, Beazer and Woo (2016) examine the total annual IMF disbursement as well as the number of years left until the next internal quota review by the IMF board of governors (when a country's borrowing quota might increase). Chapman et al. (2017) examine both the number of countries under an agreement in a given year and the ratio of prior commitments of IMF financing to IMF quota. Stubbs et al. (2020) interact the IMF liquidity ratio with a country-specific average of conditions covering the issue area of interest.

The aforementioned studies are interested in explaining a myriad of outcomes, like bond yields (Chapman et al., 2017), coup attempts (Casper, 2017), progress in implementing economic reforms (Beazer and Woo, 2016), public education spending (Stubbs et al., 2020), GDP growth (Barro and Lee, 2005), and inequality (Lang, 2020). Each of these studies makes a compelling case for why the chosen instruments have no independent effect on the outcome of interest. However, my outcome of interest is different. When it comes to natural resource policy, there are reasons to be skeptical about the exogeneity of these instruments: they are likely to affect policy passage even in the absence of a loan agreement, thereby violating the exclusion restriction. For example, during the period under study, the IMF liquidity ratio is significantly correlated with real oil prices,[19] as is the number of countries under an agreement in a any given year.[20] One of the countries included in my analysis (Russia) is a permanent member of the UNSC, raising questions about the validity of such instrument. And a higher share of nationals among the IMF professional staff might predict the odds of program participation, but it might also simply reflect the prevalence of neoliberal beliefs among a country's technocratic elite (Nelson, 2014).[21]

Despite theoretical concerns about violation of the exclusion restriction, I estimate two-stage least square (2SLS) models using these and other instruments for both participation and conditionality, reporting the results in the appendix. These instruments appear to be weak (as indicated by low F statistics), which might lead to inconsistent estimates (Sovey and Green, 2011). Given these limitations, I pursue an alternative method below.

[19] $\rho = 0.473$, $p = 0.001$.

[20] $\rho = -0.705$, $p = 0.000$.

[21] For example, under the authoritarian rule of Augusto Pinochet (1973–1990), economic policy in Chile was designed by the so-called Chicago Boys, a Chicago-trained neoliberal elite (Nelson, 2017, 39). Chile was also the first Latin American country to create a natural resource fund, in 1981.

5.2 Modeling Rare Events

Extant research on IMF program participation and conditionality tends to deal with a continuous dependent variable: inequality (Forster et al., 2019; Lang, 2020), labor rights (Reinsberg et al., 2019; Lee and Woo, 2020), foreign aid (Stubbs et al., 2016), foreign direct investment (Woo, 2013), public spending (Rickard and Caraway, 2019; Stubbs and Kentikelenis, 2018), bond yields (Chapman et al., 2017), and economic reform (Beazer and Woo, 2016), to name a few. To my knowledge, only Casper (2017) examines this effect on a binary dependent variable: the occurrence of an attempted coup d'état. To account both for the endogeneity and for the binary nature of the outcome of interest, the author uses a recursive bivariate probit model (RBPM), which simultaneously estimates a selection equation and an outcome equation via maximum likelihood. But this strategy also requires a variable that satisfies the exclusion restriction, and it is inadequate to model rare events. Passing natural resource policy is a rare event that did not occur every single year between 1980 and 2019, and in fact never occurred in 37 of the 74 countries under study.[22] These 37 countries are what Beck (2020) calls "homogeneous groups:" they are perfect predictors of event non-occurrence, because they show no variation in the dependent variable (which consists of all zeros). Models estimated with maximum likelihood would drop these "homogeneous groups" altogether, which is undesirable. In the following analysis, I use logistic regressions with country fixed effects and cubic polynomials (Carter and Signorino, 2010), estimated with penalized maximum likelihood to retain the complete sample (Cook et al., 2020). Still, I am realistic about the limitations of this method and view my results as corroboratory (not conclusive) evidence.

5.3 Results

In Table 4, Models 1 and 2 test Hypothesis 1. As Model 1 shows, participation in an IMF agreement more than doubles the odds of passing *Short-term policy* ($e^{0.901} = 2.462$), that is, of creating and regulating stabilization, investment, and development funds, which are suited for short- to medium-term crisis mitigation. Model 2 indicates that program participation more than triples the odds of passing *Long-term policy* ($e^{1.159} = 3.187$), which entails the creation and regulation of savings or pension funds. These results can be framed in terms of the Fund's two self-declared mandates: first, provide immediate liquidity to *build* strong economies; second, impose loan conditionality to *maintain* strong economies. Put together, Models 1 and 2 suggest that IMF agreements signed with resource-rich countries have the potential to serve both mandates: they promote short- to medium-term fiscal anchors in addition to long-term fiscal sustainability. Passing natural resource policy of any kind is a rare event, but participation in IMF programs makes such an event significantly less rare.

How, concretely, does the content of IMF agreements influence policy passage in resource-rich countries? To test Hypothesis 2, Models 3 and 4 isolate the potential consequences of program participation (including technical assistance, policy advice, and foreign aid catalysis) from the effects of conditionality. Recall that the conditionality variable represents the relative prevalence of the natural resource topic among all binding conditions for all active

[22] In contrast, Casper (2017) examines a far more common event: there were 468 coup attempts in 94 countries between 1950 and 2010.

Table 4: The Effect of IMF Program Participation and Conditionality on Natural Resource Policy (Binding Conditions), 1980–2019

	Dependent variable:			
	Short-term policy	Long-term policy	Short-term policy	Long-term policy
	(1)	(2)	(3)	(4)
IMF program = 1	0.901***	1.159***	0.908***	1.054***
	(0.233)	(0.194)	(0.242)	(0.200)
Resource conditionality (%)			−0.001	0.020***
			(0.011)	(0.006)
Previous short-term policy	−2.884***	1.590***	−2.879***	1.593***
	(0.521)	(0.340)	(0.519)	(0.329)
Previous long-term policy	−0.047	−7.358***	−0.048	−7.092***
	(0.689)	(0.940)	(0.685)	(0.892)
Resource rents (% GDP)	−0.0003	0.063***	−0.0002	0.059***
	(0.012)	(0.011)	(0.012)	(0.011)
GDP per capita (USD, log)	−0.025	2.071***	−0.027	2.273***
	(0.589)	(0.401)	(0.583)	(0.391)
GDP growth (%)	0.016**	0.025***	0.016**	0.026***
	(0.008)	(0.005)	(0.008)	(0.005)
Field discovery = 1	0.495*	−0.557	0.494*	−0.545
	(0.275)	(0.445)	(0.275)	(0.430)
Oil price (USD, log)	−2.017***	−1.161***	−2.017***	−1.136***
	(0.321)	(0.254)	(0.320)	(0.250)
Crisis = 1	−0.100	0.233	−0.100	0.188
	(0.342)	(0.197)	(0.339)	(0.191)
Democracy (Polity)	0.009	−0.347***	0.010	−0.340***
	(0.038)	(0.023)	(0.038)	(0.023)
Left executive = 1	−0.445	0.718***	−0.450	0.815***
	(0.403)	(0.184)	(0.401)	(0.188)
Parliamentary election = 1	−0.104	0.074	−0.101	0.077
	(0.201)	(0.179)	(0.200)	(0.176)
War = 1	−0.182	4.125***	−0.185	3.927***
	(0.406)	(0.457)	(0.407)	(0.429)
Constant	8.106	−20.348***	8.125	−21.556***
	(5.238)	(3.627)	(5.184)	(3.578)
Observations	2,350	2,350	2,350	2,350
Log Likelihood	−199.453	−79.715	−199.643	−80.426
Akaike Inf. Crit.	572.906	333.429	575.285	336.852

This table reports the results of penalized likelihood models with third-order polynomials, country fixed effects, and standard errors clustered by country. Coefficients represent log odds. *p<0.1; **p<0.05; ***p<0.01.

