Mozambique and The Mozal Aluminum Project

Perils of Megaproject-Led Economic Development

Master of Arts in Law and Diplomacy Thesis

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Abstract

Macroeconomic trends and micro-level econometric impact evaluation analysis of Mozambique's industrialization strategy reveal the potential perils of "megaproject"-led growth. Beginning in the early 1990s, Mozambique adopted a wide range of economic policy reforms advocated by the multilateral donor community under the umbrella of the Washington Consensus and with a particular emphasis on large industrial projects. The $1.4 billion Mozal aluminum smelter kickstarted this approach in 2000, when the country's GDP was $1.7 billion. Mozambique subsequently attracted large amounts of foreign investment in the form of megaprojects, which served to offset a long history of external imbalances. While these projects improved Mozambique's balance of payments, the progression towards heavy foreign investment in extractive industries has created a vicious circle of deteriorating governance, declining foreign aid, and further reliance on extractive industries. The development implications of this shift are growing income inequality and chronically high unemployment for the bulk of Mozambique's citizens.

The strongest evidence of the perils of Mozambique's megaproject-led growth to achieve development goals can be found at the microeconomic level. The International Finance Corporation was one of the main sponsors of the Mozal plant on the premise that it would aid Mozambique's economic development both in terms of job creation and backward linkages to other industries but also through sponsorship of a trust focused on educational and health programming in the vicinity of the plant. Survey data conducted by Demographic and Health Surveys of 1,968 individuals in 1997 and 2,774 individuals in 2003 allow for a difference-in-differences econometric analysis of the impact of industrialization on a range of development indicators around Mozal compared to neighboring Gaza province. This analysis shows development indicators related to educational attainment declined in relative terms, as did access to running water and the share of female employment. Improvements came mainly in the form of purchased assets such as phones and refrigerators. The impact on health indicators is mixed, although it

appears knowledge of AIDS declined relatively in the industrialized areas. Possible explanations for these findings are both a rise in slum living conditions and migration of less educated individuals in search of work but also higher incomes.

Chapter 1: Macro Implications of Megaproject-Led Growth

"This is a success story, with important lessons for other countries that are trying to attract foreign investment." – Harvard Business School Professor Louis Wells, Jr., regarding the Mozal Aluminum Smelter Project, 2000 [1]

"The growth and export base are concentrated in a handful of commodity-based mega-projects that have few backward and forward linkages with the rest of the economy. These projects are also capital intensive, resulting in few jobs." – Fitch Ratings 2009 Sovereign Rating of Mozambique [2]

1.1 Historical Macroeconomic Imbalances and Weak Institutional Framework

Many of the factors underpinning Mozambique's current economic climate have their roots in the independence era. Prior to independence from Portugal in 1975, investment in Mozambique had been primarily focused on plantation agriculture. Most profits were remitted to Lisbon and British agricultural interests. Other important sources of foreign exchange were remittances from Mozambican workers in South Africa, as well as port fees for serving as a transshipment point for

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[1] Louis T. Wells, Jr., *Cutting Red Tape: Lessons from a Case-Based Approach to Improving the Investment Climate in Mozambique*, Occasional Paper, Administrative Barriers to Foreign Investment: Reducing Red Tape in Africa (Washington, DC: International Finance Corporation, 2000), 109.

[2] Purvi Harlalka, "Mozambique: Full Rating Report" (Fitch Ratings, August 27, 2010), 3.

goods flowing into and out of Zimbabwe and South Africa.[3] Thus from the country's very origins as an important *entrepôt* for Southern Africa, national income flowed from externally-generated demand and transfers. Beginning in the colonial era, the authorities in Mozambique ran persistent fiscal deficits, which had to be funded by transfers from Lisbon and external borrowing.[4]

The Liberation Front of Mozambique (FRELIMO), the Marxist-influenced guerrilla rebel group leading the opposition to the colonial regime, came to power after independence when it evolved into the country's dominant political party. However, unlike other independence movements in Africa that ultimately held a monopoly of political control for decades to come, such as the FLN in Algeria, FRELIMO never exacted a decisive victory over its colonial overlords. Rather, a military coup in Portugal led to a swift decision by the new government to abandon its colonial possessions, leading to a sudden and haphazard transition of power to FRELIMO. As a result, FRELIMO lacked the same degree of legitimacy and governing experience as other erstwhile guerrilla groups in Africa that overthrew their colonial powers, thus sowing the seeds for rivals' claim to power. Following independence from Portugal, Mozambique had to rebuild from physical destruction during the war and the flight of some 90 percent of the Portuguese settlers, including a cadre of competent bureaucrats who had run the colonial administration

