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Rules, Rents and Restraints: Fiscal Stability and Resource Dependency

An Analysis of Botswana, 1990–2022

by

Elise Benedikte Authen

el17673au-s@student.lu.se

Botswana's reputation as a beacon of fiscal prudence in resource-rich economies faces new challenges. Yet recent pressures—rising debt, declining surpluses, and fiscal volatility—raise questions about the long-term sustainability of this model. This thesis examines how Botswana's fiscal capacity has shaped its ability to manage natural resource wealth between 1990 and 2022. Drawing on a composite Fiscal Sustainability Index (FSI), the study traces shifts in revenue mobilisation, expenditure patterns, and debt dynamics. Structural break analysis identifies 2009 and 2018 as key inflection points, marking a departure from earlier rule-based discipline. Regression analysis reveals a weakening link between fiscal stability and governance, suggesting that the institutional foundations that once insulated Botswana from the resource curse are now under strain. In doing so, the thesis offers a replicable framework for assessing fiscal resilience in other resource-dependent countries.

Keywords: Fiscal Capacity, Resource Dependency, Structural Breaks

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Contents

1	INTRODUCTION	1
2	CONTEXT	5
2.1	Structural Constraints and Exceptional Growth	5
2.2	Governance and Fiscal Planning	6
2.3	External Shocks and the Global Resource Cycle, 1990-2022	7
3	LITERATURE REVIEW	8
3.1	The Resource Curse: Theory and Empirical Patterns	8
3.2	Fiscal Sustainability in Resource-Rich Economies	9
3.3	Colonial Fiscal Legacies	11
3.4	Operationalisation of Literature	12
4	EMPIRICAL STRATEGY	14
4.1	Constructing the Fiscal Sustainability Index	14
4.2	Structural Breaks and Fiscal Behaviour	15
4.3	Regression Analysis	16
4.4	Limitations and Considerations	17
5	RESULTS AND DISCUSSION	18
5.1	Descriptive Fiscal Statistics	18
5.2	Fiscal Volatility and the Role of Fiscal Capacity	24
5.3	Structural Shifts in Fiscal Policy	27
5.4	Institutions and the Fiscal–Governance Nexus	29
5.5	Summary of Findings	35
6	CONCLUSION	38
	References	41
A	Robustness Checks	i
B	Disaggregated Governance Regressions	iii
C	PCA Variations	vii
D	Benchmarking Botswana	ix
E	Governance–Fiscal Feedback Loop	xii
F	AI Statement	xiii

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1 INTRODUCTION

[Smith \(1776\)](#) argued that the pursuit of mineral wealth is among the most hazardous of economic endeavours. He cautioned that such ventures were often costly, uncertain, and liable to ruin those who engaged in them. Consequently, Smith described gold and silver mining as the riskiest of all undertakings, warning that a prudent lawgiver would do well to avoid encouraging such speculation. Similar warnings appear in the work of Ricardo and Machiavelli (see, e.g., [McCormick \(2001\)](#); [Armitage and Skinner \(2013\)](#); [Karl \(1997\)](#)), both of whom observed that natural resource wealth can lead to complacency, governance failure, and economic decline.

These classical insights have found renewed relevance in development economics, where a large literature has documented the so-called *resource curse*—the paradox wherein countries rich in natural resources tend to grow more slowly, perform more poorly institutionally, and struggle to achieve long-term economic stability. The resource curse debate has unfolded alongside a broader theoretical divide between two dominant schools of thought: one attributing long-run development to the quality of institutions, the other to geographical and resource endowments. Geographical determinists (e.g. ([Sachs, 2003](#); [Gallup et al., 1999](#))) maintain that factors like landlockedness, resource dependency, and disease ecology shape a country’s developmental prospects, whereas institutionalists (e.g. [Acemoglu et al. \(2005\)](#); [North et al. \(2006\)](#)) argue that inclusive, rule-based institutions underpin economic growth. An important dimension of institutional strength is fiscal capacity, defined by [Frankema and Booth \(2020\)](#) as “the ability of the state, or its representative agents, to collect revenues in order to provide public goods and services” (p. 1). In the African context, the fiscality of the state has often been seen as central to post-colonial state formation; as Cabral put it, it is “a root cause of the oft-diagnosed ‘failure of African independence’” ([Cabral, 1973](#), p. 43). For resource-rich economies, however, building fiscal capacity presents particular challenges ([Moore, 2004](#)). States heavily reliant

on natural resource endowments often raise significantly less revenue from broad-based domestic taxation compared to states that depend on taxing economic activity (Bräutigam, 2008; Bornhorst et al., 2008). Furthermore, as states may lack the institutional strength to “extract and deploy resources, enforce property rights, and resist demands of rent seekers” (van der Ploeg, 2011, p. 393) resource windfalls often exacerbate corruption and rent-seeking, especially in contexts of institutional fragility.

Botswana occupies an important position in this debate. While many resource-rich African nations have struggled to convert mineral wealth into sustainable development, Botswana is praised as Africa’s *sparkling diamond* (Herrmann, 2019), and remains the world’s largest diamond producer by value (Statista, 2025). At independence in 1966, it was among the poorest countries in the world (Hillbom, 2008). Entirely landlocked, semi-arid, and lacking infrastructure, it had seen minimal colonial investment. Yet it has achieved the world’s highest growth rate since 1960 (Mehlum et al., 2006), the lowest corruption rates in Africa (Transparency International, 2023), “on par with Western Europe” (Hillbom, 2008, p. 192), and macroeconomic stability. This achievement—widely attributed to institutional strength (Acemoglu et al., 2003; Acemoglu and Robinson, 2012)—lies in the long-term avoidance of many symptoms of the resource curse (Mehlum et al., 2006). However, its growth is also undeniably rooted in the country’s exceptional diamond endowment (Karstens, 2021)—a high-value, low-bulk commodity that is less prone to looting and more amenable to state capture and export. Rather than falling neatly into one theoretical camp, Botswana exemplifies the complex interaction between resource endowments and the quality of institutions.

Nevertheless, the image of exceptionalism has come under increasing scrutiny. Scholars such as Good argue that Botswana’s apparent success masked deeper structural vulnerabilities and elite capture (Good, 1994). By the 1990s, corruption and mismanagement had become more visible, with scandals involving land, procurement, and public finance institutions. Economic diversification has also lagged: mining continues to dominate, manufacturing stagnated around 4% of GDP, and agriculture declined from 40% to under 2% between 1968 and 2006. As Hillbom (2008) notes, “the government’s efforts to diversify have failed, and left the economy vulnerable in the long term” (p. 196). These concerns are compounded by continued structural dependence on diamond revenues, a narrowing tax base, and the erosion of fiscal surpluses in recent years.

These developments raise the question of whether Botswana’s early success reflects structural resilience or merely a temporary reprieve from deeper vulnerabilities. A large body of literature on resource-rich economies points to how natural wealth may hinder long-term development—through volatility, Dutch Disease, procyclical spending, and rent-seeking. Botswana is often described as a rare exception, and while institutional quality and geography undoubtedly underpinned early outcomes, its rule-based budgeting and prudent

fiscal management have led many to frame it as a model of fiscal strength in sub-Saharan Africa. Yet, while institutional factors are frequently invoked, there has been less attention to how fiscal policy itself has responded to volatility—or whether the current model remains sustainable. In this sense, fiscal capacity offers a sharper analytical lens for evaluating whether Botswana has truly escaped the resource curse—or whether its effects have simply been postponed.

This thesis builds on that gap by examining how fiscal capacity—operationalised through a composite index of fiscal sustainability¹—has shaped Botswana’s ability to manage resource dependence. It focuses on how fiscal tools, such as taxation, budgeting rules, and long-term planning, have supported or constrained macroeconomic stability and institutional quality over time. Rather than evaluating whether Botswana escaped the resource curse, the study situates the country within the concept of a *resource trap*² (Hillbom, 2015), where early achievements coexist with persistent structural vulnerabilities.

In exploring the role of fiscal capacity in shaping how Botswana has managed its natural resource wealth over time, this thesis asks: *How has fiscal capacity shaped Botswana’s ability to manage natural resource wealth over time?* To answer this, the study considers three guiding sub-questions

- To what extent has fiscal capacity helped mitigate volatility and promote long-term stability?
- How have shifts in Botswana’s fiscal trajectory corresponded with identifiable structural breaks related to external shocks or institutional reforms?
- How has the relationship between fiscal performance and institutional quality evolved over time?

These questions guide the empirical analysis, which centres on a Fiscal Sustainability Index (FSI) capturing trends in revenue mobilisation, expenditure discipline, and debt management from 1990 to 2022. The index is constructed using principal component analysis (PCA) on fiscal indicators derived from national data from the annual reports provided by the Bank of Botswana. Structural break tests and a Fiscal Reaction Function identify shifts in fiscal behaviour, while regression analysis links the FSI to institutional quality using World Governance Indicators (WGI). The 1990–2022 period was chosen

¹Fiscal capacity refers to the state’s institutional ability to raise and manage public revenue—primarily through taxation. Fiscal sustainability, by contrast, captures the long-term solvency and stability of public finances. While related, the former is an input; the latter is an outcome.

²While Botswana is often described as having avoided the Dutch Disease and the resource curse, the concept of a resource trap better captures the country’s structural constraints. Unlike the classic Dutch Disease scenario, Botswana never developed a strong tradable manufacturing sector that could be “crowded out” by resource wealth. Instead, long-term dependence on diamond revenues and limited diversification options have produced vulnerabilities consistent with a broader understanding of resource-based stagnation (see Hillbom, 2015).

to maximise data availability and encompass institutional developments and external shocks, including the introduction of fiscal rules, the creation of the Pula Fund, episodes of elevated diamond revenues, and global disruptions such as the 2008 financial crisis and the COVID-19 pandemic.

The analysis reveals a nuanced trajectory for Botswana’s fiscal sustainability. The FSI illustrates a period of robust fiscal management in the 1990s and early 2000s, characterised by budget surpluses, low debt ratios. However, from 2008 onwards, the FSI indicates a decline in fiscal stability driven by declining tax revenue-to-GDP ratios, increased expenditure volatility, and a growing debt burden. Structural break analysis identifies 2009 and 2018 as critical inflection points, aligning with external shocks such as the global financial crisis and fluctuations in diamond revenues, while the Fiscal Reaction Function results suggest that fiscal policy has become less responsive to debt accumulation, indicating a drift away from the earlier rule-based framework.. Regression analysis further shows that the link between fiscal sustainability and institutional quality is robust, and their trajectories move in tandem.

Overall, the findings suggest that while Botswana successfully institutionalised fiscal restraint in the early post-independence period, the model has become increasingly fragile under conditions of sustained resource dependency and external volatility. This evolving dynamic shows the broader challenge of maintaining fiscal resilience in resource-dependent economies over the long term. Although limited to a single country, the findings speak to broader challenges faced by resource-rich economies, especially in Africa, where volatility and institutional constraints often co-exist. Methodologically, the thesis develops a replicable approach to assessing fiscal sustainability in resource-rich contexts, using a composite index grounded in IMF benchmarks.

The following section provides a historical overview of Botswana’s economic development, focusing on its natural resource endowment and the evolution of its fiscal framework, and of the world economy during the period 1990 to 2022. Section 3 reviews the relevant literature on resource wealth, fiscal sustainability, and institutional responses to resource dependence, including an operationalisation of the literature, drawing on IMF fiscal policy recommendations for resource-rich countries. Section 4 presents the empirical strategy, including the construction of a FSI, the application of structural break analysis, and the OLS regressions. Section 5 presents and discusses the empirical results. Finally, section 6 concludes the thesis by summarising the findings and reflecting on their broader implications for fiscal governance in resource-rich economies, as well as potential directions for future research.

2 CONTEXT

The following sections trace the development of Botswana’s fiscal architecture, focusing first on the institutional foundations of its mineral governance, and then on how this model responded to external shocks and evolving global constraints.

2.1 Structural Constraints and Exceptional Growth

The physical and institutional legacies of colonialism offered little foundation for economic growth: the economy was primarily based on subsistence agriculture and cattle ranching, and the country had minimal infrastructure, only 12 kilometers of paved roads, and limited access to health and education services (Bolt and Hillbom, 2018; Hillbom, 2015). Just one year after independence, in 1967, the discovery of the Orapa diamond mine marked an important turning point in Botswana’s development trajectory (de Wit, 2018; Manyathi, 2023). This discovery, and subsequent ones at Jwaneng and Letlhakane, would go on to shape the economic and fiscal foundations of the country for decades.

Instead of falling into the trap of rentierism or corruption, the government, under the leadership of Seretse Khama and later Quett Masire, negotiated a 50/50 joint venture with De Beers³ that ensured a consistent and transparent flow of mineral rents into the public budget (Bolt and Hillbom, 2018; Hillbom, 2012). However, in contrast to e.g. Sierra Leone—where shallow, alluvial diamond deposits are easily accessible and have become a source of financing for rebel groups—Botswana’s diamonds are embedded in deep kimberlite pipes, requiring substantial capital investment, geological expertise, and centralised control (Lujala et al., 2005; Boel, 2017). This geological difference limited opportunities for illicit mining and enabled stronger state oversight. By asserting state ownership over subsoil resources and centralising mineral revenues, Botswana was able to avoid the fragmented and contested revenue systems seen in many other resource-rich states (Iimi, 2006; Leith, 2005). Importantly, the diamond boom occurred after Botswana had achieved independence⁴. This meant that the newly sovereign state retained control over its mineral wealth and was able to negotiate the terms of extraction and revenue sharing with foreign partners (Hillbom, 2015).

What distinguished Botswana’s early leadership was its long-term vision and political restraint. Rather than using diamond revenues for short-term political gain, the government adopted a cautious and technocratic fiscal approach (Adeodun, 2024; Bolt and Hillbom, 2018; Ndlovu, 2016). Revenues were channelled into physical infrastructure, health, and

³De Beers is a multinational mining company historically dominant in the global diamond trade. In Botswana, it entered into a joint venture with the government in 1969, forming Debswana (Debswana, 2024)

⁴“Possibly the government knew already before independence that valuable diamond deposits existed in Botswana” (Hillbom, 2015, p. 7)

education—investments that supported both growth and institutional development. At the same time, the ruling Botswana Democratic Party (BDP) maintained strong control and sound fiscal decisions while resisting populist spending pressures. This combination of elite consensus, state capacity, and mineral revenue provided the foundation for a state that, while modest in scope, proved stable and effective.

This exceptionalism has been widely attributed to a confluence of historical, institutional, and political factors (see e.g. [Acemoglu et al. \(2001\)](#); [Taylor \(2012\)](#)). Inclusive precolonial institutions, such as the *kgotla*⁵ tradition of public consultation, laid early foundations for accountability. British colonialism, though extractive in design, had minimal administrative presence in the Bechuanaland Protectorate, leaving traditional authority structures largely intact ([Bolt and Hillbom, 2018](#)). At independence, the ruling elite—anchored in the BDP—pursued a pragmatic, long-termist development agenda grounded in fiscal conservatism, legal predictability, and restrained political competition.

2.2 Governance and Fiscal Planning

According to [Leith \(2005\)](#), Botswana’s fiscal policies have been marked by long-term development planning that set the foundation for managing the country’s resources sustainably. This process involved multi-year planning for expenditures, which became more sophisticated over time. The development planning process was initially influenced by the need to manage external financing from international donor agencies, which played a crucial role in shaping Botswana’s fiscal policies during the early post-independence years ([Leith, 2005](#)). Botswana’s government progressively implemented more structured approaches to economic management, which included spending ministries and state-owned enterprises formulating recurrent and capital expenditure plans with an aim towards sustainability ([Hillbom, 2008](#); [Bolt and Hillbom, 2018](#)).

A key element of this fiscal discipline was the extensive consultative process. Botswana’s government prioritised inclusivity in policy-making, with senior officials and ministers meeting regularly to resolve major policy issues, culminating in the adoption of the National Development Plans (NDPs) by Parliament ([Leith, 2005](#)). This consultative process ensured that the fiscal planning framework was not only comprehensive but aligned with long-term national goals. The NDPs, supported by annual and mid-plan reviews, allowed the government to make necessary adjustments to its fiscal path, maintaining macroeconomic stability and avoiding the common pitfalls of unsustainable debt and resource mismanagement that have often plagued other resource-rich countries ([Leith, 2005](#); [Hillbom, 2008](#)).