IMF programs in a given country-year. Model 4 suggests that increased coverage of natural resources has a significant effect on *Long-term policy*. Concretely, a one percent increase in *Resource conditionality* is associated with two percent increase in the odds of passing long-term policy. In contrast, the substance of loan conditions has little effect on *Short-term*

policy, as indicated by the coefficient for *Resource conditionality* in Model 3. Overall, natural resources generate well-known perverse incentives when it comes to fiscal governance, and IMF agreements might attempt to remediate this by making specific demands related to the natural resource sector. Models 3 and 4 in Table 4 suggest that these specific demands are more effective at promoting savings or pension funds than stabilization, investment, or development funds.

All else equal, governments that have already passed short-term or long-term policy are less likely to pass any additional policy of the same kind. Furthermore, a one dollar increase in the price of crude oil per barrel is associated with a four percent decrease in the odds of policy passage, suggesting that the average government likes to maintain its discretion over resource revenue in times of commodity price boom, rather than tying its hands in the form of a natural resource fund. Increases in *Resource rents*, *GDP per capita*, and *GDP growth* are associated with significant increases in *Long-term policy*: wealthier or fast-growing economies can afford to save for the future in a way that poorer or slow-growing economies cannot. These effects are weak or absent for policies related to stabilization, investment, and development funds.

The variable *Resource conditionality* reflects the content of 6,849 *binding* conditions. The reasoning, grounded in prior research, is that borrowers are unlikely to respond to non-binding conditions, since failure to comply with "soft" conditionality does not automatically lead to loan suspension. To confirm this expectation, I also compute the value of *Resource conditionality* for the 7,254 non-binding conditions and estimate its effect on policy passage. In Table 5, Models 1 and 2 present the results of these alternative specifications, showing indeed that borrowers do not respond positively to *non-binding* conditions, only to *binding* ones. In fact, when looking at non-binding conditions, a higher share of *Resource conditionality* is significantly less likely to result in natural resource policy passage, indicating that borrowers prefer to respond to such conditions in other, potentially less painful and less institutionalized ways, instead of undertaking a written commitment to reform the natural resource sector. Only binding resource conditions create the kind of urgency that makes borrowers commit to long-term policy, thereby prolonging the benefits of resource wealth.

About 1,100 of the 6,849 binding conditions were officially waived by the IMF Executive Board, which means that borrowing countries were ultimately not required to implement these reforms in order to secure the disbursement of funds. Stone (2011) and Nelson (2017) show that these waivers are discretionary in nature, which is why I also estimate models that exclude the value of *Resource conditionality* for waived conditions. In Table 5, Models 3 and 4 use the value of *Resource conditionality* only for the approximately 5,700 binding and non-waived conditions. Comparing these results to those in Table 4, it is clear that the substantive effect of resource conditionality on long-term policy is even larger for binding conditions when they are not subsequently waived.

As Chwieroth (2014, 753) shows, sovereign wealth funds are not a recent innovation, but they became particularly fashionable in the late 1990s. This coincides with an increase in the prevalence of natural resource conditionality, as indicated by Figure 4. To account for the possibility of time trends, alternative estimations (reported in the appendix) exclude all years before 1995 or before 2000, leading to conclusions that are substantively and statistically the same. Put together, Table 4, Table 5, and the corresponding robustness checks imply that content of IMF conditionality has the potential to promote long-term fiscal sustainability in

Table 5: The Effect of IMF Program Participation and Conditionality on Natural Resource Policy (Non-Binding Conditions and Binding, Non-Waived Conditions), 1980–2019

	Dependent variable:			
	Short-term policy	Long-term policy	Short-term policy	Long-term policy
	(1) *Non-binding conditions*	(2) *Non-binding conditions*	(3) *Binding, non-waived conditions*	(4) *Binding, non-waived conditions*
IMF program = 1	1.552***	1.452***	0.972***	0.948***
	(0.284)	(0.213)	(0.238)	(0.208)
Resource conditionality (%)	−0.085***	−0.030***	−0.009	0.036***
	(0.026)	(0.010)	(0.010)	(0.006)
Previous short-term policy	−2.934***	1.518***	−2.891***	1.810***
	(0.532)	(0.337)	(0.519)	(0.319)
Previous long-term policy	−0.296	−7.287***	−0.051	−6.978***
	(0.645)	(0.922)	(0.690)	(0.846)
Resource rents (% GDP)	0.001	0.064***	−0.001	0.058***
	(0.012)	(0.011)	(0.012)	(0.012)
GDP per capita (USD, log)	−0.487	2.328***	−0.119	2.514***
	(0.571)	(0.405)	(0.581)	(0.383)
GDP growth (%)	0.017**	0.026***	0.016**	0.027***
	(0.007)	(0.005)	(0.008)	(0.005)
Field discovery = 1	0.577**	−0.550	0.479*	−0.542
	(0.265)	(0.441)	(0.277)	(0.421)
Oil price (USD, log)	−1.976***	−1.063***	−2.016***	−1.135***
	(0.317)	(0.245)	(0.321)	(0.247)
Crisis = 1	−0.031	0.318*	−0.071	0.143
	(0.333)	(0.191)	(0.335)	(0.194)
Democracy (Polity)	0.009	−0.343***	0.011	−0.344***
	(0.036)	(0.023)	(0.038)	(0.023)
Left executive = 1	−0.303	0.775***	−0.452	0.778***
	(0.413)	(0.189)	(0.403)	(0.180)
Parliamentary election = 1	−0.152	0.059	−0.101	0.072
	(0.205)	(0.180)	(0.201)	(0.174)
War = 1	0.192	3.909***	−0.201	3.726***
	(0.387)	(0.428)	(0.407)	(0.394)
Constant	10.724**	−23.229***	8.857*	−23.075***
	(5.096)	(3.670)	(5.195)	(3.559)
Observations	2,350	2,350	2,350	2,350
Log Likelihood	−196.640	−79.940	−199.449	−80.174
Akaike Inf. Crit.	569.279	335.880	574.899	336.348

This table reports the results of penalized likelihood models with third-order polynomials, country fixed effects, and standard errors clustered by country. Coefficients represent log odds. *p<0.1; **p<0.05; ***p<0.01.

the natural resource sector, but only if the IMF is willing to condition loan disbursement to the implementation of such reforms. These results also support the notion that natural resource funds are costly. When loan disbursement is conditional upon natural resource sector reforms, countries are more willing to promote in-depth institutional updates than they would otherwise. But when loan disbursement is *not* conditional upon such reforms (as denoted by non-binding conditions), incumbents favor reforms that are easier to implement, in sectors that are less costly.