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[3] David Plank, "Aid, Debt, and the End of Sovereignty: Mozambique and Its Donors," *The Journal of Modern African Studies* 31, no. 3 (1993): 425.
[4] Luiz A. Pereira, "The Transition and the Political Economy of African Socialist Countries at War (Angola and Mozambique)," in *African Economies in Transition*, ed. Jo Ann Paulson, vol. 2 (Centre for the Study of African Economies, 1999), 14.

at the exclusion of native Mozambicans. Many settlers destroyed what they could not bring back to Portugal.[5]

Economic policies pursued in the post-independence era were, as two well-known South American economists characterized them, "a blend of Latin American macroeconomic populism with African socialism."[6] State-led expansionary fiscal and monetary policies promoted income redistribution as the government nationalized the farms and industries that had been abandoned by the settlers. Price controls for basic inputs as well goods and services were put into place. As a result, fiscal and external deficits developed as well as widespread parallel markets. Institutions were particularly weak given the hasty transfer of power and the pre-independence exclusion of Mozambicans from the colonial bureaucracies.

Civil war broke out in 1977 as FRELIMO battled for legitimacy with the Mozambican National Resistance (RENAMO), originally sponsored by the Rhodesian intelligence services and later supported by Pretoria. Mozambique in turn lost a third of its foreign exchange receipts from Rhodesia from the decline in migrant workers, while Maputo's port activity shrank to one eighth of its pre-independence level as ships rerouted to ports in South Africa.[7] Imbalances worsened over the course of the war, as the government pursued policies of social redistribution and high military expenditure, coupled with declining tax collection. Disruption to agricultural production and destruction of infrastructure as the war waged on in the

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[5] Joseph Hanlon, *Mozambique: Who Calls the Shots?* (Bloomington, IN: Indiana University Press, 1991), 10.
[6] Luiz A. Pereira, "The Transition and the Political Economy of African Socialist Countries at War (Angola and Mozambique)," 9.
[7] Ibid., 17-18.

countryside led to the collapse of key commodity exports such as sugar, sisal, wood, and cashew nuts. World Bank data indicate real GDP declined 4.5% per year from 1980-1986.[8]

1.2 Foreign Aid Provides Important Offset

Mozambique endured, however, by establishing itself as a significant recipient of foreign aid in the post-colonial era, helping counteract the rest of the country's economic decline. This distinction was less a reflection of donor confidence in FRELIMO's stewardship of Mozambique than geopolitical factors. At the height of the Cold War, Mozambique's strong Marxist orientation ensured a steady flow of aid from the Soviet Union and its client states, estimated at $150 million per year, or 10% of GDP.[9] Some 700 Bulgarian cooperatives operated in Mozambique while nearly all of the country's shrimp were exported to the Soviet Union.[10] Mozambique, which also supported majority rule in South Africa, also collected aid from governments opposed to the apartheid regime. Successfully playing both sides off each other, Mozambique received aid inflows from widely divergent sources in the Soviet Union, the Non-Aligned Movement and the West, including Cuba, the Eastern Bloc, Sweden, and the Netherlands.[11]

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[8] "World Development Indicators (WDI)", World Bank Group, http://databank.worldbank.org.
[9] David Plank, "Aid, Debt, and the End of Sovereignty: Mozambique and Its Donors," 410.
[10] Tim Born, "Mozambique Background", December 5, 2010.
[11] Patrick Chabal, *A History of Postcolonial Lusophone Africa* (Bloomington, IN: Indiana University Press, 2002), 205.

Like the oil revenues flowing into the other ex-Portuguese colony of Angola, aid in Mozambique came with a particular downside: the creation of rents and rent-seeking behavior. Particularly during the civil war and at the height of the Cold War, much of the country's development aid ended up in the hands of the military forces under FRELIMO. At the same time, the country's weak institutional framework -- mere shells left behind by the colonists -- were tools of the regime, lacking any leverage to challenge the increasingly corrupt patronage network operating under FRELIMO. This continued even as the war wound down when, for example, the government and the international aid community established in 1988 the *Caixa de Credito Agrario e de Desenvolvimento Rural* (Agricultural and Rural Development Fund) to provide "loans" to military officers and party officials opposed to ending the war and the socialist planning model.[12]

Multilateral funding, starting with the first structural adjustment loan from the IMF in 1987, would help turn the tide of Mozambique's real GDP decline. FRELIMO recognized by the late 1980s that the stagnating economic situation was a threat to its hold on power so it launched an Economic Rehabilitation Program (ERP) under the aegis of the World Bank and IMF, and in turn received structural adjustment loans of $390 million from 1985-1990.[13] With these inflows, real GDP increased 3% annually from 1986-1992 despite the ongoing civil conflict.[14]

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[12] Joseph Hanlon, "Do Donors Promote Corruption?: The Case of Mozambique," *Third World Quarterly* 25, no. 4 (2004): 750.
[13] Luis Landau, *Rebuilding the Mozambique Economy: Assessment of a Development Partnership* (Washington, DC: The World Bank, 1998), 5.
[14] "World Development Indicators (WDI)."