In addition to its well-articulated fiscal planning, the prudent management of diamond

⁵traditional public assembly system in Tswana culture

revenues stands as one of the most lauded aspects of Botswana’s success. The government’s ability to manage diamond incomes effectively during periods of economic booms, while also building foreign exchange reserves to compensate for bust years (Hillbom, 2008, 2015; Leith, 2005) was essential to maintaining economic stability. This approach was crucial in insulating the economy from global commodity price fluctuations, allowing Botswana to maintain consistent public spending and continue investments in critical sectors like infrastructure, education, and healthcare (Hillbom, 2012). These investments laid the foundation for sustained social development alongside economic growth.

The government has also shown great prudence in the management of diamond incomes, and through fiscal policy the government has avoided external debt problems (Hillbom, 2015). This insight—that Botswana’s fiscal stability was not incidental but strategically constructed—is further explored by Bolt and Hillbom (2018). The country did not escape the risks of resource dependence, but actively institutionalised mechanisms to manage them. Rather than attempting to diversify prematurely or rely on ad hoc responses to volatility, Botswana embedded its mineral reliance within a disciplined and forward-looking fiscal framework. This included the implementation of multi-year NDPs (Leith, 2005), the formal separation between recurrent and development expenditure (IMF, 2011; Jefferis, 2014), and a strong emphasis on running fiscal surpluses during boom periods (Iimi, 2006; Hillbom, 2008). These principles were not only codified in planning documents but became embedded in the logic of fiscal governance. Taken together, they allowed Botswana to mitigate the procyclical tendencies typical of mineral economies, contain spending pressures, and channel resource revenues into long-term investment. In contrast to many resource-rich peers, Botswana’s fiscal architecture was not reactive, but pre-emptive—designed to stabilise the state around a volatile and exhaustible revenue base.

2.3 External Shocks and the Global Resource Cycle, 1990-2022

Botswana’s fiscal trajectory has not only been shaped by domestic institutions and political choices but has also been deeply conditioned by its exposure to the global resource cycle (IMF, 2010a,b; Patel, 1992; Boel, 2017; IMF, 2023; Bank of Botswana, 2008). As an economy heavily reliant on diamond exports, which have accounted for almost 90 percent of goods exports over the past decade (IMF, 2023) and contribute significantly to GDP and revenue (Boel, 2017), Botswana is structurally vulnerable to external volatility. This vulnerability stems from fluctuations in commodity markets and shifts in global demand for rough diamonds.

Between 1990 and 2022, a series of global disruptions profoundly affected Botswana’s external environment (IMF, 2010a,b; Boel, 2017; IMF, 2023; Bank of Botswana, 2008). The period leading up to the 2008 crisis, particularly the early 2000s, was characterised by high mineral prices, resulting in large fiscal and external surpluses (IMF, 2010a,b) and

the accumulation of substantial savings (IMF, 2010a,b; Bank of Botswana, 2008). The period of buoyant diamond exports and significant revenue inflows enabled Botswana to accumulate savings, partly in the Pula Fund (Boel, 2017; IMF, 2023) building buffers.

The 2008 global financial crisis had a severe impact on Botswana, primarily through a collapse in diamond demand (Bank of Botswana, 2008; IMF, 2010a,b). The resulting economic contraction led to sharp fiscal and external deficits. In response, the government adopted a countercyclical stance, drawing on reserves accumulated during earlier booms to sustain public spending and support recovery (Bank of Botswana, 2008; IMF, 2010b). While this initially cushioned the economy, mineral revenues remained below pre-crisis levels, and persistent deficits gradually eroded fiscal buffers. By the mid-2010s, concerns over rising public spending and debt service obligations were mounting (IMF, 2011; Jefferys, 2014). This growing fragility left Botswana less equipped to absorb subsequent shocks. When the COVID-19 pandemic hit, it exacerbated existing vulnerabilities, causing a contraction in key sectors, notably diamonds and tourism, a sharp decline in mineral revenues (IMF, 2023), and a widening fiscal deficit. This led to increased public debt and a widening current account deficit, and exposed the limits of reliance on natural resource revenues (Bank of Botswana, 2008; IMF, 2010a,b).

3 LITERATURE REVIEW

The literature on the political economy of natural resource wealth in Africa can be organised into three key strands: theories and empirical evidence on the resource curse; fiscal sustainability in resource-rich countries; and debates surrounding colonial fiscal legacies. These strands provide the basis for operationalising the literature and identifying the analytical gap this thesis seeks to address.

3.1 The Resource Curse: Theory and Empirical Patterns

The idea that natural resource wealth can undermine rather than promote economic development is now well established in the literature. Early contributions by Auty (1993) and Sachs and Warner (1995, 2001) argue that resource-rich countries tend to grow more slowly than resource-poor ones, attributing this to a combination of structural economic effects and institutional weaknesses. In particular, Sachs and Warner (1995, 2001) emphasise the tendency of resource booms to induce real exchange rate appreciation, which undermines the competitiveness of non-resource sectors—widely known as Dutch Disease⁶.

Initially, the resource curse was presented as a relatively deterministic outcome: resource

⁶Dutch Disease refers to the economic phenomenon where a resource boom—typically in oil, gas, or minerals—causes a real exchange rate appreciation, making other tradable sectors like manufacturing or agriculture less competitive. The term originated in the 1970s to describe the decline of Dutch manufacturing following natural gas discoveries in the North Sea (Corden & Neary, 1982)

abundance led to poor development. However, later research introduced important qualifications. The impact of resource wealth is heavily dependent on institutional quality (Mehlum et al., 2006). In countries with weak or *grabber-friendly*⁷ institutions, resource rents tend to be captured through rent seeking and corruption. In contrast, where institutions are *producer-friendly*⁸, resource revenues can be harnessed productively to support long-term development (Mehlum et al., 2006). This distinction raises questions to the deterministic models, and leads towards models more contingent on explanations.

More recent work has further broadened the analytical scope, emphasising the interplay between fiscal institutions, macroeconomic management, and political economy. van der Ploeg (2011) identifies a wider range of vulnerabilities associated with resource wealth, including macroeconomic volatility, fiscal procyclicality, and underinvestment in state capacity. These risks are not inherent to natural resources themselves but arise from how resource revenues are managed—whether they are stabilised, saved, or politicised. The focus has therefore shifted toward the institutional and fiscal mechanisms that mediate the effects of resource dependence. While the risks of volatility, short-sighted policymaking, and rent-driven governance are well documented, such outcomes are neither inevitable nor irreversible. The current literature increasingly frames resource wealth not as a deterministic curse, but as a governance challenge—one whose outcomes depend on how fiscal rules are designed, how budgets are formulated, and how states build capacity to manage shocks over time.

This shift sets the stage for a more nuanced concept of the resource trap (Hillbom, 2015). While some countries may avoid the most damaging aspects of the resource curse, they may remain fiscally vulnerable due to persistent dependence on extractive revenues, weak diversification, and shallow domestic tax bases. The trap lies not in collapse, but in the long-term difficulty of escaping structural dependence. It is within this that Botswana’s experience is revisited; not as a simple success story, but as a case where early restraint may have postponed, rather than eliminated, underlying vulnerabilities.

3.2 Fiscal Sustainability in Resource-Rich Economies

The fiscal challenges associated with natural resource wealth are widely recognised. Resource-rich economies are often characterised by volatile revenues, procyclical spending behaviour, and heightened vulnerability to unsustainable fiscal paths (van der Ploeg, 2011; IMF, 2012). These patterns are driven by the inherent characteristics of resource rents: they are highly volatile, exhaustible, and subject to external price shocks over which gov-

⁷Institutions that enable or incentivise rent-seeking behaviour, such as corruption, patronage, or political capture, by making it more profitable to appropriate wealth than to create it (Mehlum et al., 2006).

⁸Institutions that support productive economic activity by securing property rights, limiting elite predation, and fostering investment in public goods and infrastructure (Mehlum et al., 2006). Botswana is classified as having producer-friendly institutions.

ernments have limited control ([Frankel, 2011](#); [Cuddington and Zellou, 2012](#)). As a result, fiscal policy in such settings faces a dual imperative—managing short-term volatility while ensuring long-term sustainability ([IMF, 2017](#)).

Volatility remains the most immediate fiscal challenge for resource-rich economies. Because resource revenues are highly sensitive to global commodity prices, government budgets are frequently exposed to sharp and unpredictable swings ([Frankel, 2011](#); [van der Ploeg and Poelhekke, 2010](#)). In the absence of credible stabilisation mechanisms, these shocks often give rise to boom-bust spending patterns, i.e. rapid expenditure growth during upswings, followed by abrupt cuts during downturns ([IMF, 2012](#)). Such cycles not only undermine macroeconomic stability but also erode fiscal credibility and complicate multi-year budget planning ([Cevik and Teksoz, 2014](#)).

Exhaustibility poses a more structural, long-term challenge. Unlike other forms of public revenue, resource rents are finite and non-renewable. If governments treat them as permanent income, they risk creating structural fiscal imbalances that emerge once production declines or resource depletion sets in ([IMF, 2012](#); [Cuddington and Zellou, 2012](#)). To address this, the IMF and other policy institutions advocate fiscal frameworks that treat resource revenues as temporary windfalls and windows of opportunity rather than stable income ([IMF, 2017](#)).

To operationalise the principles of sustainability and intertemporal equity, many resource-exporting countries have adopted fiscal rules designed to stabilise expenditure and anchor long-term fiscal discipline. These include ceilings on non-resource primary balances, debt thresholds, and structural budget balance rules that adjust for commodity price cycles ([IMF, 2012](#); [Bova and Poghosyan, 2014](#)). Simultaneously, several countries have established sovereign wealth funds (SWFs) to delink public spending from volatile resource revenues. These funds serve multiple objectives—saving for future generations, providing short-term stabilisation buffers, and promoting intergenerational equity—but their effectiveness is highly contingent on the credibility and transparency of surrounding institutions ([Arezki et al., 2015](#)). Without strong governance frameworks, SWFs and fiscal rules risk becoming procyclical or politically circumvented, rather than acting as true stabilisers.

Established in 1994, Botswana’s Pula Fund was conceived as a SWF to preserve a portion of the country’s mineral wealth for future generations. Managed by the Bank of Botswana, it functions as a long-term investment portfolio and a component of the nation’s foreign exchange reserves ([Bank of Botswana, 2025b](#)). Its principal objectives are to cushion the economy against external shocks and to promote intergenerational equity by saving a share of diamond revenues. The Pula Fund has been important in stabilising Botswana’s economy during periods of volatility, notably during the global financial crisis of 2008–2009, when it was drawn upon to finance budget deficits amid declining mineral

revenues (IMF, 2010a). However, in recent years, the fund’s assets have eroded due to factors such as reduced diamond output and increased government spending, which ultimately raise concerns about its long-term viability as a fiscal stabilisation mechanism (IMF, 2024)

3.3 Colonial Fiscal Legacies

Although recent work has increasingly addressed the fiscal histories of African and Asian colonial contexts (e.g. Booth 2007a; Frankema 2011; Gardner 2012; Wahid 2013; Frankema & van Waijenburg 2014; Huillery 2014; Alexopoulou & Juif 2017, cited in Frankema and Booth (2020)), these contributions have yet to be brought together into a broader, synthesised framework. As noted by Frankema and Booth (2020), the literature has predominantly focused on the emergence of fiscal states in Europe and their extensions in the Americas, paying comparatively less attention to how fiscal institutions evolved in African and Asian colonies and protectorates.

Mkandawire (2010) argues that different colonial economies—whether defined by labour reserves, cash crops, or concession systems—left distinct legacies in state capacity, tax structure, and informality. While colonial fiscal systems across Africa shared common features of extractive intent and institutional neglect, they also reflected significant diversity rooted in local conditions, administrative pragmatism, and colonial bargaining. Recent studies have shown that these systems cannot be wholly understood through rigid dichotomies such as *British vs. French* or *extractive vs. developmental rule*. Frankema and van Waijenburg (2014), for instance, argue that metropolitan blueprints mattered less than previously assumed; fiscal institutions were often shaped more by local constraints than by colonial ideology, with both British and French administrators converging in practice under similar economic pressures. This perspective complicates earlier assumptions about the predictability of colonial governance and highlights the importance of context-specific analysis.

Botswana is interesting in this regard. As Ndlovu (2016) and Gardner (2012) show, colonial taxation in the Bechuanaland Protectorate was not merely an imposition from above but rather the outcome of negotiated arrangements between British officials and Tswana elites. The *hut tax*⁹, a ubiquitous tool of early colonial finance, was initially collected through chiefs, who retained a commission—thereby embedding colonial revenue collection within pre-existing systems of authority. However, over time, British administrators consolidated control over both the terms and administration of taxation, shifting from household-based levies to individual poll and graded taxes in the interwar period. These

⁹The hut tax was a colonial levy imposed on African households, typically payable per dwelling or adult male. In Botswana, it was introduced in 1899 and initially collected through chiefs, who retained a commission. It served both as a source of revenue and a mechanism to integrate local populations into the colonial economy (Ndlovu, 2016; Makgala, 2004).

changes were justified through evolving definitions of fairness and administrative rationality, but they also reflected a growing desire to widen the colonial revenue net in the face of economic pressures (Ndlovu, 2016; Gardner, 2012). Ndlovu (2016) further shows that this system constituted what Lieberman would classify as a *skeletal tax state*, marked by administrative fragmentation, minimal reach, and a weak capacity to tax the wealthier segments of society. The colonial state lacked a central bureaucracy and was focused less on developmental goals than on controlling populations at low cost.

Following independence in 1966, Botswana inherited a fragmented and regressive tax system, shaped by colonial minimalism and indirect rule (Ndlovu, 2016). The early post-colonial state faced the dual challenge of building fiscal capacity while navigating an aid-dependent budget and limited administrative reach. The introduction of the Income Tax Act in 1973 marked the beginning of a modern tax regime, consolidating disparate colonial laws and aiming to reduce dependence on customs revenues and foreign assistance. Yet the discovery and exploitation of diamonds in the 1970s shifted the structure of public finance: mineral rents soon eclipsed other revenue sources, dampening the urgency for broad-based taxation. The postcolonial tax state remained shaped by the institutional legacies of its predecessor—strong on stability, yet constrained in scope.

3.4 Operationalisation of Literature

The framework employed in this thesis adopts the IMF’s fiscal policy framework (IMF, 2012) as its principal lens for assessing Botswana’s fiscal sustainability. Specifically tailored to the challenges of resource-rich developing economies, the framework provides both normative guidance and operational benchmarks for managing commodity-related revenue volatility, maintaining macroeconomic stability, and safeguarding long-term fiscal health. This focus is particularly pertinent given the fiscal challenges outlined in the broader literature on the resource curse (Sachs and Warner, 2001), volatility and procyclicality (Frankel, 2011; van der Ploeg, 2011), and institutional fragility (Mehlum et al., 2006).

The IMF outlines six core principles for fiscal policy in resource-rich developing countries (IMF, 2012). These have been consolidated into a set of evaluative criteria, as seen in Table A1, and will be used to foreground the subsequent discussion in Section 5.

Table 1: Analytical Criteria Derived from IMF Fiscal Framework

Nr	Name	Conceptual Focus	Relevance for Analysis
1	Fiscal Sustainability	Aligning expenditure with long-term revenue to ensure stability	Assesses long-run fiscal credibility given reliance on finite resource wealth.
2	Macroeconomic Stability	Managing shocks and preventing procyclical behaviour	Examines whether fiscal rules and buffers stabilised spending during downturns.
3	Precautionary Savings	Using buffers to smooth expenditure under uncertainty	Analyses the role of the Pula Fund in sustaining spending and avoiding sharp adjustments.
4	Expenditure Flexibility	Scaling investment without weakening discipline	Evaluates the ability to invest in development while avoiding inflation or excess debt.
5	Absorptive Capacity	Institutional and macro constraints on effective public spending	Informs analysis of implementation limits, especially in infrastructure and public services.
6	Resource Fund Integration	Embedding funds within the fiscal framework	Assesses whether fund governance reinforced or undermined fiscal discipline.