Lastly, I discuss the differences between short-term and long-term policy. The models in Table 4 and Table 5 do a much better job predicting the passage of long-term policy than of short-term policy. Why is this the case? Again, I return to the statement that tying one's hands is costly, but to different degrees. Savings and pension funds are long-term tools: states will reap the benefits of such policies in a more distant future, when the incumbent committing to such policy will likely no longer be in power. In political terms, savings and pension funds are particularly costly, which is why these two types of funds are more responsive to binding IMF conditionality: were it not for the IMF, rulers would likely be less able or willing to embrace such measures. In contrast, stabilization, development, and investment funds are associated with a lower political cost, given their comparatively short time horizons. They are a cheaper signal that borrowing countries are more predisposed to send, even if the specific terms of the loan agreement are not attached to the creation or regulation of such funds. Put simply, the role of IMF conditionality is more significant the higher the hurdle that self-interested incumbents must overcome in order to reform the natural resource sector.

6 Conclusion

This study identifies under what circumstances the IMF can improve natural resource governance among developing nations, leveraging its influence as the world's lender of last resort to set standards for natural resource revenue management. To reiterate, IMF loans pursue two complementary goals: they provide immediate liquidity that reduces the short-term risk of default (what Chapman et al. 2017 call the *liquidity effect*) and promote fiscal reforms that improve long-term solvency (the *conditionality effect*). Among resource-rich borrowers, I identify both a liquidity effect and a conditionality effect. Borrowers are more likely to set short-term fiscal anchors or adopt long-term fiscal sustainability mechanisms when they enter a loan agreement with the IMF. A loan agreement increases the odds that a borrowing country will create stabilization, investment, or development funds, but also savings or pensions funds. Under these circumstances, governments have incentives to model "good behavior" by adopting policy reforms that the IMF generally approves of, thereby securing loan disbursement. In particular, savings or pensions funds are more likely to emerge the more loan disbursement is conditional on natural resource reform, that is, the higher the share of binding conditions urging borrowers to reform the natural resource sector. In formal terms, this means that IMF loans can promote patience by reducing the extent to which incumbents discount the future. Overall, borrowers are most likely to reshape the allocation of natural resource revenue (creating institutions that smooth out commodity price volatility or setting aside monies for rainy days) when made aware of this revenue's potential to secure

future moneys.

To be clear, this study does not seek to normatively distinguish between "good" or "bad" advice, or between what is "right" and "wrong" for the natural resource sector. IMF conditionality is contentious and international bureaucrats are frequently accused of promoting capital market liberalization at the expense of institutional regulations (Stiglitz, 2002). My assumption is not that natural resource funds are objectively appropriate for every single borrowing country, only that they fit a global understanding of what good governance in the natural resource sector should entail. At the same time, given the widespread consensus that oil, gas, and minerals are associated with corruption and generate perverse incentives to engage in fiscal profligacy, international institutions like the IMF can motivate domestic actors to adopt mechanisms that increase short-term control over fiscal policy and prolong the benefits of natural resource wealth. Ultimately, there is substantial variation in the conditions associated with an agreement, suggesting that the IMF tailors its advice to what it considers most appropriate for each resource-rich country.

Future work might examine whether international organizations other than the IMF similarly influence natural resource policy. There is anecdotal support for this argument: as a condition to finance the Chad–Cameroon pipeline and the Doba oil field developments, the World Bank required Chad to create a Fund for Future Generations (Humphreys and Sandbu, 2007, 195). Additionally, it is worth investigating how and if the Fund's influence over natural resource governance extends to resource-rich countries that are *not* under an agreement. After all, the IMF provides advice to each of its 189 member countries, in the form of yearly Article IV consultations. Admittedly the IMF has less leverage over non-borrowers; since these countries cannot be punished through loan interruption, they face fewer incentives to behave in line with IMF advice. In this sense, Article IV consultations are not hard conditions as much as soft suggestions. Still, a study of non-borrowers might reveal a country's true motivation to pass natural resource policy, by elucidating what drives policymakers to regulate the natural resource sector when they are not in need of immediate liquidity and are not urged by international organizations to do so.

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Appendix

A Countries Included in the Analysis

Afghanistan, Albania, Algeria, Angola, Argentina, Azerbaijan, Bolivia, Botswana, Brazil, Burkina Faso, Cameroon, Central African Republic, Chad, Chile, China, Colombia, Congo, Democratic Republic of the Congo, Ecuador, Egypt, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Ghana, Guatemala, Guinea, Guyana, India, Indonesia, Iran, Iraq, Ivory Coast, Kazakhstan, Kyrgyz Republic, Laos, Liberia, Libya, Malaysia, Mali, Mauritania, Mexico, Mongolia, Morocco, Mozambique, Myanmar, Namibia, Niger, Nigeria, Papua New Guinea, Peru, Philippines, Russia, São Tomé e Príncipe, Sierra Leone, South Africa, South Sudan, Sudan, Suriname, Syria, Tanzania, Timor Leste, Togo, Trinidad and Tobago, Tunisia, Turkmenistan, Uganda, Ukraine, Uzbekistan, Venezuela, Vietnam, Yemen, Zambia, Zimbabwe.

B Legislation Included in the Analysis

Table B.1 lists all country-years of law passage; these observations are used to generate the dependent variable.

Table B.1: Countries that adopted natural resource legislation at the national level, with years of passage

Country	Year
Algeria	2000
Angola	2010, 2011
Azerbaijan	1999, 2000
Bolivia	2015
Botswana	1997
Brazil	2010
Burkina Faso	2015
Chad	1999, 2003, 2006
Chile	1981, 2006
Colombia	2011, 2012
Ecuador	2000, 2002, 2005, 2006, 2008, 2018
Equatorial Guinea	2006
Gabon	1998, 2010, 2011
Ghana	2011, 2016, 2018
Guyana	2019
Iran	2000, 2010
Kazakhstan	2000, 2005, 2010
Libya	2006, 2010
Malaysia	1988
Mauritania	2006, 2008
Mexico	2000, 2001, 2007, 2013, 2014

Mongolia	2010, 2016
Namibia	1996
Niger	2010
Nigeria	2011, 2017
Papua New Guinea	2000, 2012, 2014
Peru	1999, 2003
Russia	2003, 2006, 2007, 2008, 2017
São Tomé and Príncipe	2004
Sierra Leone	2016
South Sudan	2011, 2012
Sudan	2004, 2005
Suriname	2017
Tanzania	2015
Timor-Leste	2005
Trinidad and Tobago	2007
Turkmenistan	2014, 2018
Uganda	2015, 2016
Venezuela	1999, 2005