Mozambique was arguably the most aid dependent country in Africa by the end of its civil war. This aid dwarfed nearly every other country in Africa, such that net official flows in 1990 were $946 million -- a staggering 71.7% of GDP -- compared to the sub-Saharan African average of 9.6% of GDP. With exports of $126 million (10% of GDP) and imports of $878 million (67% of GDP), foreign aid flows were thus funding the shortfall in foreign exchange earnings equivalent to 57% of GDP.[15] Foreign debt obligations, in turn, grew significantly in the 1980s, from $2.9 billion in 1982 to $4.7 billion in 1989.[16]

1.3 Poster Child of the Washington Consensus

Faced with a unipolar world after the collapse of the USSR and unable to continue playing one bloc off against another, Mozambique had no choice but to adopt the orthodox structural reform policies of the IMF if it hoped to continue to receive assistance. Mozambique's transition came at the time policy prescriptions of western governments and multilateral institutions coalesced around ten tenets that would be come to known as the Washington Consensus. This menu of reforms consisted of fiscal discipline; re-ordering public expenditure priorities; tax reform; liberalization of interest rates, trade, and inward FDI; a competitive exchange rate; privatization and deregulation; and development of property rights.[17]

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[15] David Plank, "Aid, Debt, and the End of Sovereignty: Mozambique and Its Donors," 408-411.
[16] Ibid., 410.
[17] John Williamson, "A Short History of the Washington Consensus," in *The Washington Consensus Reconsidered: Towards a New Global Governance*, ed. Narcis Serra (Oxford: Oxford University Press, 2008), 16-17.

Mozambique instituted policies under guidance of the IMF that devalued the *metical*, lifted trade barriers, and eliminated government subsidies. Between 1992 and 1999 Mozambique privatized over 1,000 state-owned enterprises.[18] In addition to privatizing the banking system, Mozambique allowed the free circulation of foreign currencies, notably the South African *rand*. The World Bank's chief economist later heralded Mozambique as a success story for having "implement[ed] key measures in financial liberalization, exchange rate reform, trade liberalization, and privatization through a series of adjustment operations."[19] Praise for Mozambique from the multilaterals has continued to this day, with the most recent Article IV Report from the IMF in 2009 praising Mozambique for having met benchmarks in terms of GDP growth, reserve holdings, and inflation, as well as "making steady progress in implementing structural reforms."[20]

1.4 Megaproject-Led Development

In a particular twist on the Washington Consensus menu of reforms, Mozambique pursued a development strategy heavily focused on FDI. By making a calculated effort to establish a large showcase project, Mozambican authorities reasoned that they would be able to credibly declare Mozambique open for business. After initially exploring a gas project whose concession had been acquired by Enron, in December 1995, the Ministry of Industry, Commerce, and Tourism

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[18] Edward George, "Economy (Mozambique)," *Europa World Online* (London: Routledge), http://www.europaworld.com/entry/mz.ec.
[19] Nicholas Stern, "The Role and Effectiveness of Development Assistance," in *UN Conference on Financing for Development* (Washington, DC, 2002), 39.
[20] Mark Plant, "Republic of Mozambique: 2009 Article IV Consultation (IMF Country Report No. 09/227)" (International Monetary Fund, June 19, 2009), 4.

welcomed a visit from executives from South Africa's Gencor Corporation. Gencor had just built an aluminum plant in Richards Bay, South Africa, some 400 kilometers south of Maputo. The plant had proven profitable but space constraints limited it from being expanded. Although Mozambique had no aluminum reserves, Billiton (which was divested from Gencor in 1997) would ship raw materials to Mozambique from its mines in Australia while relying on long-term contracts from the South African state electricity provider Eskom at competitive pricing. Mozambique's status under the Lomé Convention would allow duty free access to the European Union, further boosting competitiveness.

The project would be the largest investment in Mozambique ever at an estimated cost of $1.4 billion, or 82% of Mozambique's GDP.[21] Of this, a $120 million loan from the IFC would serve as the seal of approval for Billiton and facilitate the syndication of loans to make the project come to fruition. Coming online in mid-2000 and reaching full capacity by 2001 under budget by $120 million, the plant soon turned a profit for Billiton, leading to the launch of an expansion project (Mozal II) to double the plant's capacity at a cost of $860 million. By 2003, aluminum exports from Mozal accounted for 55% of the country's export earnings.