The first set of criteria—fiscal sustainability and precautionary savings—are examined in relation to Botswana’s ability to maintain long-term solvency amid revenue volatility and declining buffers. This analysis, corresponding to the first research question, draws on trends in tax revenue, fiscal balance, and debt servicing, as captured by the FSI. It also considers the state’s use of savings mechanisms such as the Pula Fund to cushion against fiscal shocks and maintain expenditure stability. The second research question—on how fiscal trajectories have shifted in response to external shocks and institutional reform—is addressed through the lens of macroeconomic stability and resource fund integration. Finally, the third research question is addressed through the criteria of absorptive capacity and expenditure flexibility, which are used to interpret Botswana’s capacity to convert

resource wealth into long-term developmental investment.

4 EMPIRICAL STRATEGY

Botswana’s fiscal trajectory tells a story of managing resource wealth while striving for long-term stability. The empirical strategy aims to assess how Botswana has navigated fiscal sustainability amid resource dependency, focusing on the stability of fiscal policy over time. A three-pronged approach aims to address the volatility, governance challenges, and fiscal fragility common to resource-rich economies. First, by constructing a composite FSI, the analysis captures shifts in fiscal stability—making it possible to evaluate whether sustained revenue mobilisation, prudent expenditure management, and controlled debt have helped cushion volatility and promote long-term resilience. Second, structural break tests and Fiscal Reaction Function allow for the identification of turning points and shifts in fiscal behaviour, showing how the policy framework has evolved in response to both external shocks and institutional reforms. Finally, by linking fiscal sustainability scores with governance indicators over time, the analysis explores the feedback loop between institutional quality and fiscal performance.

4.1 Constructing the Fiscal Sustainability Index

To capture the complexities of fiscal sustainability in resource-rich economies, this thesis constructs a FSI that reflects Botswana’s evolving fiscal landscape, as outlined in Section 3.4. Similar composite index approaches have been used by [Mohanty and Mishra \(2016\)](#) and [Dholakia \(2005\)](#). Rather than relying on a single indicator, the FSI brings together five indicators; tax-to-GDP ratio, tax revenue volatility, expenditure-to-GDP ratio, fiscal balance, and debt service ratio. Specifically, they align with the criteria of fiscal sustainability (Criterion 1), macroeconomic stability (Criterion 2), precautionary savings (Criterion 3), and absorptive capacity (Criterion 5). Standardising these variables ensures comparability, but may also obscure the differential variance of each indicator—particularly if volatility measures exhibit outsized influence on the principal components.

PCA distills these indicators into a single measure, identifying shared patterns without imposing arbitrary weights (see [Abdi and Williams \(2010\)](#); [Greenacre et al. \(2022\)](#)). PCA was chosen over weighted scores or z-score averages to avoid subjective weight assignment and to allow the data structure to reveal dominant fiscal dynamics. While this enhances internal consistency, it also introduces interpretive limitations: the index captures co-movement rather than directional causality, and the relative importance of each component depends on the underlying variance structure rather than normative judgement.

The first principal component (PC1) alone explains over 43% of total variance (see

Table C2 in Appendix C), and aligns most closely with the conceptual dimensions of fiscal sustainability outlined in Section 3.4. PC1 was chosen over other variants due to the inclusion of additional components introducing greater short-term fluctuation and reduces interpretability (see Appendix C). The time series of FSI values is then analysed to reveal how pivotal reforms and external shocks have shaped Botswana’s fiscal trajectory. Higher FSI values indicate stronger fiscal stability, while lower values signal potential vulnerabilities.

All fiscal data are compiled from four annual reports published by the Bank of Botswana—specifically their statistical sections—each covering varying and overlapping periods: the 2025 edition covers 2013–2024¹⁰ (Bank of Botswana, 2025a), the 2015 edition covers 2005–2014 (Bank of Botswana, 2015), the 2006 edition covers 1996–2006 (Bank of Botswana, 2005), and the 2000 edition covers 1990–2001 (Bank of Botswana, 2000). Where appropriate, variables are expressed as shares of GDP to enable comparability over time and across dimensions.

Despite the credibility of the Bank of Botswana, several limitations merit consideration. As official sources, their reporting may reflect institutional or political biases, particularly in the presentation of fiscal performance. Methodological details—such as the classification of mineral revenues or the composition of debt aggregates—are not always publicly disclosed, limiting transparency and replicability. Historical data series are occasionally revised retroactively without accompanying documentation, complicating longitudinal analysis.

4.2 Structural Breaks and Fiscal Behaviour

To explore how Botswana’s fiscal policy has responded to shocks and structural changes, this thesis applies the Bai and Perron (2003) structural break analysis method to detect significant shifts in the fiscal sustainability trajectory. This approach is particularly relevant in resource-dependent contexts, where fiscal stability can be shaped by external shocks, political shifts, or economic crises. Detecting structural breaks provides a way to pinpoint *when* significant shifts in fiscal patterns occurred—such as a move from surplus to deficit regimes—and enables a more nuanced understanding of *why* those changes may have taken place. In doing so, the analysis offers insight into how Botswana’s fiscal stance has evolved in response to domestic and international pressures, including commodity price cycles, political shifts, and economic crises.

The Bai and Perron (2003) test is particularly appropriate for this setting because it allows for multiple endogenous breakpoints in a time series, meaning the test identifies structural changes based on the data itself rather than requiring pre-specified break dates

¹⁰only data up to 2022 is considered due to WGI availability

ex ante. The method tests for changes in a linear regression model¹¹, making it especially useful for evaluating fiscal indicators over time.

The Fiscal Reaction Function, following [Bohn \(1998\)](#), assesses whether Botswana’s fiscal policy responds systematically to debt accumulation. This is done by estimating whether the government adjusts its primary balance when public debt increases. The primary balance is regressed on the lagged debt-to-GDP ratio; a positive and statistically significant coefficient suggests that fiscal authorities tend to consolidate when debt rises, thereby stabilising the debt path.

Together, these two approaches provide complementary insights. The structural break analysis identifies when major shifts in fiscal policy occurred, while the Fiscal Reaction Function tests whether those shifts were accompanied by consistent policy responses. In this way, the Fiscal Reaction Function adds explanatory depth by showing how Botswana’s fiscal policy has adapted to pressures over time. With both the timing and responsiveness of fiscal shifts established, the next section turns to the institutional context in which these dynamics unfolded. Both methods rely on the same national fiscal dataset used to construct the FSI, covering the period 1990–2022.

4.3 Regression Analysis

To trace the evolution of institutional quality in Botswana, the thesis constructs a governance index using data from the Wordlbank WGIs spanning 1996–2022. Applying PCA, the index distills six governance dimensions into a single measure, with higher values indicating stronger institutional performance.

To explore the potential interaction between fiscal performance and institutional quality, the thesis tests whether higher levels of fiscal sustainability are associated with stronger governance outcomes. The analysis estimates a series of OLS regressions of the form:

$$\text{WGI}_t = \alpha + \beta \cdot \text{FSI}_{t-k} + \varepsilon_t \quad (1)$$

where the dependent variable is either the average of all six WGI indicators or specific sub-indices (e.g., Government Effectiveness, Control of Corruption), and the independent variable is the FSI, using both current and lagged values ($k = 0,1$)

The goal is to assess whether sustained fiscal performance coincides with or precedes improvements in governance. Robustness checks include broader FSI variants (PC1–3 and PC1–5), lagged models, leave-one-out index constructions, and the exclusion of major shock years identified by the structural break test, available in [Appendix A](#).

¹¹While the Bai–Perron test relies on linear regression techniques, its purpose is not to estimate causal relationships between variables. Rather, it applies least squares to segments of a time series in order to detect statistically significant changes in the level and/or slope of the series over time.

Governance quality is assessed using the WGI dataset, produced by the World Bank. The WGI provides annual scores across six institutional dimensions—government effectiveness, regulatory quality, rule of law, control of corruption, voice and accountability, and political stability—available for Botswana from 1996 to 2022.

The WGI indicators while widely used in institutional research, are based on perception-driven assessments drawn from expert surveys and risk-rating agencies. As such, they may reflect reputational inertia or external expectations, rather than direct administrative measures of institutional quality. Where definitional or reporting discrepancies arise, national data are prioritised to preserve analytical consistency.

4.4 Limitations and Considerations

While this empirical strategy provides a robust framework for tracking and analysing Botswana’s fiscal sustainability, it is not without limitations. The analysis relies on nationally sourced fiscal data that are available with full consistency from 1990 onward, ensuring a reliable basis for constructing the index and testing for structural breaks. As well as widely acknowledged WGI data from the World Bank, available from 1996 to 2022. Nonetheless, several methodological considerations remain.

First, the FSI is inherently descriptive and does not establish causality, limiting the extent to which specific fiscal policy changes can be directly linked to shifts in governance or economic outcomes. Structural break tests detect significant regime changes but do not elucidate the political economy dynamics underlying these transitions.

Second, the regression analysis linking fiscal sustainability to governance indicators is constrained by the limited time span of the WGI dataset (1996–2022) and the relatively small sample size. As a result, the findings should be interpreted as associations rather than causal effects.

Furthermore, key variables such as elite dynamics, electoral incentives, and donor influence remain outside the scope of this quantitative analysis. While robustness checks using lagged indicators, alternative specifications, and Newey-West corrections reinforce the consistency of the main results (see Appendix A, Tables A1-A3), the findings should be interpreted with caution given these limitations.

Finally, the quantitative methods applied here are designed to complement—not replace—qualitative assessments of institutional development and fiscal policy. The interpretation of results therefore draws on historical context and policy episodes to provide a more complete understanding of Botswana’s trajectory.

5 RESULTS AND DISCUSSION

The results are presented and discussed in two sections. First, descriptive statistics of Botswana’s fiscal indicators are outlined to set the stage for the subsequent analysis. Second, the research questions are addressed sequentially, beginning with an examination of the evolution of the FSI, incorporating a structural break analysis and a fiscal reaction function to assess shifts in fiscal behaviour. This is followed by an overview of governance performance trends. A regression analysis explores the relationship between fiscal sustainability and institutional quality. Finally, the findings will be summarised in light of the IMF criteria.

5.1 Descriptive Fiscal Statistics

The fiscal statistics presented here do more than trace Botswana’s macroeconomic trajectory, they are indicative of broader theoretical concerns in the literature on resource-dependent economies. The observed volatility and fiscal instability related to the resource curse ([Sachs and Warner, 2001](#); [Auty, 1993](#)), fiscal sustainability ([van der Ploeg, 2011](#); [Frankel, 2011](#)), and the persistent legacies of colonial fiscal structures ([Frankema and Booth, 2020](#)).

The oscillations in Botswana’s real GDP growth rates, shown in [Figure 1](#), particularly the sharp downturns in 2009 and 2020, show the susceptibility of resource-dependent economies to external shocks, as discussed by [Frankel \(2011\)](#) and [van der Ploeg \(2011\)](#). The 2009 contraction, spurred by the global financial crisis, exemplifies the procyclicality of Botswana’s fiscal policies ([Cuddington and Zellou, 2012](#); [Bova and Poghosyan, 2014](#)). Moreover, this cyclical volatility complicates [Sachs \(2003\)](#) argument that resource-rich states inevitably face structural stagnation. Instead, as [Hillbom \(2015\)](#) suggests in her examination of Botswana’s resource trap, the country’s growth trajectory may reflect a more complex interplay between resource dependency and external economic shocks.

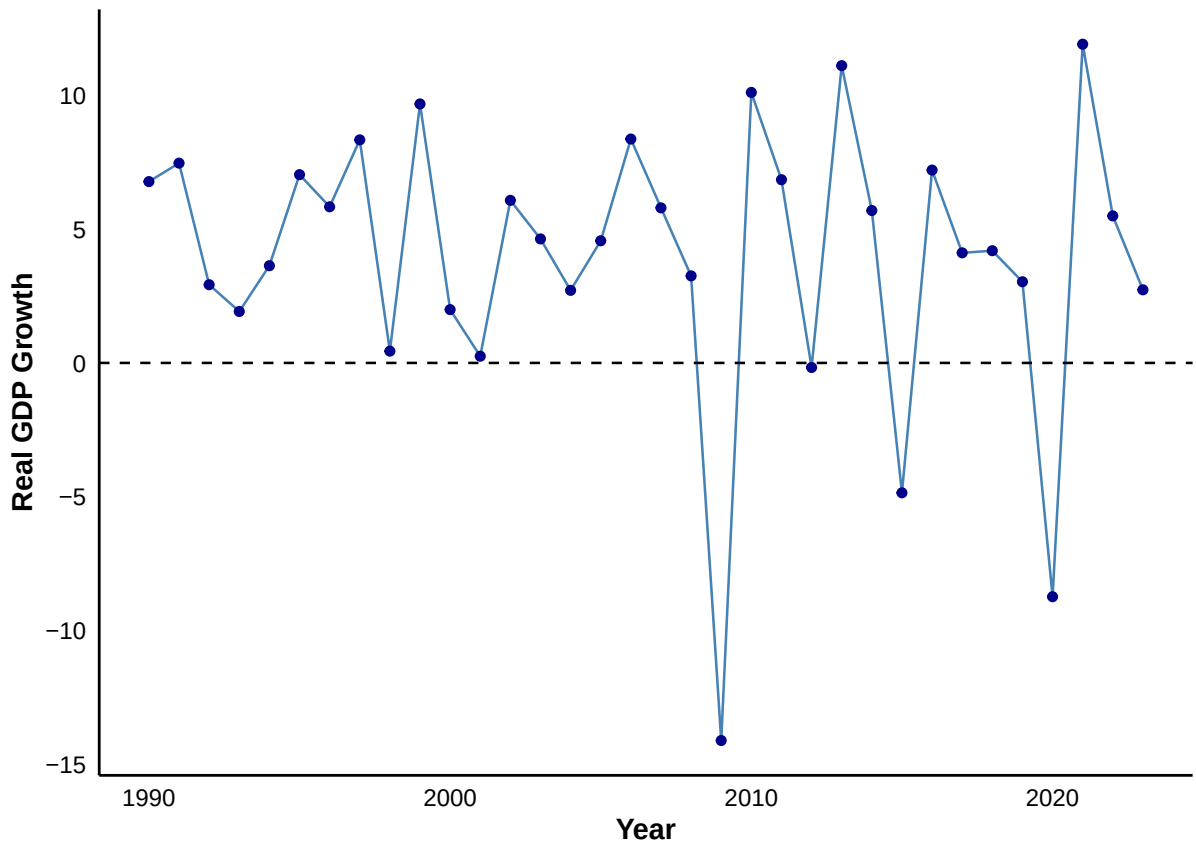


Figure 1: Real GDP Growth in Botswana (1990–2023)

Figure 2 shows the trajectory of tax revenue¹² as a percentage of GDP in Botswana between 1990 and 2022. The figure reveals a gradual but persistent decline in the country’s revenue-to-GDP ratio over the past three decades. The data reveals a pattern with significant year-to-year fluctuations, particularly in the late 1990s and early 2000s. While tax revenue consistently exceeded 30% of GDP during the 1990s and early 2000s, it shows a gradual downward trend over time. Peaks occurred around 1999 and 2016, but since then, the ratio has declined sharply, reaching its lowest point in 2021 at just above 22%.

The downward trend in the tax-to-GDP ratio shows the gradual weakening of fiscal capacity. While Leith (2005) and Hillbom (2008) point to the initial success of revenue centralisation and sound fiscal management, the continued decline in tax revenue exposes the challenge of maintaining a diverse tax base in an economy dominated by mineral wealth. Resource wealth can erode incentives to broaden revenue streams, heightening fiscal vulnerability over time (van der Ploeg, 2011). The shrinking tax ratio also reflects the limits of Botswana’s historical reliance on mineral rents (Ndlovu, 2016; Hillbom, 2015).