C Descriptive Statistics

Table C.1: Descriptive Statistics

Statistic	N	Mean	St. Dev.	Min	Max
Year	2880	1999.621	11.717	1979	2019
Short-term policy	2806	0.024	0.152	0.000	1.000
Long-term policy	2806	0.009	0.092	0.000	1.000
IMF program	2880	0.377	0.485	0	1
Resource conditionality, binding (%)	2880	1.843	5.659	0	78
Resource conditionality, binding and non-waived (%)	2880	3.280	7.755	0	70
Resource conditionality, non-binding (%)	2880	3.463	7.716	0	55
Previous short-term policy	2880	0.153	0.360	0	1
Previous long-term policy	2880	0.078	0.268	0	1
Resource rents (% GDP)	2595	13.502	12.266	0.0003	86.453
GDP per capita (USD, log)	2677	7.556	1.084	5.102	9.930
GDP growth (%)	2681	3.895	7.709	−64.047	149.973
Field discovery	2879	0.067	0.250	0	1
Oil price (USD)	2880	60.951	29.875	19.620	120.910
Oil price (USD, log)	2880	3.989	0.496	2.977	4.795
Crisis	2880	0.074	0.262	0	1
Democracy (Polity)	2734	−0.215	6.381	−9.000	10.000
Left executive	2628	0.338	0.473	0.000	1.000
Parliamentary election	2744	0.206	0.404	0.000	1.000
War	2880	0.011	0.106	0	1
Voting with US	2802	−3.193	1.049	−5.196	4.614

D Topic Models

This appendix presents a brief overview of topic models, based on Blei et al. (2003) and Eshima et al. (2020). The simplest kind of topic model is a Latent Dirichlet Allocation (LDA), which treats every document d (out of D total documents) as a random mixture over K topics. Each topic z_n is distributed as follows:

$$z_n|\theta \sim \text{Multinomial}(\theta) \tag{1}$$

with

$$\theta|\alpha \sim \text{Dirichlet}(\alpha), \tag{2}$$

where θ is the topic proportion for a given document and follows a Dirichlet distribution with parameter α, a K-dimensional vector with $\alpha_i > 0$. The value of θ is the main outcome of interest, as it indicates how much a topic z_n contributes to any given document. (Figure 4, for example, shows the average value of θ for all documents passed in a single year.)

Each document d is composed of $d = \{w_1, w_2, ..., w_N\}$ words (like those in Table 3), with N denoting the total number of words and V the number of unique words. These N words follow a Poisson distribution with parameter ξ:

$$N|\xi \sim \text{Poisson}(\xi), \tag{3}$$

where $\xi \in (0, \infty)$.

Each of the N words, w_n, has the multinomial probability $p(w_n|z_n, \beta)$ of belonging to a topic z_n (Blei et al., 2003), β being a $K \times V$ matrix $\beta_{ij} = p(w^j = 1|z^i = 1)$. A single term w_n can belong to multiple topics, since topics are not strictly independent from one another. Only $w_1, w_2, ..., w_N$ are observed; all other variables are latent, hence the model's name.

In this study, I use Eshima et al.'s (2020) keyword assisted topic model (keyATM), which outperforms the LDA both qualitatively and quantitatively. The logic behind the keyATM is similar to that of the LDA, in that it also assumes that documents are a random mixture over topics. However, the keyATM is based on a mixture of two distributions: one distribution with positive probabilities for keywords and another with positive probabilities for all words. Out of a total of K topics, researchers use their expertise to identify $\tilde{K}$ so-called keyword topics and provide a list of L_k keywords, $V_k = \{v_{k1}, v_{k2}, ..., v_{kL_k}\}$, corresponding to these topics. The remaining $K - \tilde{K}$ no-keywords topics are "residual" topics that the model identifies on its own.

For each document d, the topic z_n now follows a categorical distribution:

$$z_n|\theta \sim \text{Categorical}(\theta), \tag{4}$$

where, again, θ is the topic proportion for a given document and follows a Dirichlet distribution with parameter α. If the sampled topic z_n is a no-keyword topic, then each word w_n is distributed as follows:

$$w_n|z_n \sim \text{Categorical}(\phi_{z_n}) \text{ for } z_n \in \{\tilde{K} + 1, \tilde{K} + 2, ..., K\}, \tag{5}$$

where ϕ_{z_n} is a V-dimensional vector representing the relative frequency of each word within topic z_n (Eshima et al., 2020, 4).

If the sampled topic z_n is a keyword topic, then the distribution of each word w_n is a little more complex. First, we draw the random variable

$$s_n|z_n \sim \text{Bernoulli}(\pi_{z_n}) \text{ for } z_n \in \{1, 2, ..., \tilde{K}\}, \tag{6}$$

where π_{z_n} is the success probability for word w_n (that is, the probability that this word will be sampled). If s_n equals 0, then the word w_n is distributed as follows:

$$w_n|s_n, z_n \sim \text{Categorical}(\phi_{z_n}) \text{ for } z_n \in \{1, 2, ..., \tilde{K}\}. \tag{7}$$

If, however, s_n equals 1, then w_n follows a different categorical distribution:

$$w_n|s_n, z_n \sim \text{Categorical}(\tilde{\phi}_{z_n}) \text{ for } z_n \in \{1, 2, ..., \tilde{K}\}. \tag{8}$$

where $\tilde{\phi}_{z_n}$ is a V-dimensional vector of probabilities for the keyword list V_k. This means that L_k elements (the keywords) have positive values, and the remaining elements in V are 0.

The `R` package `keyATM`, developed by Eshima et al. (2020) and employed in this study, uses the following default prior distributions and hyper parameters:

$$\pi_{z_n} \sim \text{Beta}(1, 1) \text{ for } z_n = \{1, 2, ..., \tilde{K}\} \tag{9}$$

$$\phi_{z_n} \sim \text{Dirichlet}(0.01) \text{ for } z_n = \{1, 2, ..., \tilde{K}\} \tag{10}$$

$$\tilde{\phi}_{z_n} \sim \text{Dirichlet}(0.1) \text{ for } z_n = \{1, 2, ..., \tilde{K}\} \tag{11}$$

$$\theta_d \sim \text{Dirichlet}(\alpha) \text{ for } d = \{1, 2, ..., D\} \tag{12}$$

$$\alpha_{z_n} \sim \begin{cases} \text{Gamma}(1, 1) & \text{for } z_n = \{1, 2, ..., \tilde{K}\} \\ \text{Gamma}(1, 2) & \text{for } z_n = \{\tilde{K} + 1, \tilde{K} + 2, ..., K\} \end{cases} \tag{13}$$

As long as sample size is large, Eshima et al. (2020, 5) note that the choice of hyper parameters is not important. The only exception is π_{z_n}, which controls the weight of keywords and for which they assume a non-informative prior, Beta(1, 1) as indicated above.

In my case, the following keywords were used to generate the natural resource topic: *natural, extractive, oil, petroleum, crude, gas, gasoline, diesel, electricity, fuel, fuels, energy, refinery, hydrocarbon, mineral, mining, mine, copper, gold, diamond, iron, steel, phosphate, EITI.* Additionally, I read all 14,100 conditions – even those that are not binding – and compiled an exhaustive list of every national oil or mining company mentioned at least once: Sonelgaz (Algeria), Sonangol (Angola), SOCAR (Azerbaijan), Azerigas (sometimes spelled Azerigaz, Azerbaijan), SONABEL (Burkina Faso), SONABHY (Burkina Faso), SNH (Cameroon), SONARA (Cameroon), PETROCA (Central African Republic), SNPC (Congo), SOGARA (Gabon), PETROCI (Ivory Coast), SOMAGAZ (Mauritania), SONIDEP (Niger), NNPC (Nigeria), Gazprom (Russia), Ukrgazprom (Ukraine), OTP (Togo), Naftogaz (sometimes spelled Naftogas, Ukraine), and PDVSA (Venezuela). The names of these companies (including their different spellings) are also included as keywords.