¹²This includes Customs & Excise, Mineral Revenue, Non-Mineral Revenue, and Other Taxes such as Taxes on property & VAT

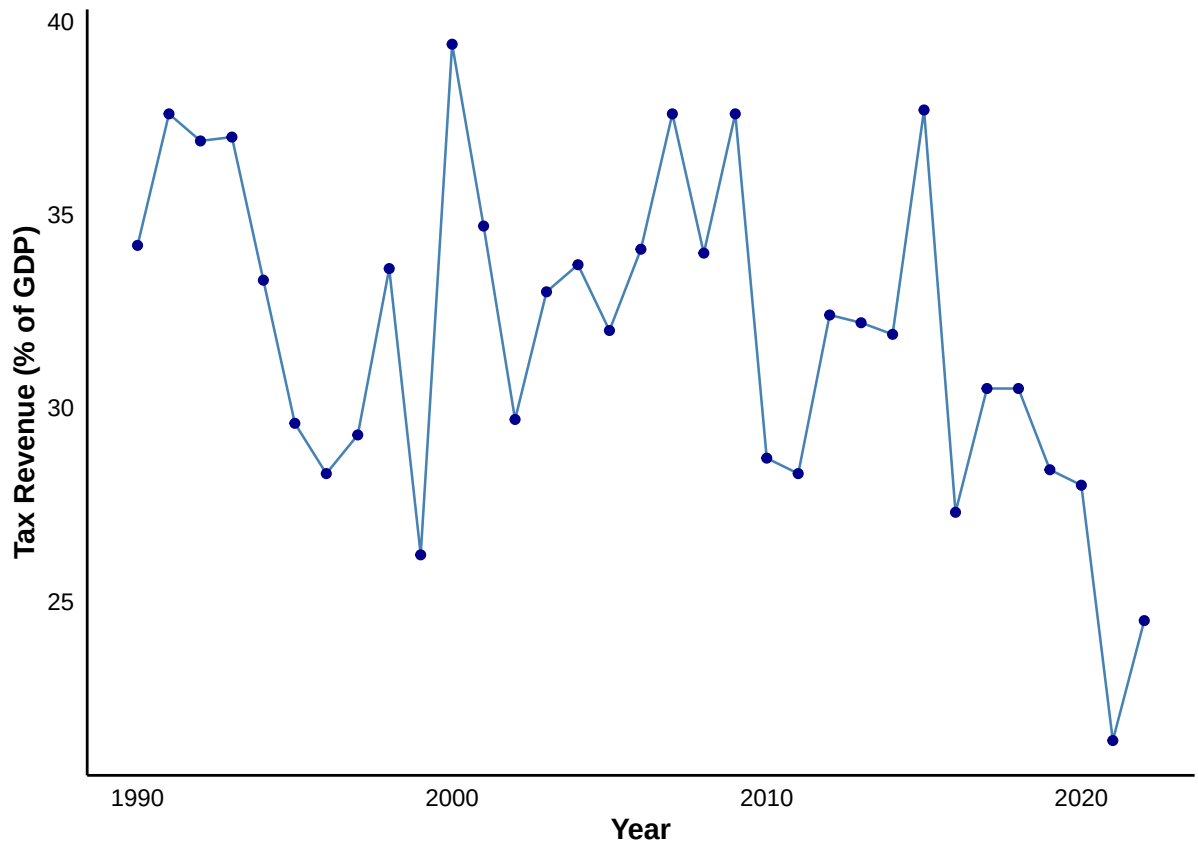


Figure 2: Tax Revenue % of GDP

The persistent volatility in expenditure as a share of GDP (see Figure 3) reflects the broader challenges of fiscal management in resource-dependent economies, where revenue fluctuations are largely driven by global commodity cycles (Frankel, 2011; van der Ploeg and Poelhekke, 2010). In Botswana, the pronounced spike in 2009, exceeding 47% of GDP, exemplifies the countercyclical fiscal stance adopted in response to the global financial crisis, a strategy consistent with the IMF’s advocacy for fiscal buffers to stabilise spending during economic shocks (IMF, 2010b, 2017). However, the subsequent decline in expenditure—culminating in a series-low of just under 30% by 2022—reflects the state’s attempt to restore fiscal discipline amid mounting pressures to consolidate public finances. This phase of expenditure restraint is particularly salient given the ongoing depletion of mineral reserves and the erosion of financial buffers, raising concerns about the sustainability of such a procyclical fiscal adjustment in the absence of significant revenue diversification (Bolt and Hillbom, 2018; Hillbom, 2015). This tension between short-term fiscal stabilisation and long-term revenue constraints shows a core dilemma in Botswana’s fiscal architecture (Mehlum et al., 2006; van der Ploeg, 2011)

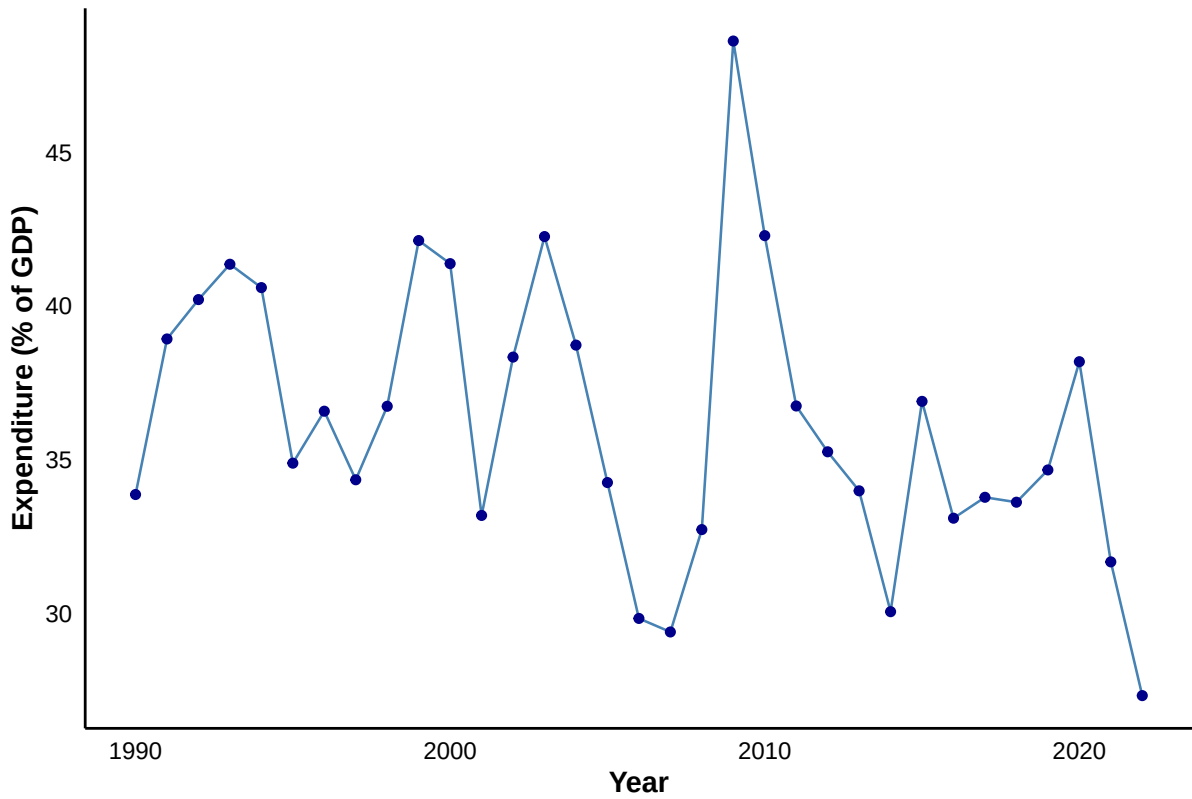


Figure 3: Expenditure % of GDP

Figure 4 presents Botswana's fiscal balance as a share of GDP from 1990 to 2022, illustrating the marked shift from sustained surpluses in the 1990s and early 2000s to more volatile outcomes in later years. While fiscal surpluses dominated the earlier part of the period, the balance began to fluctuate more markedly from the mid-2000s onward, aligning with the concept of a resource trap. The severe contractions around 2009 and 2020, coinciding with the global financial crisis and the COVID-19 pandemic, reveal Botswana's heightened exposure to external shocks, consistent with [Frankel \(2011\)](#) analysis of procyclical spending in commodity-exporting states. This transition from sustained surpluses to recurrent deficits shows the vulnerability of resource-dependent economies to global economic downturns ([van der Ploeg, 2011](#); [Bova and Poghosyan, 2014](#)).

Additionally, the widening deficits after 2009 align with [Bova and Poghosyan \(2014\)](#) argument that commodity price shocks can deepen fiscal imbalances, particularly in economies with concentrated revenue bases. In Botswana's case, the erosion of fiscal discipline that characterised earlier development efforts suggests a weakening of the fiscal rules and stabilisation mechanisms once emphasised by early leaders ([Hillbom, 2015](#); [Bolt and Hillbom, 2018](#)). As mineral revenues decline and progress in revenue diversification remains limited, the increased volatility in fiscal outcomes raises critical questions about the long-term sustainability of Botswana's fiscal framework ([IMF, 2012](#)).

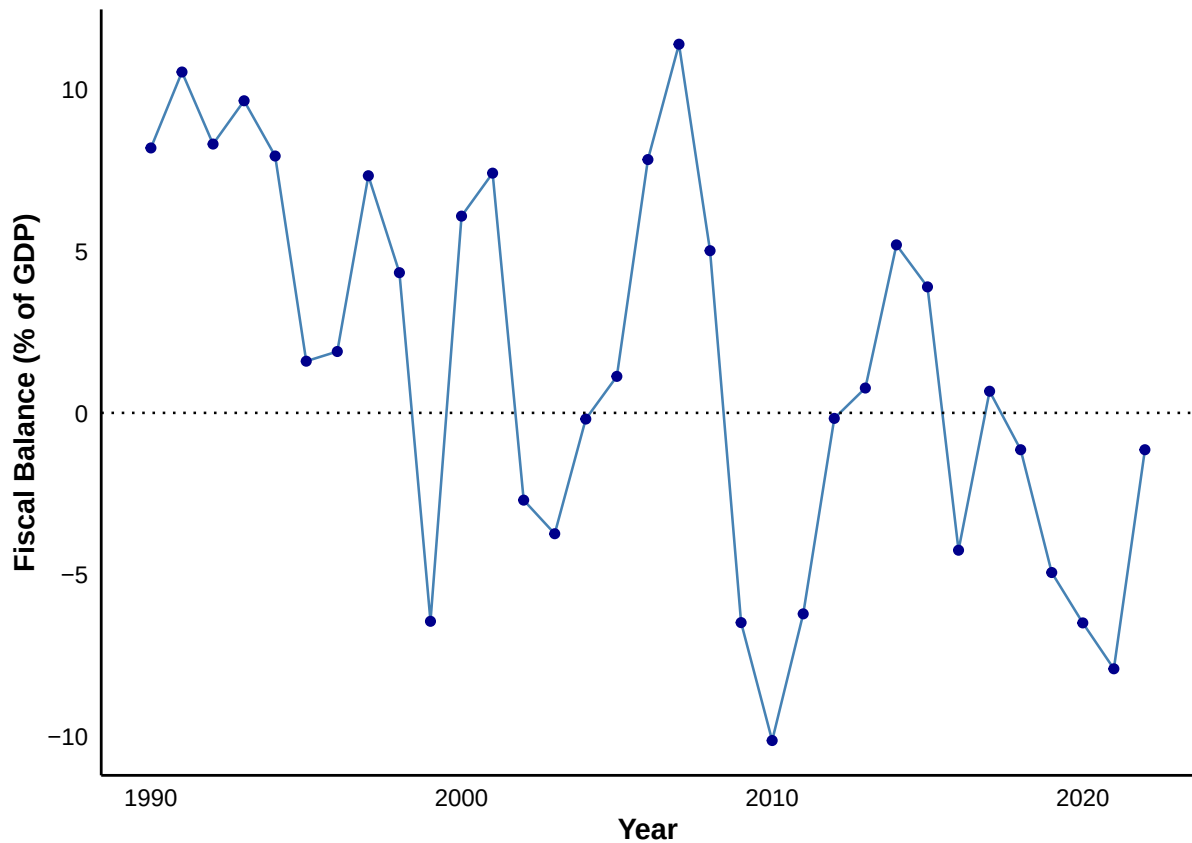


Figure 4: Fiscal Balance

The pronounced increase in Botswana's debt service ratio from 2009 (see Figure 5) onwards marks a pivotal shift in the country's fiscal dynamics. While the 1990s and early 2000s were characterised by relatively low debt servicing costs, with the ratio consistently below 1.5, the post-2009 period reveals a growing reliance on debt to finance fiscal deficits. This escalation mirrors broader patterns in resource-dependent economies, where declining commodity revenues and mounting expenditure pressures drive increased borrowing (Bova and Poghosyan, 2014).

The sharp rise from 2015 onwards indicates a deepening fiscal strain, as debt repayments consume a larger share of government revenues—a trend noted by Cevik and Teksoz (2014) in other resource-rich contexts facing protracted downturns. In Botswana's case, the expanding debt burden not only signals the erosion of fiscal buffers but also raises questions about the sustainability of current borrowing practices, particularly given the persistent volatility in mineral revenues and limited progress in economic diversification (IMF, 2017, 2012; Hillbom, 2015).

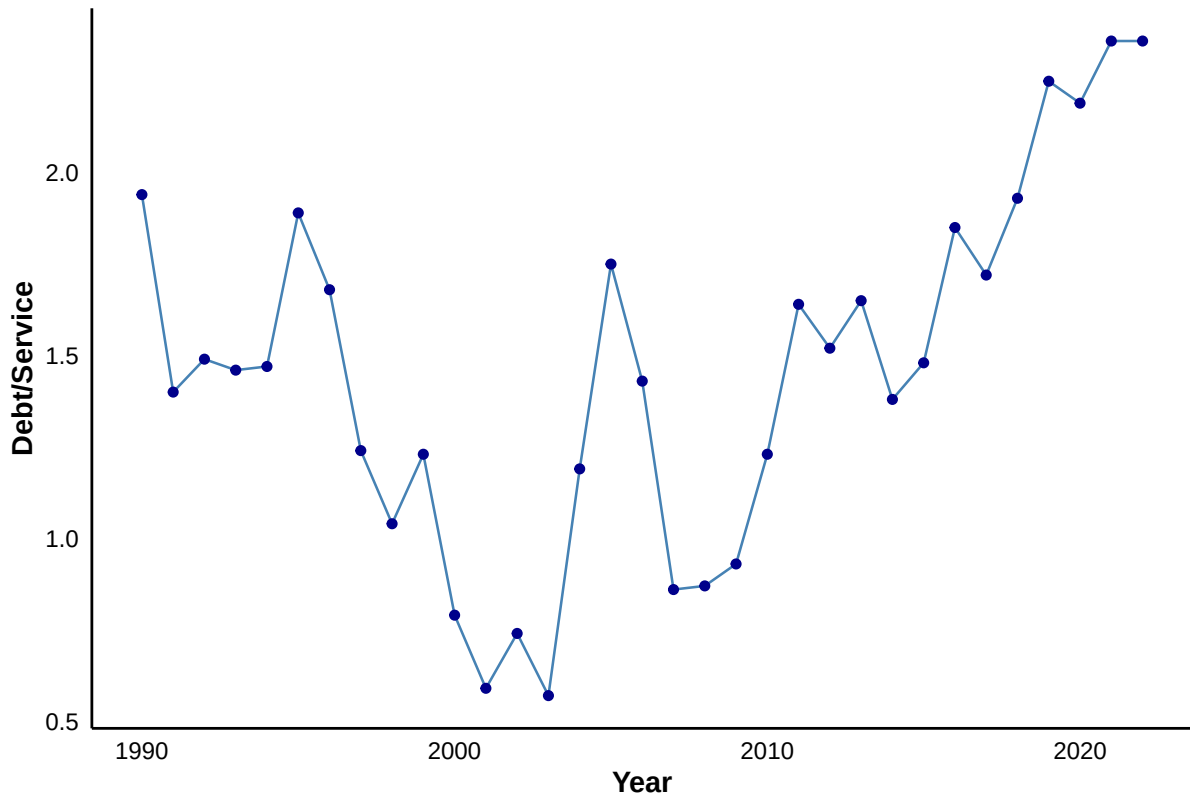


Figure 5: Debt/Service Ratio

Together, the figures reveal a fiscal trajectory marked by intensifying volatility, declining buffers, and rising debt dependency. The consistent decline in tax revenue (Figure 2), mounting expenditure pressures (Figure 3), and the growing debt service burden (Figure 5) all point to eroding fiscal sustainability, the first of the IMF’s evaluative criteria. These trends also reflect a weakening of absorption capacity, as institutional constraints have hindered Botswana’s ability to diversify revenue sources and adapt spending patterns. The earlier capacity for macroeconomic stabilisation, which is visible in the post-2008 countercyclical response, appears increasingly constrained, raising critical questions about the long-term viability of Botswana’s fiscal architecture. Comparative governance data offer further insight into Botswana’s evolving position. As shown in Appendix D, Table D1 and Figure D1, Botswana remains a clear outlier within Sub-Saharan Africa, outperforming both neighbouring and resource-rich peers across all six WGI dimensions. Particularly notable are its elevated scores on political stability and control of corruption—domains often eroded early in resource-dependent states. This lays the groundwork for the FSI and structural break analysis that follow, where these institutional dynamics are formalised.

5.2 Fiscal Volatility and the Role of Fiscal Capacity

Following independence, Botswana implemented a fiscal framework that was unusually precautionary for a resource-rich economy. Public savings mechanisms like the Pula Fund and fiscal rules such as the Sustainable Budget Index (SBI) were intended to manage mineral revenues prudently and insulate public finances from volatility (Hujo, 2012; Ministry of Finance, 2023; Kojo, 2010). Together, these institutions represented more than just a high-revenue regime—they embodied a form of fiscal capacity grounded in institutional restraint. According to Sebudubudu and Moooketsane (2016), the establishment of the Pula Fund was not merely a fiscal measure but also a strategic effort to institutionalise governance practices that insulated public finances from political pressures to spend resource revenues prematurely.

This approach aligns closely with the IMF’s emphasis on precautionary savings (Criterion 3) and resource fund integration (Criterion 6), where stabilisation funds are embedded within broader fiscal frameworks to sustain public expenditure during revenue downturns. Botswana’s early use of such mechanisms thus reflects a conscious attempt to operationalise fiscal rules in ways rarely seen among comparable resource-dependent states. As established in the section 2, Botswana’s early fiscal architecture was characterised by prudence and long-term planning. However, as outlined in section 3 this model of institutional discipline and fiscal restraint was not a given but rather the product of deliberate state-building efforts in a post-colonial context marked by weak administrative foundations (Hillbom, 2015; Frankema and Booth, 2020). The establishment of fiscal rules and savings funds represented deliberate efforts to build institutional resilience and differentiate Botswana from other resource-rich states in the region (Iimi, 2006; Leith, 2005). This institutional development illustrates the absorption capacity criterion (Criterion 5), which focuses on a state’s ability to manage resource revenues without undermining fiscal discipline. As Frankema and Booth (2020) suggest, Botswana’s departure from colonial extractive legacies involved constructing rule-based mechanisms capable of channelling volatile revenues into stable long-term planning.

Noted in section 5.1, the 1990s and early 2000s were marked by consistent surpluses, low debt, and moderate revenue volatility. This fiscal prudence helped Botswana weather early external shocks with relatively little disruption, contributing to its reputation as a model of macro-fiscal discipline among resource-rich developing countries. These features are further reflected in the early part of the FSI, shown in Figure 6. While the FSI does not capture long-term revenue projections directly, the index’s early high values, underpinned by fiscal surpluses, low debt, and stable revenues, are broadly consistent with the IMF’s fiscal sustainability criterion (Criterion 1). The early FSI values also provide quantitative support for Botswana’s position as an outlier in the resource curse literature (Sachs and Warner, 1995).

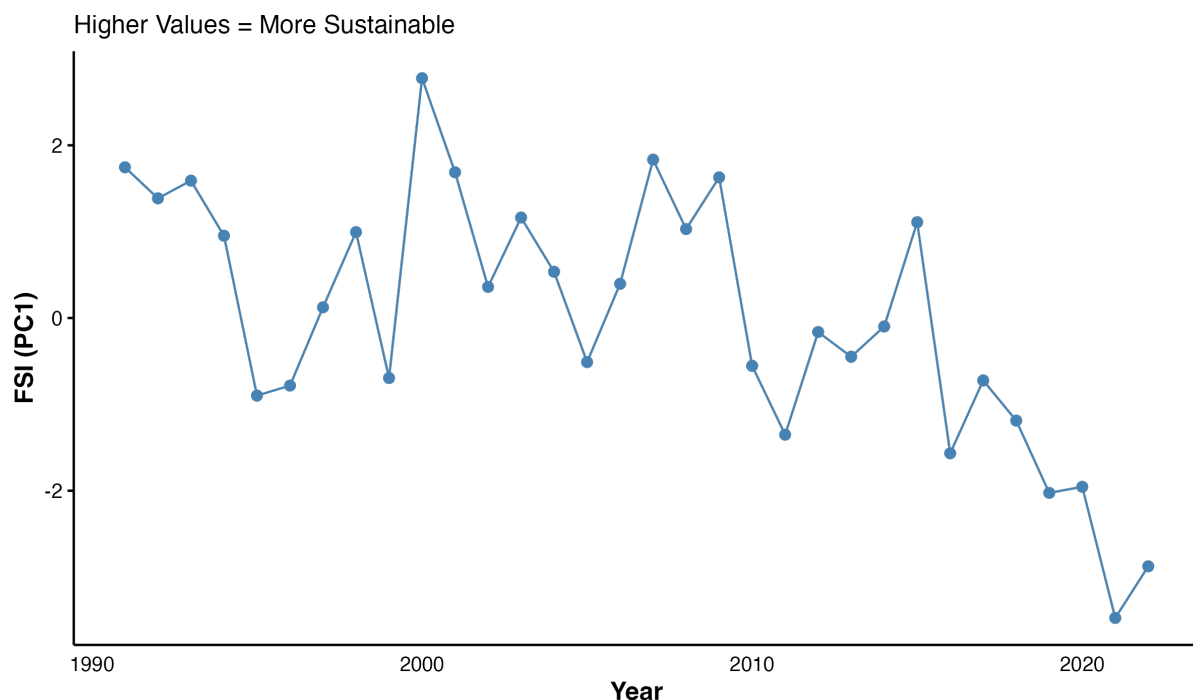


Figure 6: Fiscal Sustainability Index (PC1), 1990–2022

The index captures a period of strength during the 1990s and early 2000s, consistent with the observed prevalence of fiscal surpluses, low debt levels, and moderate revenue volatility. Nevertheless, the FSI shown in Figure 6 suggests a critical inflection point. From 2008 onwards, the index shows a marked decline, reflecting a shift from precautionary savings to more reactive expenditure management. As debt servicing costs rise and tax revenues decline, the foundations of Botswana’s fiscal capacity show signs of erosion. The [Ministry of Finance \(2023\)](#) report identifies a critical juncture in Botswana’s fiscal trajectory post-2008, marked by an increasing reliance on external debt as mineral revenues began to decline. This shift is evident in the positive loading on the debt service ratio (0.563), which indicates that the growing debt burden has exerted further downward pressure on fiscal sustainability. Without a concurrent broadening of the tax base, this reliance on debt has increased fiscal vulnerability ([Sebudubudu et al., 2014](#); [Ministry of Finance, 2023](#)).

The disaggregated loadings in Table 2 help explain this trend. Tax-to-GDP and fiscal balance have strong negative loadings, meaning their decline directly lowers the FSI. By contrast, debt service—positively loaded—has increased over time, exerting further downward pressure on sustainability.

Table 2: PCA Loadings for Fiscal Sustainability Index

Variable	PC1
Tax-to-GDP	-0.621
Tax Revenue Volatility	-0.079
Expenditure-to-GDP	-0.288
Fiscal Balance-to-GDP	-0.445
Debt Service Ratio	0.563

Note: Loadings are based on standardised variables. PC1 is used to construct the main Fiscal Sustainability Index, and is flipped so that higher values indicate stronger fiscal sustainability.

Botswana’s post-2008 trajectory shows how continued dependence on mineral rents, without sufficient diversification, has undermined the resilience of its fiscal institutions. Noted by [van der Ploeg \(2011\)](#), such transitions often mark deeper institutional vulnerabilities. While the frameworks established in the early post-independence period embodied a form of fiscal restraint, the observed decline in the FSI indicates that these mechanisms are under strain—raising broader questions about the durability of fiscal stability in the face of evolving pressures. By the early 2020s, the FSI reaches its lowest levels in the entire series, indicating a substantial erosion of fiscal resilience.

While Botswana’s overall debt levels remain moderate, the composition has shifted, with increased reliance on domestic and multilateral borrowing. Critically, this shift has occurred without a corresponding broadening of the non-mineral tax base, leaving the state more exposed to volatility and narrowing its fiscal space ([Kojo, 2010](#)). Botswana’s fiscal architecture, which was once characterised by precautionary savings, has increasingly become more debt-dependent. The erosion of fiscal capacity does not signal institutional collapse, but rather a recalibration of what fiscal resilience entails under conditions of sustained volatility and declining resource dependence. The earlier model—rooted in precaution and surpluses—has become harder to sustain amid rising development demands, electoral pressures, and tightening global financial conditions.

These findings are reinforced by the Fiscal Reaction Function analysis, which tests whether Botswana’s primary balance systematically responds to rising debt. Table 3 presents the results where the primary balance is regressed on lagged debt¹³, with additional models including GDP growth and lagged primary balance as controls. All models are estimated with Newey–West standard errors to correct for autocorrelation and heteroskedasticity.

¹³A one-year lag of public debt was chosen following Bohn (1998) and in line with standard practice in the fiscal reaction function literature (see e.g. IMF, 2011; Gosh et al., 2013). This specification balances model parsimony with the limited annual time series data available for Botswana. Including additional lags would reduce degrees of freedom and risk overfitting, particularly given the relatively small sample size.

Table 3: Fiscal Reaction Function: Effect of Lagged Debt on the Primary Balance (1990–2022)

	(1) Baseline	(2) + GDP Growth	(3) + Lagged PB	(4) Full Model
Intercept	3.953*** (1.257)	4.101*** (1.278)	2.541** (1.153)	2.213* (1.115)
Lagged Debt-to-GDP	-0.0068** (0.0024)	-0.0058** (0.0022)	-0.0029 (0.0021)	-0.0017 (0.0020)
GDP Growth		0.112 (0.087)		0.154* (0.077)
Lagged Primary Balance			0.472*** (0.134)	0.512*** (0.133)
R^2	0.200	0.267	0.384	0.472
Observations	33	32	32	31

Notes: Standard errors in parentheses. Dependent variable is the primary fiscal balance as a percentage of GDP. Lagged Debt-to-GDP refers to the public debt ratio from the previous year. GDP growth is the annual percentage change in nominal GDP. PB = Primary Balance. Newey–West standard errors (lag = 1) used in all models. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

The results show a negative and significant coefficient on debt in the simplest specifications, but this effect weakens once controls are added. In the full model (Model 4), the coefficient becomes statistically insignificant, suggesting that Botswana’s fiscal response to debt has weakened over time. Lagged primary balance is a strong predictor in all models, indicating the presence of fiscal inertia, while GDP growth only matters at the margin.

Botswana’s fiscal capacity did help mitigate volatility and support long-term stability—particularly in the first two decades post-independence. However, that capacity has weakened over time. The loss of fiscal capacity has been gradual but cumulative, shaped by both exogenous shocks and endogenous institutional drift. While the underlying institutions have not disappeared, their ability to enforce discipline and anchor planning has diminished, raising questions about how fiscal resilience can be restored in a new phase of development.

5.3 Structural Shifts in Fiscal Policy

Botswana’s fiscal landscape has not remained static; instead, it has undergone shifts that reflect broader economic and institutional dynamics. The evidence from the structural break analysis on the FSI reveals two critical inflection points in Botswana’s fiscal policy: 2009 and 2018. These years mark periods of pronounced economic disruption and domestic policy recalibration, showing the susceptibility of Botswana’s fiscal framework to external pressures and evolving governance structures.

The 2009 inflection point corresponds directly with the global financial crisis, a period

marked by collapsing commodity prices and severe contractions in global demand (Frankel, 2011). For diamond-dependent economies like Botswana, the shock was particularly acute, as diamond exports plummeted and fiscal buffers were rapidly depleted (IMF, 2010b). This event exposed the fragility of Botswana’s revenue base, heavily reliant on mineral rents, and prompted the government to increase borrowing to stabilise public finances, noted in Bova and Poghosyan (2014) as a common fiscal response in commodity-exporting states facing revenue collapses. The spike in debt service ratios observed post-2009 further reflects the procyclical spending pressures typical of resource-rich economies during periods of economic crisis (Cuddington and Zellou, 2012), signalling a retreat from the IMF criterion on precautionary savings (Criterion 3), which advocates accumulating buffers in boom periods to protect against future downturns.

The 2018 structural break signals a more complex set of dynamics. While less directly linked to a single global event, this inflection point coincides with growing fiscal strain due to persistently low commodity prices, exacerbated by declining diamond output and escalating debt repayments (Ministry of Finance, 2023; IMF, 2023). This phase aligns with van der Ploeg (2011) analysis of fiscal stress in resource-dependent states, where the initial fiscal surpluses dissipate under mounting expenditure pressures without adequate revenue diversification. The erosion of fiscal buffers by 2018 also mirrors the concerns raised by Sebudubudu and Moooketsane (2016), who caution against over-reliance on mineral rents without sustained investment in structural revenue reforms, and signals a further departure from the criterion on precautionary saving (Criterion 3), while simultaneously raises concerns about the state’s ability to maintain macroeconomic stability (Criterion 2) in the face of ongoing vulnerabilities.

The alignment of these structural breaks with significant global and domestic shifts suggests that Botswana’s fiscal regime is increasingly exposed to both cyclical shocks and deeper structural vulnerabilities. The persistence of these patterns raises critical questions about the robustness of Botswana’s institutional frameworks and the capacity of existing fiscal rules to effectively buffer the state against external volatility and rising debt burdens. This erosion of resilience is indicative of declining absorption capacity (Criterion 5), as defined by the IMF; where fiscal institutions fail to adapt effectively to manage spending, borrowing, and investment under new economic conditions.

Together, the structural break and Fiscal Reaction Function results, presented in 5.2, suggest a broader pattern: fiscal policy in Botswana has become less anchored in rule-based responsiveness and more path dependent. While earlier episodes of volatility were met with institutionalised adjustments, more recent shifts appear to be driven by political pressures and ad hoc responses. What emerges is not just a story of fiscal weakening, but one of institutional fatigue—where rules remain formally in place but lack sufficient political traction to steer policy. However, as the literature on colonial fiscal legacies sug-

gests, the constrained tax base inherited from the colonial era has left Botswana overly reliant on volatile mineral revenues (Frankema and Booth, 2020; Ndlovu, 2016). The post-2009 erosion of fiscal capacity can thus be interpreted as a consequence of structural dependence—a form of resource trap (Hillbom, 2015) where political pressures to maintain spending have outpaced institutional mechanisms for fiscal restraint (Frankel, 2011; van der Ploeg and Poelhekke, 2010).

5.4 Institutions and the Fiscal–Governance Nexus

Botswana’s fiscal and institutional trajectories reveal a compelling, yet increasingly fractured relationship. Initially characterised by mutual reinforcement, this connection has, over time, shifted towards one defined by stagnation and erosion. The findings suggest a transition from a once-cohesive nexus to one that is now fraying under the weight of fiscal pressures and governance inertia.

Figure 7 presents a composite governance index for Botswana from 1996 to 2022, constructed from the six dimensions of the WGI. The index reveals a clear pattern of governance decline over time, with a prominent decline from the early-2000. This decline simultaneously as the FSI started to erode, which could suggest a linkage between fiscal stress and governance erosion, further explored through regression analysis.