E Modeling Endogenous Policy Adoption

E.1 Predictors of Topic Proportions

One potential source of endogeneity is that countries might select into both IMF program participation and natural resource conditionality according to their ex ante ability and willingness to reform the natural resource sector. Conversely, the Fund might assign a higher share of natural resource conditions to countries where reform implementation is expected to succeed to begin with. To address these concerns, I estimate linear models using topic proportions as the dependent variables, with all independent variables lagged by one year.

Table E.1: Predictors of Natural Resource Topic Proportions, Country-Years of IMF Program Onset, 1980–2019 (OLS)

	Dependent variable:	
	Resource conditionality, binding (%)	Resource conditionality, binding and non-waived (%)
	(1)	(2)
Resource rents (% GDP)	0.162**	0.180**
	(0.067)	(0.081)
GDP per capita (USD, log)	−2.884	−5.537**
	(2.395)	(2.807)
GDP growth (%)	−0.078	−0.160
	(0.067)	(0.106)
Field discovery = 1	0.269	−0.896
	(1.460)	(2.144)
Oil price (USD)	−7.333*	−5.745
	(4.010)	(5.300)
Crisis = 1	0.036	0.103
	(0.942)	(1.470)
Democracy (Polity)	0.015	0.299**
	(0.109)	(0.149)
Left executive = 1	2.684*	−1.918
	(1.371)	(1.948)
Parliamentary election = 1	0.849	0.750
	(1.095)	(1.291)
War = 1	1.757	−4.526
	(2.634)	(3.799)
Voting with US	2.098	2.706
	(1.330)	(1.855)
Constant	52.656*	73.379**
	(29.912)	(35.377)
Observations	354	354
R^2	0.516	0.537
F Statistic (df = 106; 247)	2.487***	2.708***

This table reports the results of OLS with year and country fixed effects, and standard errors clustered by country. *p<0.1; **p<0.05; ***p<0.01.

In addition to several independent variables already discussed in the main text, these models include the variable *Voting with US*. As the largest IMF shareholder, the US tends to push for less rigorous conditionality enforcement among its allies; thus, US allies might receive a smaller share of natural resource conditionality. To account for this possibility, I employ an ideal point score computed by Bailey et al. (2015), who use voting patterns in the United Nations General Assembly to calculate the absolute distance between the ideal points of two states. Many extant studies (e.g. Stone, 2004; Dreher and Jensen, 2007; Chapman et al., 2017) use equivalent measures to examine how each country relates to the ideal point of the US. Like Bailey et al. (2015), I multiply the ideal point distance by –1 for ease of interpretation, such that larger values of the resulting variable *Voting with US* represent closer positions.

Results show that in country-years under an agreement, the strongest predictor of topic proportions is the resource rents to GDP ratio. GDP per capita is associated with a significant *decrease* in the proportion of natural resource conditions. As Hendrix (2010) shows, GDP per capita is highly correlated with bureaucratic and administrative capacity, which means that these results indicate precisely the opposite of what potential endogeneity patterns would reflect: to the extent that countries can select into natural resource conditionality, they are not doing so based on their bureaucratic or administrative ability to comply with such conditions. Finally, an increase in *Voting with US* is associated with a larger share of natural resource conditionality, which is the opposite of what we would expect if US allies were exempt from such conditions.

E.2 Instrumental Variables Estimation

Instrumental variables generate consistent estimates under two conditions. First, the instrument must satisfy the exclusion restriction: it must affect the outcome (in my case, natural resource policy) exclusively through the treatment (program participation or conditionality), without being correlated with the error term. The validity of the exclusion restriction cannot be justified empirically (Sovey and Green, 2011), but on theoretical grounds.

In the main text, I describe four potential instruments for IMF program participation: (1) the share of a country's nationals among the Fund's professional staff (Barro and Lee, 2005; Casper, 2017); (2) a dichotomous indicator of temporary membership on the United Nations Security Council (Dreher et al., 2009); (3); a measure of the yearly budget constraints faced by the Fund (Barro and Lee, 2005); and (4) an interaction between the yearly IMF liquidity ratio and a country-specific proportion of years under IMF agreement (Stubbs et al., 2020).

Woo (2013), Stubbs et al. (2017), and Rickard and Caraway (2019) only treat selection into program participation, not conditionality, whereas Wei and Zhang (2010), Chapman et al. (2017), and others only treat selection into conditionality, not participation. But Stubbs et al. (2020) highlight the importance of treating selection into both participation *and* conditionality simultaneously, which is why I now turn to instruments for program conditionality.

To instrument for conditionality, widespread options include (1) the number of countries participating in a program each year (Chapman et al., 2017); (2) the ratio of prior IMF financing commitments to IMF quota (Chapman et al., 2017); (3) the total IMF disbursement in a given year (Beazer and Woo, 2016); (4) the number of years left until the next internal

quota review by the IMF board of governors, when a country's borrowing quota might increase (Beazer and Woo, 2016); (5) the size of World Bank loans (Dreher and Vaubel, 2004); (6) real GDP per capita growth in OECD countries (Dreher and Vaubel, 2004); and (6) an interaction between the yearly IMF liquidity ratio and a country-specific average of conditions (Stubbs et al., 2020).

These instruments arguably fulfill the exclusion restriction for several country-specific outcomes, like income inequality (Forster et al., 2019), labor rights (Lee and Woo, 2020), bond yields (Chapman et al., 2017), or education spending (Stubbs et al., 2020), but it is less clear whether this holds for natural resource policy, for reasons outlined in the main text. For example, during the period under study, the IMF liquidity ratio is significantly correlated with real oil prices (in 2021 USD),[23] as is the number of countries under an agreement in a any given year.[24] Temporary UNSC membership is allocated by region, and regional hegemons like Brazil tend to be elected far more frequently than smaller nations like Guyana (Dreher et al., 2015, 125); in any event, one of the countries included in my analysis (Russia) is a permanent member of the UNSC, raising questions about the validity of such instrument. And a higher share of nationals among the IMF professional staff might predict the odds of program participation, but it might also simply reflect the prevalence of neoliberal beliefs among a country's technocratic elite (Nelson, 2014).

Even assuming that the exclusion restriction holds for the instruments discussed above, the second condition to obtain consistent estimates is that said instrument is strongly correlated with the treatment variable in the first-stage equation, conditional on other covariates. As a rule of thumb, the first-stage for each instrument should have an F statistic of at least 10 (though this is contingent on sample size, as Sovey and Green 2011 show). Tables E.2 and E.3 estimate the effect of IMF program participation and natural resource conditionality on short-term and long-term policy, respectively; in each table, Models 1–5 use the instruments proposed by (1) Stubbs et al. (2020), (2) Chapman et al. (2017), (3) Beazer and Woo (2016), (4) Dreher et al. (2009), and (5) Barro and Lee (2005). As both tables show, nearly all instruments have an F statistic below 10. The exception is the compound instrument for resource conditionality (Model 1), with an F statistic of 33.346, but the instrument for participation in the same model has an F statistic of just 0.523.[25] Thus, the potential weakness of instruments might lead to inconsistent estimates, indicating that this estimation strategy is not suitable for my study. Lastly, Wu-Hausman tests indicate that 2SLS is just as consistent as OLS, but these test results are not very meaningful, since the instruments are weak and the precision of the IV estimator is poor.