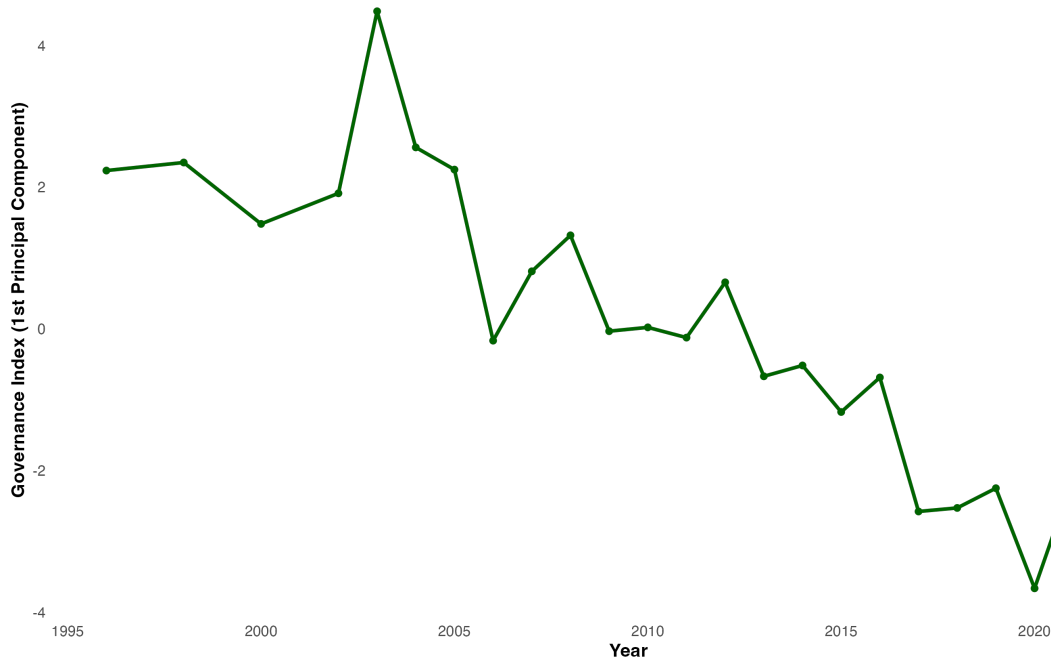


Figure 7: Botswana: PCA-Based Composite Governance Index (1996–2022)

This observed synchrony between fiscal and governance dynamics speaks to Acemoglu et al. (2001) on the co-evolution of institutions and fiscal capacity, particularly in resource-

dependent economies. The decline in governance scores during fiscal downturns illustrates how mineral wealth can simultaneously finance state-building and fuel rent-seeking, gradually eroding institutional integrity. This pattern further aligns with [Mehlum et al. \(2006\)](#), who argue that in the absence of strong institutions, fiscal volatility in resource-rich states can exacerbate governance erosion under fiscal pressure. The weakening of Botswana’s governance indicators during fiscal crises also reflects a diminished ability to uphold fiscal sustainability (Criterion 1), as institutional constraints undermine long-term expenditure discipline and increase vulnerability to debt and deficits.

The relationship is examined more formally through a series of regressions linking the FSI to WGI scores. Table 4 reports a statistically significant association between fiscal sustainability and average WGI scores. The core component of the FSI (PC1) is strongly associated with higher governance scores (Model (1)), with a coefficient of 0.029¹⁴ significant at the 1% level. Broader indices using PC1–3 and PC1–5 also yield significant results, albeit at slightly lower levels of confidence (Model (2) and (3)). Lagged specifications (Model (4) and (6)) confirm these patterns. However, the results should be interpreted with caution. Although lagged relationships strengthen the case for directional influence, the analysis does not establish causality. Given the limited time series, and the reputational nature of WGI indicators, these regressions are best viewed as evidence of co-movement over time, not proof of a unidirectional effect. The findings do, however, show a weakening synergy between fiscal discipline and institutional strength in Botswana’s recent trajectory. The strongest effects are found for the core and full index variants, whilst Model (5) is the only one without statistical significance.

¹⁴WGI are measured between -2.5 (weak governance) and +2.5 (strong governance). Given their bounded scale and slow-moving nature, even a coefficient of 0.029 reflects a meaningful association.

Table 4: Effect of Fiscal Sustainability on Average Institutional Quality (1996–2022)

	Dependent Variable: Average WGI Score					
	(1) PC1	(2) PC1–3	(3) PC1–5	(4) Lag(PC1)	(5) Lag(PC1–3)	(6) Lag(PC1–5)
Intercept	0.681*** (0.013)	0.679*** (0.015)	0.681*** (0.014)	0.677*** (0.014)	0.673*** (0.016)	0.674*** (0.014)
FSI – Core Component	0.029*** (0.009)					
FSI – Broader Index (PC1–3)		0.014* (0.008)				
FSI – Full Index (PC1–5)			0.016** (0.007)			
Lagged FSI – Core Component				0.030** (0.011)		
Lagged FSI – Broader Index					0.010 (0.008)	
Lagged FSI – Full Index						0.016** (0.006)
Observations	24	24	24	23	23	23
R^2	0.339	0.124	0.213	0.275	0.078	0.234
Adjusted R^2	0.309	0.084	0.177	0.240	0.034	0.197
AIC	-60.5	-53.8	-56.3	-55.7	-50.1	-54.4
BIC	-57.0	-50.2	-52.8	-52.3	-46.7	-51.0
Log-Likelihood	33.273	29.887	31.171	30.835	28.074	30.198
RMSE	0.06	0.07	0.07	0.06	0.07	0.07

Notes: Standard errors in parentheses. The dependent variable is the average of all six World Governance Indicators. PC1–3 and PC1–5 refer to Fiscal Sustainability Indices constructed using 3 and 5 principal components, respectively.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

This finding aligns with broader evidence from the fiscal capacity literature. For instance, [Besley and Persson \(2011\)](#) argue that states with greater fiscal capacity are more likely to exhibit stronger institutional quality, as both are driven by state-building efforts that reinforce each other over time. The observed erosion of both governance and fiscal stability in Botswana, particularly after 2008, echoes concerns that when fiscal buffers deplete and revenue bases remain undiversified, institutional quality is often the first casualty ([van der Ploeg, 2011](#); [Frankel, 2011](#)).

Among the six specifications presented in Table 4, Model (1) achieves the lowest AIC and BIC values. These information criteria suggest that it offers the best trade-off between model fit and simplicity. For this reason, Model (1) is treated as the primary specification in the interpretation that follows, though other variants (including lagged and broader index versions) yield consistent results in terms of direction and magnitude.

While the R^2 values in the core specifications are modest (0.34 for Model (1)), they align with expectations for governance data and still capture meaningful explanatory power given the use of a single fiscal predictor. In the context of political economy

regressions—where institutional outcomes are shaped by a broad range of historical and structural factors—this level of fit is analytically useful and consistent with findings in similar studies (see e.g. [Acemoglu et al. \(2001\)](#)).

While the decline in fiscal sustainability appears correlated with weaker governance, this link may not be solely fiscal in origin. Botswana’s post-2015 trajectory also reflects broader political shifts, including entrenched elite dominance, the weakening of oversight institutions, and diminishing electoral competitiveness under continued BDP rule (see e.g. [Hillbom \(2012\)](#); [Good \(1994\)](#); [Sebudubudu and Botlhomilwe \(2012\)](#); [Sebudubudu et al. \(2014\)](#)). As [Good \(1994\)](#) and [Sebudubudu and Moooketsane \(2016\)](#) argue, formal institutional frameworks may erode under conditions of long-standing political incumbency, even without outright crisis.

Table 5 to 6 show the effect of fiscal sustainability on Control of Corruption and Government Effectiveness¹⁵. The results show a consistent and positive relationship between the FSI and both outcomes, particularly for the core index (PC1). In Table 5, fiscal sustainability is significantly associated with stronger control of corruption across several specifications, including lagged models. Similarly, Table 6 shows that fiscal sustainability is positively correlated with government effectiveness, with lagged values of the core FSI remaining statistically significant at conventional levels. The effect on other governance indicators—such as regulatory quality and rule of law, found in Appendix B—is smaller but directionally consistent.

The observed positive and statistically significant association between the FSI and corruption control aligns with [Mehlum et al. \(2006\)](#), who emphasise that states with producer-friendly institutions are better positioned to prevent rent-seeking when fiscal resources are effectively managed. This interpretation is reinforced by the significant lagged coefficients in Table 4, suggesting that fiscal discipline may not only prevent immediate governance erosion but also have lingering protective effects as institutional frameworks adapt to economic pressures.

Robustness checks address potential concerns around measurement dependence, serial correlation, and sensitivity to outliers. These include: (i) models using lagged fiscal sustainability indices to test for delayed effects (Table 4, model (4)-(6)); (ii) fiscal sustainability on separate governance indicators (Table 5-6 & Table B1-B3 in Appendix B); (iii) leave-one-out variants of the FSI to assess the robustness of the index (Table A1 in Appendix A); (iv) standard errors corrected for autocorrelation using Newey–West adjustments and AR(1) specifications (Table A3 in Appendix A); (v) and exclusion of global shock years (2008 and 2020; see Table A2 in Appendix A)). Results are broadly

¹⁵According to Iimi (2006, pp. 9-10), the four most relevant government indicators when discussing escaping the resource curse are; voice and accountability, government effectiveness, control of corruption, and regulatory quality. See Appendix Table B1-B4 for regressions on remaining governance indicators

consistent in sign and magnitude across specifications. While some variants lose statistical significance, the overall pattern remains stable. This consistency suggests that the observed fiscal–institutional link is not an artefact of model specification or short-term volatility.

Table 5: Effect of Fiscal Sustainability on Control of Corruption (1996–2022)

	Dependent Variable: Control of Corruption (CC)					
	(1) PC1	(2) PC1–3	(3) PC1–5	(4) Lag(PC1)	(5) Lag(PC1–3)	(6) Lag(PC1–5)
Intercept	0.870*** (0.030)	0.868*** (0.033)	0.870*** (0.032)	0.873*** (0.031)	0.433*** (0.023)	0.433*** (0.021)
FSI – Core Component	0.052** (0.020)					
FSI – Broader Index (PC1–3)		0.028 (0.017)				
FSI – Full Index (PC1–5)			0.027* (0.015)			
Lagged FSI – Core Component				0.064** (0.023)		
Lagged FSI – Broader Index					0.014 (0.011)	
Lagged FSI – Full Index						0.020** (0.009)
Observations	24	24	24	23	23	23
R^2	0.237	0.114	0.133	0.272	0.074	0.176
Adjusted R^2	0.202	0.074	0.094	0.237	0.029	0.137
AIC	-20.6	-17.0	-17.6	-19.7	-33.4	-36.1
BIC	-17.1	-13.5	-14.0	-16.3	-30.0	-32.7
Log-Likelihood	13.310	11.522	11.786	12.836	19.692	21.042
RMSE	0.14	0.15	0.15	0.14	0.10	0.10

Notes: Standard errors in parentheses.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 6: Effect of Fiscal Sustainability on Government Effectiveness (1996–2022)

	Dependent Variable: Government Effectiveness (GE)					
	(1) PC1	(2) PC1–3	(3) PC1–5	(4) Lag(PC1)	(5) Lag(PC1–3)	(6) Lag(PC1–5)
Intercept	0.441*** (0.021)	0.438*** (0.023)	0.441*** (0.022)	0.438*** (0.020)	0.433*** (0.023)	0.433*** (0.021)
FSI – Core Component	0.031** (0.014)					
FSI – Broader Index (PC1–3)		0.012 (0.012)				
FSI – Full Index (PC1–5)			0.0216 (0.010)			
Lagged FSI – Core Component				0.046*** (0.015)		
Lagged FSI – Broader Index					0.014 (0.011)	
Lagged FSI – Full Index						0.020** (0.009)
Observations	24	24	24	23	23	23
R^2	0.182	0.046	0.097	0.314	0.074	0.176
Adjusted R^2	0.145	0.003	0.056	0.281	0.029	0.137
AIC	-37.7	-34.0	-35.3	-40.3	-33.4	-36.1
BIC	-34.2	-30.5	-31.8	-36.9	-30.0	-32.7
Log-Likelihood	21.853	20.007	20.668	23.142	19.692	21.042
RMSE	0.10	0.11	0.10	0.09	0.10	0.10

Notes: Standard errors in parentheses.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

To explore the possibility of a dual-interplay, an additional regression was run with WGI as the independent variable and FSI as the dependent variable. The results (see Table E1, in Appendix E) show a significant and positive relationship, particularly for lagged institutional quality, suggesting a feedback loop in which institutional strength both influences and is influenced by fiscal management. This reciprocal dynamic aligns with Besley and Persson (2011), who conceptualise fiscal capacity and governance quality as mutually reinforcing, with institutional robustness serving as a precondition for effective fiscal management.

Acemoglu et al. (2001) argue that governance and fiscal capacity are not static constructs but are dynamically intertwined, particularly in resource-dependent states where mineral rents can both finance state-building and foster rent-seeking. In Botswana, the transition from disciplined budgeting to rising debt and fiscal slippage may reflect a broader institutional shift from adaptive recalibration to fiscal inertia (Frankel, 2011), possibly due to the erosion of rule-based fiscal frameworks during periods of economic stress. However, this complementarity has weakened over time. While Botswana’s governance indicators remain high by regional standards, the government quality has stagnated or declined since the mid-2010s—seen in the downward trend of the governance PCA in Figure 7.

While the observed co-movement between fiscal instability and governance erosion aligns with established frameworks on the resource curse (Mehlum et al., 2006; van der Ploeg,

2011), these findings also reveal deeper structural vulnerabilities in Botswana’s institutional architecture. [Acemoglu et al. \(2001\)](#) present Botswana as a rare success story where inclusive institutions mitigated resource-related governance risks. However, the observed governance decline post-2009 raises critical questions about the extent to which Botswana’s institutions were genuinely inclusive or whether they were more fragile and contingent on mineral revenues than previously acknowledged. Similarly, [Mehlum et al. \(2006\)](#) suggest that institutional strength moderates the adverse effects of resource dependence, preventing governance erosion. Yet, the persistent decline in Botswana’s governance scores during fiscal downturns suggests that its institutional capacity may have been overstated, particularly in the context of rising debt and declining revenue streams.

The evidence indicates that fiscal sustainability and institutional quality in Botswana were once mutually reinforcing, but that this relationship has become increasingly fragile. The issue is not the disappearance of formal rules or governance structures, but a gradual erosion of policy responsiveness and institutional credibility. In resource-rich settings, where technocratic institutions often substitute for deep political accountability, this erosion carries particular risks. Long-term fiscal performance, the data suggest, cannot be decoupled from institutional resilience—and both must be actively maintained.

5.5 Summary of Findings

Viewed through the IMF’s fiscal framework, Botswana’s trajectory reflects a clear pattern of institutional shift: initial strong performance across nearly all six evaluative dimensions has steadily deteriorated¹⁶. The pre-2009 era was characterised by institutionalised restraint; fiscal surpluses regularly exceeding 5% of GDP (Figure 4), a positive and rather stable FSI (Figure 6), and the accumulation of sizeable buffers ([IMF, 2024](#)). These features reflect ‘High’ alignment with IMF criteria on fiscal sustainability, precautionary savings, and macroeconomic stability (Criteria 1–3), supported by relatively stable expenditure levels (Figure 3) and low debt servicing burdens, which remained below 1.5 for most of the 1990s and early 2000s (Figure 5).

However, from 2009 onward—and especially after 2018—performance increasingly fell into ‘Moderate’ or ‘Low’ territory across the board, due to fiscal sustainability declining sharply: sustained surpluses gave way to recurrent deficits, often exceeding –3% of GDP and reaching –7% by 2020 (Figure 4); the FSI fell from values above 2 to below –2 between 2008 and 2022, a decline of over four standardised index units (Figure 6); and the debt service ratio more than doubled, rising from under 1 in the early 2000s to above 2.1 by 2022 (Figure 5). Meanwhile, tax revenue declined from above 35% of GDP in the early

¹⁶Classifications (‘High’, ‘Moderate’, ‘Low’) reflect trends in the FSI, fiscal balance, debt servicing, and institutional behaviour. ‘High’ indicates rule-based discipline, strong buffers, and consistent surpluses or low debt burdens. ‘Moderate’ denotes emerging strain or partial erosion, while ‘Low’ reflects institutional weakening, fiscal stress, and diminished adherence to stabilising principles.

1990s to under 25% in 2022 (Figure 2), narrowing the fiscal base. Expenditure flexibility diminished as investment was constrained by rising debt (Figure 3), while absorptive capacity weakened amid signs of institutional stagnation. Resource fund integration, once a key anchor of credibility, became more discretionary, undermining the IMF's emphasis on rule-based insulation. This erosion of alignment with Criteria 4–6—covering expenditure flexibility, absorptive capacity, and resource fund integration—suggests that Botswana's earlier model of disciplined fiscal governance has entered a more fragile, path-dependent phase.

This trajectory does not reflect a cyclical downturn, but a more structural shift in the nature of Botswana's fiscal governance, from a savings-based, countercyclical model to one increasingly reliant on discretionary borrowing and reactive adjustment. Section 5.2 demonstrates that Botswana's fiscal capacity did play a stabilising role in the earlier period, helping to smooth expenditure and insulate the economy from external shocks. In contrast, the later period is marked by a declining FSI and growing dependence on debt finance.