[23] $\rho = 0.473$, $p = 0.001$.

[24] $\rho = -0.705$, $p = 0.000$.

[25] To obtain F statistics over 10, I could exclude country fixed effects, but this would introduce other potential issues with omitted variable bias.

Table E.2: The Effect of IMF Program Participation and Conditionality on Short-Term Natural Resource Policy, 1980–2019 (2SLS)

	Dependent variable:				
	Short-term policy				
	IV 1: % years under agreement for each country × liquidity ratio, IV 2: % resource conditions for each country × liquidity ratio	*IV 1: None, IV 2: Total number of countries under an agreement each year*	*IV 1: None, IV 2: Total IMF loan disbursement each year*	*IV 1: UNSC temporary member = 1, IV 2: None*	*IV 1: % IMF staff coming from each country, IV 2: None*
	(1)	(2)	(3)	(4)	(5)
IMF program = 1	0.166	0.0003	−0.132	−0.048	0.124
	(0.474)	(0.092)	(0.452)	(0.190)	(0.478)
Resource conditionality (%)	0.033	0.256	3.125	0.198	−0.325
	(0.400)	(2.093)	(9.746)	(0.529)	(1.325)
Previous short-term policy	−0.008	−0.034	−0.021	−0.041	0.005
	(0.089)	(0.032)	(0.064)	(0.035)	(0.074)
Previous long-term policy	−0.032	−0.013	0.009	0.011	−0.045
	(0.065)	(0.027)	(0.077)	(0.035)	(0.074)
Resource rents (% GDP)	−0.0001	−0.0001	−0.0004	−0.0004	−0.0005
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
GDP per capita (USD, log)	0.008	−0.007	0.037	−0.018	−0.003
	(0.059)	(0.029)	(0.129)	(0.019)	(0.020)
GDP growth (%)	0.0003	0.001	0.001	0.0001	0.001
	(0.001)	(0.001)	(0.001)	(0.0005)	(0.001)
Field discovery = 1	0.020	0.026	0.036	0.030	0.016
	(0.024)	(0.020)	(0.036)	(0.024)	(0.024)
Oil price (USD, log)	−0.028	−0.029	−0.011	−0.029**	−0.026*
	(0.018)	(0.025)	(0.084)	(0.013)	(0.014)
Crisis = 1	−0.006	−0.002	−0.010	0.002	−0.005
	(0.018)	(0.012)	(0.039)	(0.012)	(0.012)
Democracy (Polity)	−0.003	−0.002	−0.002	−0.001	−0.002
	(0.004)	(0.001)	(0.003)	(0.002)	(0.002)
Left executive = 1	0.035	−0.001	0.008	−0.014	0.013
	(0.109)	(0.013)	(0.024)	(0.040)	(0.085)
Parliamentary election = 1	−0.002	−0.005	−0.002	−0.003	−0.003
	(0.012)	(0.008)	(0.017)	(0.008)	(0.015)
War = 1	−0.031	−0.030	−0.032	−0.038	−0.030
	(0.026)	(0.021)	(0.031)	(0.027)	(0.034)
Constant	0.051	0.228	−0.180	0.334	0.181
	(0.664)	(0.317)	(1.331)	(0.205)	(0.125)
F statistic for IV 1	0.278	–	–	4.320*	0.681
F statistic for IV 2	31.831***	1.815	0.247	–	–
Wu-Hausman test	0.043	0.010	0.202	0.097	0.049
Observations	2,350	2,350	2,157	2,271	2,180

This table reports the results of 2SLS with third-order polynomials, country fixed effects, and standard errors clustered by country. IV 1 is an instrument for IMF program participation. IV 2 is an instrument for program conditionality.
*p<0.1; **p<0.05; ***p<0.01.

Table E.3: The Effect of IMF Program Participation and Conditionality on Long-Term Natural Resource Policy, 1980–2019 (2SLS)

	Dependent variable:				
	Long-term policy				
	IV 1: % resource conditions for each country × liquidity ratio, IV 2: % years under agreement for each country × liquidity ratio	*IV 1: Total number of countries under an agreement each year, IV 2: None*	*IV 1: Total IMF loan disbursement each year, IV 2: None*	*IV 1: None, IV 2: UNSC temporary member = 1*	*IV 1: None, IV 2: % IMF staff coming from each country*
	(1)	(2)	(3)	(4)	(5)
IMF program = 1	0.391	0.022	−0.178	0.150	0.007
	(0.596)	(0.061)	(0.418)	(0.175)	(0.326)
Resource conditionality (%)	0.415	−0.304	4.050	−0.368	−0.019
	(0.550)	(1.382)	(9.019)	(0.498)	(0.902)
Previous short-term policy	0.076	0.001	0.027	0.013	0.008
	(0.106)	(0.013)	(0.056)	(0.024)	(0.044)
Previous long-term policy	−0.119	−0.077***	−0.056	−0.087***	−0.082
	(0.074)	(0.023)	(0.072)	(0.033)	(0.053)
Resource rents (% GDP)	0.001	0.001*	0.0003	0.001**	0.001
	(0.001)	(0.0004)	(0.001)	(0.0004)	(0.001)
GDP per capita (USD, log)	0.074	0.019	0.078	0.037*	0.022
	(0.074)	(0.018)	(0.122)	(0.019)	(0.014)
GDP growth (%)	−0.0002	0.0004	0.001	−0.0004	0.001
	(0.001)	(0.0005)	(0.001)	(0.0003)	(0.001)
Field discovery = 1	−0.009	0.003	0.015	−0.005	0.004
	(0.026)	(0.012)	(0.031)	(0.016)	(0.016)
Oil price (USD, log)	0.004	−0.011	0.020	−0.008	−0.007
	(0.020)	(0.017)	(0.078)	(0.008)	(0.008)
Crisis = 1	−0.012	0.001	−0.014	−0.003	0.001
	(0.023)	(0.007)	(0.037)	(0.008)	(0.006)
Democracy (Polity)	−0.004	−0.0005	−0.001	−0.001	−0.001
	(0.005)	(0.001)	(0.003)	(0.001)	(0.001)
Left executive = 1	0.098	0.005	0.011	0.035	0.004
	(0.141)	(0.006)	(0.020)	(0.035)	(0.058)
Parliamentary election = 1	0.009	0.001	0.006	0.001	0.001
	(0.015)	(0.005)	(0.017)	(0.005)	(0.009)
War = 1	−0.011	−0.010	−0.002	0.003	−0.005
	(0.034)	(0.008)	(0.022)	(0.018)	(0.015)
Constant	−0.701	−0.068	−0.645	−0.267	−0.094
	(0.831)	(0.191)	(1.250)	(0.190)	(0.090)
F statistic for IV 1	0.278	–	–	4.320*	0.681
F statistic for IV 2	31.831***	1.815	0.247	–	–
Wu-Hausman test	2.121	0.042	0.958	1.573	0.000
Observations	2,350	2,350	2,157	2,271	2,180

This table reports the results of 2SLS with third-order polynomials, country fixed effects, and standard errors clustered by country. IV 1 is an instrument for program conditionality. IV 2 is an instrument for IMF program participation.
*p<0.1; **p<0.05; ***p<0.01.