These developments are mirrored in the structural break analysis (see section 5.3), which identifies 2009 and 2018 as critical inflection points. The results point to a gradual departure from rule-based responsiveness and a move toward more discretionary and politically constrained fiscal adjustment. This shift is further reinforced by the Fiscal Reaction Function analysis, which shows that the government's responsiveness to rising debt has weakened over time, indicating diminished institutional capacity to enforce corrective fiscal policy.

Finally, the regression results, presented in section 5.4 reveal a strong and consistent association between fiscal sustainability and institutional quality, both contemporaneously and with lagged effects. However, while the relationship remains statistically robust, both governance and fiscal performance have declined over time. Rather than a decoupling, the points to mutual institutional weakening—where earlier gains in both domains are being eroded, consistent with the dynamics of institutional fatigue and path dependency.

Table 7: Criteria Derived from IMF Fiscal Framework

IMF Criterion	Pre-2009	2009–2017	Post-2018
Fiscal Sustainability	High: Sustained surpluses, low debt, and strong buffers; FSI peaks	Moderate: FSI declines; buffers drawn down; revenue base weakens	Low: FSI at historic low; rising debt and shrinking revenue undermine solvency
Macroeconomic Stability	High: Fiscal rules followed; countercyclical management maintained	Moderate: Reactive adjustments post-2009; rules increasingly strained	Low: Stabilisation weakens; responses driven by short-term pressures
Precautionary Savings	High: Pula Fund accumulates; savings anchor fiscal stability	Moderate: Buffers depleted during crisis; limited replenishment	Low: Savings hollowed out; debt replaces buffers as primary shock absorber
Expenditure Flexibility	Moderate: Investment scaled cautiously; constrained by capacity	Moderate: Restraint maintained but limits growth-enhancing spending	Low: Fiscal space narrows; mounting debt restricts responsive investment
Absorptive Capacity	Moderate: Capacity gaps persist despite reforms; delivery challenges visible	Moderate: Institutional strain emerges; governance stagnates	Low: Institutional rigidity deepens; weak implementation constrains effectiveness
Resource Fund Integration	High: Pula Fund embedded in fiscal rules; supports discipline	Moderate: Use becomes more discretionary; insulation weakens	Low: Rule-based discipline increasingly symbolic; political discretion expands

The IMF framework helps clarify what is at stake. The six criteria foreground not only

macroeconomic outcomes, but the institutional mechanisms underpinning fiscal performance. The gradual downgrading across all dimensions suggests that Botswana’s earlier success depended on more than technocratic rule design—it required sustained political commitment to restraint, long-term planning, and institutional discipline. As these commitments have weakened, so too has the coherence of the fiscal model.

While Botswana continues to outperform many resource-rich peers on core governance indicators (see Appendix D), this relative strength must be interpreted with caution. Outlier status in 2022 reflects the legacy of earlier institutional discipline, not the persistence of it. The analysis in Sections 5.2-5.4 shows that fiscal responsiveness, savings buffers, and governance quality have all weakened. In this light, Botswana exemplifies a resource trap (Hillbom, 2015). Botswana is not seeing an outright collapse into mismanagement, but a gradual erosion of resilience, where past success delays—but does not eliminate—emerging constraints.

6 CONCLUSION

Botswana arguably occupies a nuanced middle ground in the debate over whether success should be attributed to institutions or geography. Its remarkable growth would have been unthinkable without the discovery and exploitation of mineral wealth, and particularly diamonds. Yet resource abundance alone does not explain the country’s relative success. It is the strength of Botswana’s institutional architecture, especially its commitment to fiscal discipline and political stability, that has translated resource rents into development rather than volatility. As Mehlum et al. (2006) argue, resource wealth becomes a curse in the absence of producer-friendly institutions, and Botswana’s case reinforces this point. While Botswana’s fiscal framework has long been praised as a model of rule-based resource governance, the country’s continued reliance on diamond exports, limited economic diversification, and persistent inequality suggest it has not fully escaped the risks of resource dependence. Botswana appears to be drifting toward a more constrained position—one that fits Hillbom (2015) diagnosis of a resource trap, rather than representing an unqualified success.

The question, then, is whether Botswana’s fiscal institutions enabled it to escape the resource curse. The empiric evidence suggests a partial escape. Botswana has avoided the classic symptoms of the curse—macroeconomic instability, rampant corruption, and fiscal procyclicality—but not its more gradual traps. The FSI reveals that Botswana combined institutionalised prudence with adaptive fiscal responses, generating a degree of macro, fiscal stability that is rare among resource-rich countries. However, in recent years, rising debt levels, declining fiscal responsiveness, and a weakening institutional, fiscal nexus suggest growing divergence from international standards. While Botswana once aligned

closely with the IMF’s fiscal framework, particularly in sustainability, precautionary savings, and fund governance, this alignment has frayed. In this way, Botswana’s experience therefore reflects the difficulty of sustaining alignment with sound fiscal principles in the face of structural dependence and institutional fatigue. Rules persist, but their enforcement has weakened. The erosion is not total, but cumulative: formal rules remain in place, yet their capacity to enforce discipline and guide adjustment has diminished.

This pattern fits what might be called a late-stage resource curse: not driven by mismanagement at the point of windfall, but by the long-run challenge of adaptation once those windfalls plateau. Botswana’s case shows that technocratic rules are not self-sustaining; their credibility rests on continued political commitment. Without it, even well-designed institutions may falter under the weight of inertia, expectations, and exogenous shocks. Botswana’s experience complicates the usual story of the resource curse. While its economic success owes much to diamond wealth, this thesis has shown that fiscal capacity, rooted in long-term planning, rule-based budgeting, and institutional restraint, has played a central role in converting volatile rents into relative stability. Yet, this resilience has not been linear or guaranteed.

The findings of this thesis invite a rethinking of how resilience is conceptualised in development theory. Often framed as a latent property of strong states or institutional robustness, resilience is better understood—following [North \(1990\)](#) and [Rodrik \(2008\)](#)—as a process shaped by historical contingency, political incentives, and collective choice. Botswana’s experience suggests that resilience does not reside in institutional form alone but in the capacity for policy to adapt, absorb, and recalibrate under strain. Rather than a condition to be attained, resilience emerges through strategic restraint, fiscal discipline, and institutional memory—qualities that are cultivated, not guaranteed.

As [Ostrom \(2005\)](#) argues, the durability of institutional arrangements depends less on their design than on the incentives and norms that sustain them over time. In resource-rich economies, where volatility is structural and shocks are recurrent, resilience should not be equated with equilibrium or the absence of failure. It is a form of dynamic stability, that is negotiated, contested, and sometimes erodes. To that end, development models must move beyond static metrics of good governance and account for the iterative, political nature of resilience itself.

Theoretically, these conclusions align with the newer literature on the resource curse: resource wealth is not inherently destabilising, but its effects depend on the structure and resilience of institutions. Empirically, this thesis offers a replicable and scaleable method for tracking fiscal sustainability in resource-rich economies by constructing a composite index. In doing so, it bridges macroeconomic indicators and institutional performance, by linking fiscal outcomes with underlying governance dynamics.

Nonetheless, several avenues for future research remain. First, the descriptive nature of the FSI allows for an expansion of the index to a panel of resource-rich countries that would enable quasi-experimental approaches—such as synthetic control or matching techniques—to estimate the effects of fiscal rules and institutional reforms on long-term stability. Second, integrating political economy variables into structural break tests could help clarify when and why fiscal rules hold or falter—whether reform trajectories are shaped more by internal coalitions, external shocks, or institutional design. Finally, a disaggregated sectoral analysis, particularly on public investment funded by mineral revenues, could deepen understanding of how fiscal capacity translates into development outcomes. Such extensions would not only contextualise Botswana’s experience within broader patterns of fiscal governance, but also test the generalisability of its lessons.

Beyond Botswana, the findings offer lessons for other resource-rich African economies grappling with the dual challenge of managing commodity volatility and building long-term fiscal resilience. Botswana’s trajectory raises a broader question: how long can exceptionalism persist in the face of structural dependence and institutional drift? The country’s early path was shaped by prudent leadership and favourable conditions, but as buffers shrink and pressures mount, the future will depend not on past restraint, but on renewed capacity to adapt. Whether that adaptation can occur within the existing framework, or demands deeper institutional transformation, remains an open question.

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Appendix A: Robustness Checks

Appendix A provides robustness checks for the relationship between fiscal sustainability and institutional quality. These supplementary regressions assess whether the main findings are sensitive to alternative specifications, sample exclusions, and autocorrelation adjustments. Newey–West standard errors are employed to account for serial correlation and heteroskedasticity in the time series. AR(1) tests were conducted to assess autocorrelation in the residuals.

The robustness checks confirm that the positive association between fiscal sustainability and institutional quality holds under alternative model specifications, sample exclusions, and autocorrelation corrections. The FSI’s explanatory power remains consistent, particularly when fiscal balance and expenditure are retained in its construction.

Table A1: Robustness: Leave-One-Out FSI Components and Institutional Quality (1996–2022)

FSI Variant	(1) Full Index	(2) No Tax	(3) No Expenditure	(4) No Fiscal Balance	(5) No Debt Service
Intercept	0.681*** (0.013)	0.673*** (0.015)	0.673*** (0.013)	0.673*** (0.013)	0.673*** (0.015)
FSI Component	0.029** (0.009)	−0.024+ (0.012)	0.028** (0.009)	0.030** (0.009)	0.020 (0.012)
Observations	24	24	24	24	24
R^2	0.339	0.154	0.302	0.328	0.114
Adjusted R^2	0.309	0.116	0.270	0.297	0.074
AIC	−60.5	−54.6	−59.2	−60.1	−53.5
BIC	−57.0	−51.1	−55.7	−56.6	−50.0
Log-Likelihood	33.273	30.306	32.606	33.058	29.748
F	10.362	4.011	9.506	10.717	2.828
RMSE	0.06	0.07	0.06	0.06	0.07

Notes: Each column omits one component from the construction of the Fiscal Sustainability Index (FSI). The dependent variable is the average of all six WGI indicators.

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A2: Robustness Check: Exclusion of Global Shock Years

	No 2009	No 2015	No 2020	No 2009/2015/2020
Intercept	0.013 (0.014)	0.013 (0.014)	0.012 (0.014)	0.014 (0.014)
FSI – Core Component	0.003 (0.010)	0.003 (0.010)	0.003 (0.010)	0.004 (0.010)
Observations	4608	4609	4607	4184
R^2	0.000	0.000	0.000	0.000
Adjusted R^2	−0.000	−0.000	−0.000	−0.000
AIC	12317.6	12315.7	12306.3	11186.0
BIC	12336.9	12335.0	12325.6	11205.0
Log-Likelihood	−6155.8	−6154.9	−6150.2	−5590.0
F	0.091	0.083	0.071	0.115
RMSE	0.92	0.92	0.92	0.92

Notes: This table reports regression results excluding major global shock years. The dependent variable is the average WGI score. FSI is measured using PC1. Standard errors in parentheses. ⁺ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A3: Robustness Check: Autocorrelation-Corrected Models

	Newey-West SE	AR(1) Model
<i>Intercept</i>	0.681*** (0.014)	0.777** (0.271)
<i>FSI (PC1)</i>	0.029*** (0.007)	−0.455 (0.191)
<i>Lagged WGI</i>	—	1.000*** (0.382)
N	24	21
R^2	—	1.00

Notes: Robust standard errors in parentheses. Newey-West used HAC; AR(1) used `dynlm`.

Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Appendix B: Disaggregated Governance Regressions

Appendix B presents additional regressions testing the association between fiscal sustainability and disaggregated governance indicators. Each table uses a different WGI as the dependent variable and compares results across alternative index constructions and lagged specifications.

The additional regressions indicate that the association between fiscal sustainability and governance outcomes varies across different institutional dimensions. While the relationship is more consistent for indicators such as Rule of Law and Regulatory Quality, it appears weaker for Political Stability. These results provide further context for interpreting the scope and limitations of the main findings.

Table B1: Effect of Fiscal Sustainability on Rule of Law (1996–2022)

	Dependent Variable: Rule of Law (RL)					
	(1) PC1	(2) PC1–3	(3) PC1–5	(4) Lag(PC1)	(5) Lag(PC1–3)	(6) Lag(PC1–5)
Intercept	0.531*** (0.015)	0.529*** (0.017)	0.532*** (0.017)	0.527*** (0.017)	0.524*** (0.018)	0.524*** (0.016)
FSI – Core Component	0.034*** (0.010)					
FSI – Broader Index (PC1–3)		0.016* (0.009)				
FSI – Full Index (PC1–5)			0.019** (0.008)			
Lagged FSI – Core Component				0.033** (0.013)		
Lagged FSI – Broader Index					0.013 (0.009)	
Lagged FSI – Full Index						0.020** (0.007)
Observations	24	24	24	23	23	23
R^2	0.353	0.130	0.229	0.244	0.090	0.265
Adjusted R^2	0.324	0.090	0.193	0.208	0.047	0.230
AIC	-54.0	-46.9	-49.8	-47.5	-43.2	-48.1
BIC	-50.5	-43.4	-46.3	-44.1	-39.8	-44.7
Log-Likelihood	30.013	26.452	27.900	26.746	24.613	27.063
RMSE	0.07	0.08	0.08	0.08	0.08	0.07

Notes: Standard errors in parentheses. PC1–3 and PC1–5 refer to Fiscal Sustainability Indices constructed using 3 and 5 principal components, respectively. Rule of Law is drawn from the World Governance Indicators (WGI).

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table B2: Effect of Fiscal Sustainability on Voice and Accountability (1996–2022)

	Dependent Variable: Voice and Accountability					
	(1) PC1	(2) PC1–3	(3) PC1–5	(4) Lag(PC1)	(5) Lag(PC1–3)	(6) Lag(PC1–5)
Intercept	0.546*** (0.025)	0.545*** (0.026)	0.549*** (0.025)	0.529*** (0.022)	0.527*** (0.023)	0.529*** (0.021)
FSI – Core Component	0.031* (0.016)					
FSI – Broader Index (PC1–3)		0.019 (0.013)				
FSI – Full Index (PC1–5)			0.023* (0.011)			
Lagged FSI – Core Component				0.025 (0.017)		
Lagged FSI – Broader Index					0.011 (0.011)	
Lagged FSI – Full Index						0.022** (0.009)
Observations	24	24	24	23	23	23
R^2	0.139	0.085	0.159	0.096	0.045	0.216
Adjusted R^2	0.100	0.044	0.121	0.053	-0.001	0.178
AIC	-29.7	-28.2	-30.2	-34.2	-32.9	-37.5
BIC	-26.1	-24.7	-26.7	-30.8	-29.5	-34.1
Log-Likelihood	17.835	17.107	18.122	20.101	19.465	21.737
RMSE	0.12	0.12	0.11	0.10	0.10	0.09

Notes: Standard errors in parentheses. VA = voice and accountability (WGI). PC1–3 and PC1–5 refer to Fiscal Sustainability Indices constructed using 3 and 5 principal components, respectively.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table B3: Effect of Fiscal Sustainability on Political Stability (1996–2022)

	Dependent Variable: Political Stability					
	(1) PC1	(2) PC1–3	(3) PC1–5	(4) Lag(PC1)	(5) Lag(PC1–3)	(6) Lag(PC1–5)
Intercept	1.021*** (0.013)	1.022*** (0.013)	1.021*** (0.013)	1.018*** (0.012)	1.020*** (0.013)	1.021*** (0.013)
FSI – Core Component	-0.005 (0.008)					
FSI – Broader Index (PC1–3)		-0.001 (0.007)				
FSI – Full Index (PC1–5)			-0.003 (0.006)			
Lagged FSI – Core Component				-0.022** (0.009)		
Lagged FSI – Broader Index					-0.010 (0.006)	
Lagged FSI – Full Index						-0.009 (0.006)
Observations	24	24	24	23	23	23
R^2	0.015	0.001	0.012	0.218	0.102	0.115
Adjusted R^2	-0.030	-0.045	-0.033	0.181	0.060	0.073
AIC	-61.5	-61.2	-61.4	-63.0	-59.9	-60.2
BIC	-58.0	-57.6	-57.9	-59.6	-56.5	-56.8
Log-Likelihood	33.749	33.577	33.710	34.517	32.931	33.095
RMSE	0.06	0.06	0.06	0.05	0.06	0.06

Notes: Standard errors in parentheses. PS = Political Stability (WGI). PC1–3 and PC1–5 refer to Fiscal Sustainability Indices constructed using 3 and 5 principal components, respectively.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table B4: Effect of Fiscal Sustainability on Regulatory Quality (1996–2022)

	Dependent Variable: Regulatory Quality					
	(1) PC1	(2) PC1–3	(3) PC1–5	(4) Lag(PC1)	(5) Lag(PC1–3)	(6) Lag(PC1–5)
Intercept	0.674*** (0.020)	0.670*** (0.022)	0.673*** (0.022)	0.674*** (0.021)	0.670*** (0.023)	0.671*** (0.022)
FSI – Core Component	0.031** (0.013)					
FSI – Broader Index (PC1–3)		0.008 (0.011)				
FSI – Full Index (PC1–5)			0.014 (0.010)			
Lagged FSI – Core Component				0.032* (0.016)		
Lagged FSI – Broader Index					0.009 (0.011)	
Lagged FSI – Full Index						0.017* (0.010)
Observations	24	24	24	23	23	23
R^2	0.204	0.021	0.086	0.159	0.028	0.135
Adjusted R^2	0.168	-0.024	0.044	0.119	-0.018	0.094
AIC	-40.3	-35.3	-37.0	-36.1	-32.8	-35.5
BIC	-36.8	-31.8	-33.4	-32.7	-29.4	-32.1
Log-Likelihood	23.145	20.651	21.477	21.063	19.405	20.744
RMSE	0.09	0.10	0.10	0.10	0.10	0.10

Notes: Standard errors in parentheses. RQ = regulatory quality (WGI). PC1–3 and PC1–5 refer to Fiscal Sustainability Indices constructed using 3 and 5 principal components, respectively.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Appendix C: PCA Variations

Appendix C documents the construction and variation of the FSI using PCA. It includes the component loadings, explained variance, and two alternative index versions based on the first three and five components, respectively.

PC1 is selected as the main measure of fiscal sustainability because it captures the largest proportion of shared variance across fiscal indicators (43.5%). The alternative indices (PC1–3 and PC1–5) have similar results, but incorporate additional variation, but may dilute the fiscal core by including less relevant dimensions or noise.

Table C1: PCA Loadings for Fiscal Sustainability Index

Variable	PC1	PC2	PC3	PC4	PC5
Tax-to-GDP	-0.621	-0.127	-0.086	0.338	0.683
Tax Revenue Volatility	-0.079	0.566	0.763	0.303	-0.022
Expenditure-to-GDP	-0.288	0.568	-0.587	0.314	-0.388
Fiscal Balance-to-GDP	-0.445	-0.547	0.236	0.265	-0.613
Debt Service Ratio	0.563	-0.205	-0.102	0.791	0.077

Note: Loadings are based on standardised variables. PC1 is used to construct the main Fiscal Sustainability Index, and is flipped so that higher values indicate stronger fiscal sustainability.

Table C2: Explained Variance by Principal Components

Component	Standard Deviation	Variance (%)	Cumulative (%)
PC1	1.47	43.47	43.47
PC2	1.22	29.56	73.03
PC3	0.91	16.45	89.48
PC4	0.62	7.68	97.17
PC5	0.38	2.83	100.00

Note: PC1 explains the largest proportion of variance and forms the basis of the main index. The first three components together account for 89.5% of the total variance.

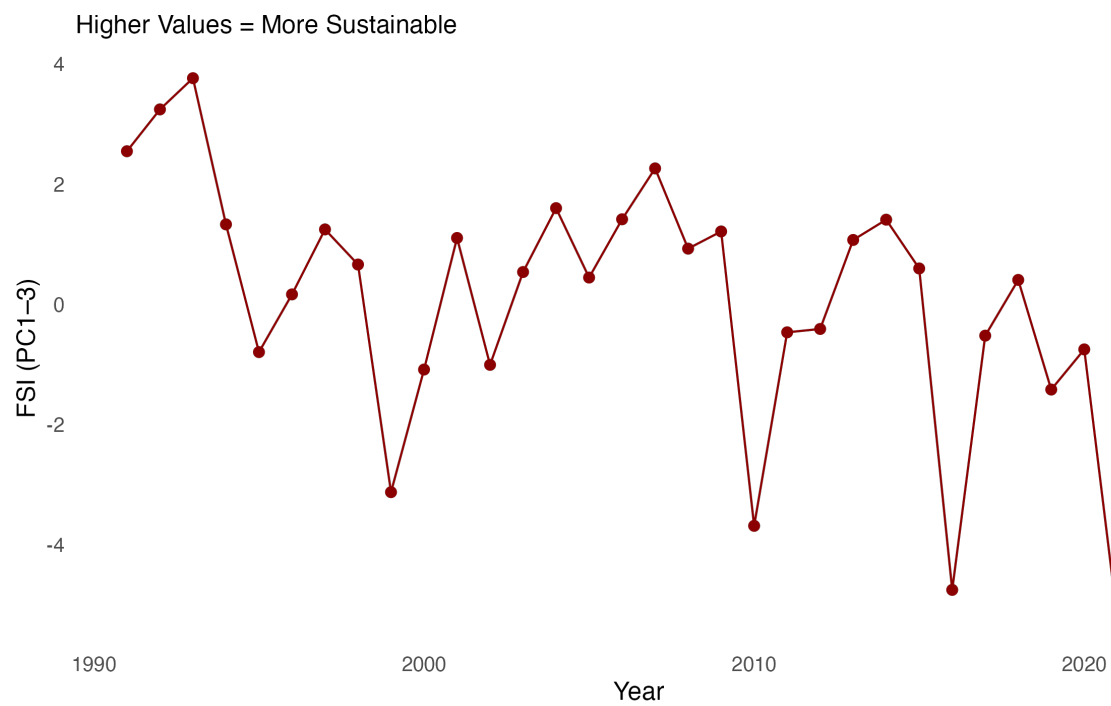


Figure C1: Fiscal Sustainability Index (PCI1-3), 1990-2022

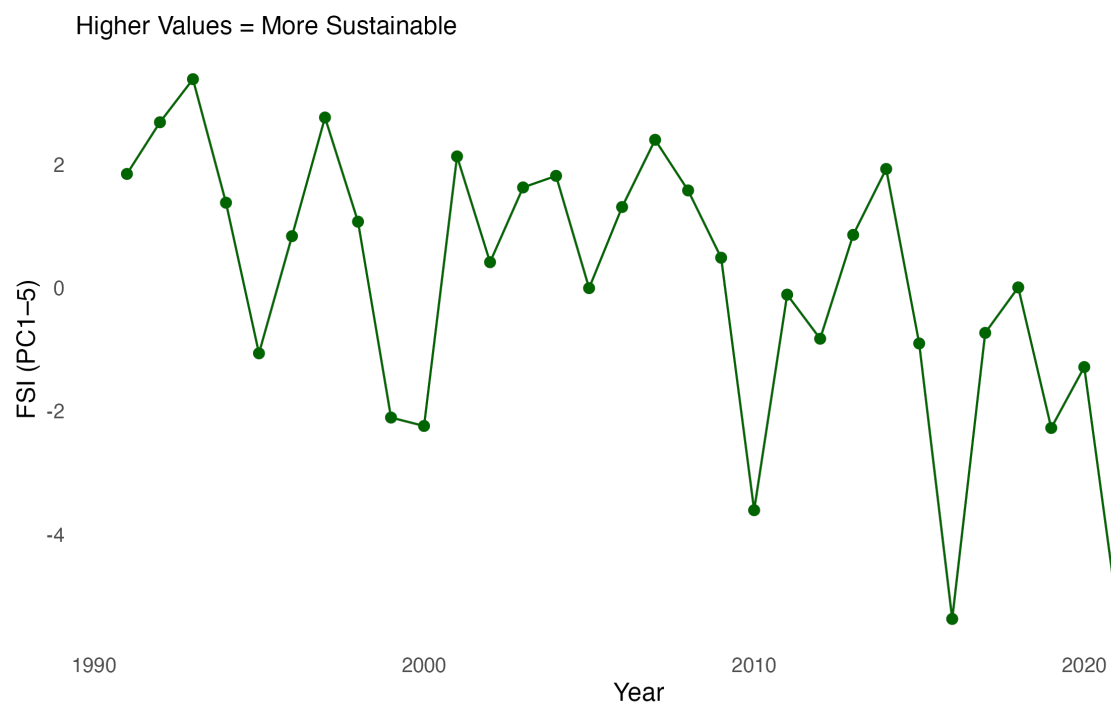


Figure C2: Fiscal Sustainability Index (PCI1-5), 1990-2022

Appendix D: Benchmarking Botswana

Appendix D provides descriptive comparisons of Botswana’s governance indicators relative to regional peers and resource-rich Sub-Saharan African countries. Table D1 presents a snapshot of six WGIs in 2021, while Figure D1 explores the broader relationship between natural resource rents and average institutional quality across countries—where Botswana clearly outperforms, especially compared to resource rich neighbours.

Table D1: Governance Indicators Snapshot (WGI), 2021

	Voice and Account- ability	Political Stability	Gov. Ef- fectiveness	Regulatory Quality	Rule of Law	Control of Corrup- tion
Botswana	0.46	1.04	0.32	0.60	0.45	0.67
Neighbouring Countries						
Lesotho	-0.01	-0.21	0.95	-0.76	-0.43	-0.35
Namibia	0.78	-0.75	-0.07	-0.09	0.06	-0.03
South Africa*	-1.29	-0.35	-0.75	-0.60	-0.58	-0.70
Eswatini	-1.28	-0.35	-0.75	-0.61	-0.58	-0.70
Resource-Rich SSA						
Nigeria	-0.64	-1.79	-1.03	-0.94	-0.87	-1.10
Angola	-0.86	-0.71	-1.13	-0.67	-0.98	-0.65
Eq. Guinea	-1.72	-0.20	-1.18	-1.73	-1.20	-1.59
Gabon	-0.89	-0.08	-0.82	-0.82	-0.71	-0.87
Sudan	-1.45	-1.99	-1.66	-1.48	-1.22	-1.28
Tanzania	-0.71	-0.34	-0.65	-0.64	-0.55	-0.39
Zambia	-0.37	0.05	-0.84	-0.57	-0.61	-0.76
Rep. of Congo	-1.24	-0.23	-1.32	-1.23	-1.10	-1.39
Averages						
SSA avg.	-0.57	-0.68	-0.84	-0.78	-0.74	-0.65
Low-income	-0.98	1.33	-1.27	-1.17	-1.14	-1.02
Lower- middle	-0.51	-0.41	-0.60	-0.67	-0.58	-0.59
Upper- middle	-0.11	-0.09	-0.20	0.24	-0.26	-0.32
High- income	0.74	0.72	0.94	0.98	0.95	0.96

Notes: Worldwide Governance Indicators (WGI), 2021. Scores range from approximately -2.5 (weak) to $+2.5$ (strong) governance performance. Classification of income based on World Bank's definition. Top 10 resource-rich Sub-Saharan African countries selected based on World Bank (Izvorski et al., 2018). *South Africa is both a neighbouring country and among the top 10 resource-rich countries.

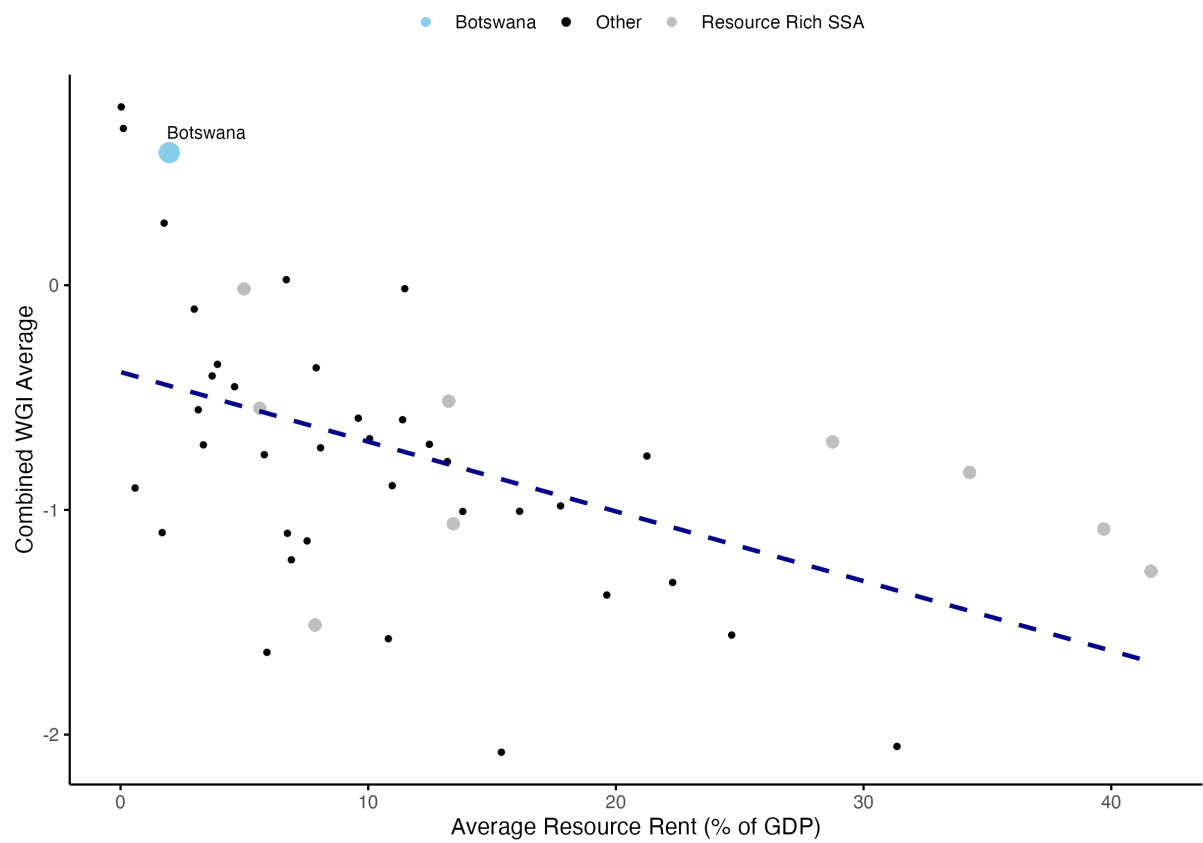


Figure D1: Resource Rent and Combined WGI Indicators (1996–2021)

Appendix E: Governance–Fiscal Feedback Loop

Appendix E explores the reverse relationship by examining whether institutional quality predicts fiscal sustainability. Table E1 presents regressions using average WGI scores and their lagged values to assess potential feedback effects from governance to fiscal performance.

The results indicate that stronger governance is positively associated with higher fiscal sustainability. The relationship becomes more pronounced and statistically significant when lagged values of governance are included, suggesting a possible delayed or reinforcing effect over time.

Table E1: Effect of Governance on Fiscal Sustainability (FSI), 1996–2022

Dependent Variable: Fiscal Sustainability Index (FSI)	(1) PC1	(2) PC1–3	(3) PC1–5	(4) Lag(PC1)	(5) Lag(PC1–3)	(6) Lag(PC1–5)
Intercept	-8.108*** (2.352)	-6.526* (3.497)	-9.329** (3.657)	-8.765*** (2.092)	-10.898*** (3.391)	-13.437*** (3.480)
WGI Average	11.675*** (3.472)	9.114 (5.162)	13.171** (5.397)			
Lagged WGI Average				12.447*** (3.076)	15.558*** (4.986)	19.347*** (5.117)
Observations	24	24	24	23	23	23
Adjusted R^2	0.309	0.084	0.177	0.411	0.284	0.377
AIC	83.3	102.4	104.5	73.9	96.1	97.3
BIC	86.9	105.9	108.0	77.3	99.5	100.7
Log Likelihood	-38.67	-48.19	-49.26	-33.94	-45.05	-45.65
RMSE	1.21	1.80	1.88	1.06	1.72	1.76

Notes: Standard errors in parentheses. PC1–3 and PC1–5 refer to Fiscal Sustainability Indices

constructed using 3 and 5 principal components, respectively.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Appendix F: AI Statement

This thesis benefited from the use of AI, primarily OpenAI's ChatGPT, to support coding in R. AI assistance was also used for minor language refinement, such as finding suitable synonyms and correcting grammar. All text, ideas, and arguments presented are entirely my own.