Table E.4: First-Stage Models for Effect of IMF Program Participation and Conditionality, 1980–2019

	Dependent variable:				
	Resource conditionality (%)				
	IV 1: % resource conditions for each country × liquidity ratio	*IV 1: Total number of countries under an agreement*	*IV 1: Total IMF loan disbursement each year*		
	(1)	(2)	(3)	(4)	(5)
IV 1: conditionality instrument	0.004***	0.0004	−0.0001		
	(0.001)	(0.0003)	(0.0001)		
IMF program = 1		0.044***	0.046***		
		(0.003)	(0.003)		
Previous short-term policy	−0.011***	−0.008**	−0.006*		
	(0.003)	(0.003)	(0.003)		
Previous long-term policy	−0.002	−0.005	−0.007*		
	(0.005)	(0.004)	(0.004)		
Resource rents (% GDP)	0.00004	0.0001	0.0001		
	(0.0001)	(0.0001)	(0.0001)		
GDP per capita (USD, log)	−0.014***	−0.012***	−0.013***		
	(0.003)	(0.003)	(0.004)		
GDP growth (%)	0.00001	−0.00003	−0.0001		
	(0.0001)	(0.0001)	(0.0001)		
Field discovery = 1	−0.002	−0.003	−0.003		
	(0.004)	(0.003)	(0.003)		
Oil price (USD, log)	−0.017***	−0.008*	−0.009*		
	(0.005)	(0.004)	(0.005)		
Crisis = 1	0.002	0.001	0.004		
	(0.003)	(0.003)	(0.004)		
Democracy (Polity)	0.0005	0.0004	0.0003		
	(0.0003)	(0.0003)	(0.0004)		
Left executive = 1	−0.012***	−0.001	−0.002		
	(0.004)	(0.003)	(0.004)		
Parliamentary election = 1	−0.002	−0.001	−0.001		
	(0.003)	(0.003)	(0.003)		
War = 1	−0.002	−0.001	−0.001		
	(0.005)	(0.005)	(0.004)		
Constant	0.192***	0.119***	0.138***		
	(0.035)	(0.036)	(0.039)		

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	Dependent variable:				
	IMF program = 1				
	IV 2: % years under agreement for each country × liquidity ratio			*IV 2: UNSC temporary member = 1*	*IV 2: % IMF staff coming from each country*
	(1)	(2)	(3)	(4)	(5)
IV 2: participation instrument	−0.024			0.065**	−0.025
	(0.036)			(0.030)	(0.028)
Resource conditionality (%)				2.786***	2.767***
				(0.369)	(0.353)
Previous short-term policy	−0.176***			−0.128***	−0.135***
	(0.032)			(0.031)	(0.032)
Previous long-term policy	0.114***			0.126***	0.133***
	(0.037)			(0.037)	(0.034)
Resource rents (% GDP)	0.0002			0.0001	0.001
	(0.001)			(0.001)	(0.001)
GDP per capita (USD, log)	−0.119***			−0.079**	0.044
	(0.031)			(0.032)	(0.039)
GDP growth (%)	0.001			0.001	0.001
	(0.001)			(0.001)	(0.001)
Field discovery = 1	0.034			0.052*	0.030
	(0.032)			(0.031)	(0.029)
Oil price (USD, log)	−0.016			0.010	−0.002
	(0.032)			(0.030)	(0.030)
Crisis = 1	0.030			0.021	0.015
	(0.034)			(0.031)	(0.033)
Democracy (Polity)	0.009***			0.007***	0.003
	(0.003)			(0.002)	(0.003)
Left executive = 1	−0.232***			−0.206***	−0.174***
	(0.032)			(0.030)	(0.032)
Parliamentary election = 1	−0.018			−0.013	−0.023
	(0.020)			(0.019)	(0.020)
War = 1	0.005			−0.027	−0.030
	(0.082)			(0.105)	(0.094)
Constant	1.347***			0.853***	−0.096
	(0.274)			(0.282)	(0.328)
Observations	2,350	2,350	2,157	2,271	2,180

This table reports the results of the first-stage models corresponding to Tables E.2 and E.3, with third-order polynomials, country fixed effects, and standard errors clustered by country.
*p<0.1; **p<0.05; ***p<0.01.

F Results for Selected Time Periods

Table F.1: The Effect of IMF Program Participation on Long-Term Natural Resource Policy, 1995–2019 and 2000–2019

	Dependent variable:			
	Short-term policy	Long-term policy	Short-term policy	Long-term policy
	(1) *1995–2019*	(2) *1995–2019*	(3) *2000–2019*	(4) *2000–2019*
IMF program = 1	0.993***	1.221***	1.410***	1.161***
	(0.251)	(0.251)	(0.241)	(0.196)
Resource conditionality (%)	−0.001	0.021**	−0.003	0.025***
	(0.011)	(0.011)	(0.011)	(0.006)
Previous short-term policy	−2.705***	1.146**	−1.946***	0.463*
	(0.491)	(0.491)	(0.488)	(0.243)
Previous long-term policy	0.178	−6.197***	−0.473	−4.347***
	(0.696)	(0.696)	(0.642)	(0.444)
Resource rents (% GDP)	−0.004	0.035***	−0.006	0.016*
	(0.012)	(0.012)	(0.010)	(0.009)
GDP per capita (USD, log)	0.802	2.757***	2.703***	4.944***
	(0.614)	(0.614)	(0.652)	(0.563)
GDP growth (%)	0.013	0.032***	0.007	0.045***
	(0.008)	(0.008)	(0.008)	(0.005)
Field discovery = 1	0.538*	−0.398	0.406	−0.121
	(0.284)	(0.284)	(0.296)	(0.323)
Oil price (USD, log)	−1.644***	−1.960***	−1.358***	−1.768***
	(0.449)	(0.449)	(0.435)	(0.240)
Crisis = 1	−0.090	0.061	−0.097	0.290
	(0.355)	(0.355)	(0.381)	(0.253)
Democracy (Polity)	0.078*	−0.360***	0.159***	−0.502***
	(0.040)	(0.040)	(0.044)	(0.031)
Left executive = 1	−0.287	−0.410	0.202	0.279
	(0.434)	(0.434)	(0.484)	(0.198)
Parliamentary election = 1	−0.088	0.061	0.025	0.131
	(0.203)	(0.203)	(0.211)	(0.152)
War = 1	−0.467	3.269***	0.218	0.519***
	(0.437)	(0.437)	(0.295)	(0.196)
Constant	−3.200	29.573*	−81.152***	−25.858
	(16.199)	(16.199)	(26.495)	(19.148)
Observations	1,526	1,526	1,201	1,201
Log Likelihood	−194.115	−72.430	−160.000	−63.813
Akaike Inf. Crit.	564.230	320.860	496.000	303.625

This table reports the results of penalized likelihood models with third-order polynomials, country fixed effects, and standard errors clustered by country. Coefficients represent log odds. *p<0.1; **p<0.05; ***p<0.01.

G Results Controlling for Extreme GDP Growth

During the period under study, some countries experienced either extreme economic expansion or extreme economic contraction. For example, according to the World Bank, Equatorial Guinea's GDP grew 149.97 percent in 1997, while Iraq's GDP shrank 64.05 percent in 1991. To account for these outliers (which may or may not be a function of misreported data), I generate two dichotomous variables. For every country-year, if *GDP growth* is above 10 percent, the variable *Extreme expansion* takes the value of one (and zero otherwise). Conversely, if yearly *GDP growth* is below 10 percent, the variable *Extreme contraction* takes the value of one (and zero otherwise). Table G.1 suggests that countries are significantly more likely to pass natural resource policy in times of economic downturn. IMF program participation and conditionality, while highly correlated with these variables, are robust to their inclusion.

Table G.1: The Effect of IMF Program Participation on Long-Term Natural Resource Policy, Controlling for Extreme Values of GDP Growth, 1980–2019

	Dependent variable:			
	Short-term policy	Long-term policy	Short-term policy	Long-term policy
	(1)	(2)	(3)	(4)
IMF program = 1	0.886***	1.139***	0.888***	1.022***
	(0.231)	(0.186)	(0.240)	(0.191)
Resource conditionality (%)			0.0002	0.019***
			(0.011)	(0.006)
Previous short-term policy	−2.946***	1.450***	−2.941***	1.451***
	(0.520)	(0.334)	(0.519)	(0.324)
Previous long-term policy	0.016	−7.089***	0.015	−6.888***
	(0.685)	(0.900)	(0.682)	(0.865)
Resource rents (% GDP)	0.002	0.063***	0.002	0.060***
	(0.012)	(0.010)	(0.012)	(0.010)
GDP per capita (USD, log)	0.082	2.497***	0.083	2.616***
	(0.591)	(0.392)	(0.586)	(0.388)
GDP growth (%)	0.022***	0.028***	0.022***	0.029***
	(0.007)	(0.005)	(0.007)	(0.005)
Extreme expansion = 1	−0.141	−0.142	−0.139	−0.183
	(0.333)	(0.309)	(0.333)	(0.311)
Extreme contraction = 1	1.446***	1.440***	1.446***	1.486***
	(0.459)	(0.192)	(0.457)	(0.195)
Field discovery = 1	0.497*	−0.505	0.496*	−0.499
	(0.273)	(0.424)	(0.273)	(0.408)
Oil price (USD, log)	−2.050***	−1.132***	−2.048***	−1.112***
	(0.321)	(0.247)	(0.319)	(0.243)
Crisis = 1	−0.154	0.224	−0.156	0.170
	(0.349)	(0.193)	(0.346)	(0.188)
Democracy (Polity)	0.002	−0.326***	0.002	−0.323***
	(0.038)	(0.022)	(0.038)	(0.022)
Left executive = 1	−0.449	0.667***	−0.453	0.757***
	(0.402)	(0.179)	(0.400)	(0.184)
Parliamentary election = 1	−0.122	0.057	−0.120	0.059
	(0.200)	(0.179)	(0.199)	(0.176)
War = 1	−0.181	3.824***	−0.184	3.714***
	(0.400)	(0.401)	(0.401)	(0.388)
Constant	7.243	−23.209***	7.219	−23.907***
	(5.254)	(3.634)	(5.197)	(3.605)
Observations	2,350	2,350	2,350	2,350
Log Likelihood	−199.382	−80.868	−199.575	−81.477
Akaike Inf. Crit.	576.764	339.736	579.151	342.953

This table reports the results of penalized likelihood models with third-order polynomials, country fixed effects, and standard errors clustered by country. Coefficients represent log odds. *p<0.1; **p<0.05; ***p<0.01.

H Results Using Count of Conditions

As a robustness check, I manually coded all 6,800 binding conditions based on the presence or absence of words related to natural resources. To do so, I first generated a list of words and expressions, singular or plural, that are related to natural resources: *natural resource, extractive, oil, petroleum, crude, gas, gasoline, diesel, electricity, fuel, fuels, energy, refinery, hydrocarbon, mineral, mining, mine, copper, gold, diamond, iron, steel, phosphate, EITI, Extractive Industries Transparency Initiative, Fund for Future Generations, sovereign wealth fund.* My list also includes the following national oil or mining companies: Sonelgaz (Algeria), Sonangol (Angola), SOCAR (Azerbaijan), Azerigas (sometimes spelled Azerigaz, Azerbaijan), SONABEL (Burkina Faso), SONABHY (Burkina Faso), SNH (Cameroon), SONARA (Cameroon), PETROCA (Central African Republic), SNPC (Congo), SOGARA (Gabon), PETROCI (Ivory Coast), SOMAGAZ (Mauritania), SONIDEP (Niger), NNPC (Nigeria), Gazprom (Russia), Ukrgazprom (Ukraine), OTP (Togo), Naftogaz (sometimes spelled Naftogas, Ukraine), and PDVSA (Venezuela). Every one of the 6,800 conditions was coded one if it included at least one of these words, and zero otherwise. Conditions that only mentioned *vegetable* oil (for example, palm oil) were coded as zero, as were conditions that referred to economic sectors *excluding the energy, gas, oil, or mining sector.* Through this manual coding, I was able to identify 418 natural resource conditions, which I grouped by country and year to generate the variable *Resource conditionality (count).* This variable ranges from zero to 23.

Table H.1 reports the results of models using the *count* of natural resource conditions, rather than the *proportion* of conditions covering the natural resource topic (as in Table 4). The effects are similar in direction and statistical significance, though the coefficient for the topic proportions is far more conservative. Given the equivalence of results and the fact that automated text analysis is much less time-consuming than manual coding, I present the effect of topic proportions in the main text.

Table H.1: The Effect of IMF Program Participation and Conditionality on Natural Resource Policy (Count of Binding Conditions), 1980–2019

	Dependent variable:	
	Short-term policy	Long-term policy
	(1)	(2)
IMF program = 1	0.945***	1.147***
	(0.232)	(0.194)
Resource conditionality (count)	−0.067	0.114***
	(0.080)	(0.031)
Previous short-term policy	−2.851***	1.601***
	(0.515)	(0.339)
Previous long-term policy	−0.053	−7.315***
	(0.683)	(0.942)
Resource rents (% GDP)	0.0005	0.063***
	(0.011)	(0.011)
GDP per capita (USD, log)	−0.076	2.045***
	(0.582)	(0.402)
GDP growth (%)	0.015**	0.025***
	(0.008)	(0.005)
Field discovery = 1	0.473*	−0.531
	(0.274)	(0.442)
Oil price (USD, log)	−2.010***	−1.167***
	(0.321)	(0.252)
Crisis = 1	−0.087	0.146
	(0.339)	(0.199)
Democracy (Polity)	0.007	−0.340***
	(0.038)	(0.023)
Left executive = 1	−0.452	0.665***
	(0.401)	(0.184)
Parliamentary election = 1	−0.109	0.063
	(0.201)	(0.178)
War = 1	−0.205	4.215***
	(0.405)	(0.465)
Constant	8.424	−20.019***
	(5.165)	(3.661)
Observations	2,350	2,350
Log Likelihood	−199.373	−80.238
Akaike Inf. Crit.	574.746	336.476

This table reports the results of penalized likelihood models with third-order polynomials, country fixed effects, and standard errors clustered by country. Coefficients represent log odds. *p<0.1; **p<0.05; ***p<0.01.