Mozambique's strong statist legacy from the Marxist era enabled a degree of coherence in its decision-making to cut through red tape and the government's sclerotic bureaucracies to make the project happen. The enormous cost of the project raised the stakes to such a degree to create the political imperative for no

[21] Benjamin C. Esty, *Modern Project Finance* (Hoboken, NJ: John Wiley & Sons, Inc., 2004), 359.

one ministry or individual to get in the way. As a result, the government was able to create sufficient political momentum to overcome myriad potential bureaucratic roadblocks ranging from taxes and customs, land tenure and resettlement, to environmental and labor issues.[22]

1.5 Growing Reliance on Extractive and Capital Intensive Industries

Following the completion of Mozal, a wide range of other heavy-industry FDI followed. South African energy giant Sasol invested in gas exploration and the construction of an 856 kilometer pipeline, completed in 2004. South African and international mining firms invested in a broad range of exploration projects, which had been deemed too risky during the civil war and before Mozal. By 2002, Mozambique was the fifth highest destination for FDI in sub-Saharan Africa, according to the United Nations Committee on Trade and Development. In 2007 alone, 186 FDI projects were approved worth $7.5 billion in the mining, tourism, services and agricultural sectors.

Mining provided only 0.5% of GDP as of 2006,[23] but the sector is expanding rapidly. In October 2010 the government put out to tenders for the Corridor Sands project, the world's largest known deposit of titanium dioxide, used in a wide range of applications including paint, food coloring, and sunscreen.[24] Mozambique has

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[22] Louis T. Wells, Jr., *Cutting Red Tape: Lessons from a Case-Based Approach to Improving the Investment Climate in Mozambique*, 110-111.
[23] Edward George, "Economy (Mozambique)."
[24] Jamie Freed, "BHP Loses Corridor Sands Project in Africa," *Australian Financial Review*, October 18, 2010, 15.

$2.3 billion in projects underway to exploit its coal resources.[25] Brazil's Vale is exploiting the Moatize mine, which with estimated reserves of 838 million metric tons, the company estimates is one of the largest unexploited coal reserves in the world. In February 2010, Anadarko Petroleum announced that it had made the first significant deepwater gas find in Mozambique.[26] Other mineral reserves include gold and tantalite, a mineral similar to coltan used in electronic capacitors.

1.6 Post-War Macroeconomic Trends: More Progress in Washington Consensus Goals than Broader Redistribution of Gains

A thorough review of Mozambique's post-war macroeconomic data reveals a country that has succeeded more at balancing its macroeconomic imbalances than improving the livelihoods of its citizens. While aggregate growth has been high, living standards have not kept up as unemployment and inequality have deteriorated. Most of Mozambique's success has been in following the orthodox policies of its lenders and donors: reduced external imbalances, lower inflation, and reduced external debt. Still, the country remains hugely dependent on foreign aid.

The following provides a detailed macroeconomic overview of the country's performance, beginning at the end of civil war in 1992 using the key indicators monitored by multilateral lenders and foreign investors.[27] The choice of 1992 as a threshold marks the beginning of the modern era in Mozambique not only on the

[25] Business Monitor International, "Mozambique Mining Report" (BMI, September 2010), 5.
[26] Neil Ford, "Mozambique: Stepping Up Africa's Success Story," *New African*, July 2010, 72.
[27] Matthew Weinzierl, "GUIDES: Insight Through Indicators" (President and Fellows of Harvard College, July 12, 2010), 2, Harvard Business School Case 9-710-044.

basis of the return to stability following the war but also the end of the Cold War and the apartheid regime in South Africa, both of which had conditioned the country's previous foreign aid flows. In addition, data are presumably more reliable since the end of the civil conflict. While a true counterfactual is impossible with this sort of macroeconomic data, the following can provide a sense of the country's trajectory since following its IMF-guided development program, which included the emphasis on megaprojects since 2000. Macroeconomic data are provided by the World Bank unless otherwise indicated.[28] A full list of key macroeconomic data is found in Appendix A.

- **Strong Overall Growth:** Between 1992 and 2008, GDP grew an average 7.6% annually in real terms. The World Bank attributes Mozambique's strong postwar growth to a combination of megaproject foreign investment, support from foreign donors, and agricultural growth.[29]
- **Declining But Ongoing External Imbalances:** Mozambique's trade deficit fell from a high of 25% of GDP but remains around 12%.
- **Volatile Levels of Foreign Investment:** Investment averaged 21% but showed significant volatility, peaking around the time of the launch of Mozambique's megaprojects.
- **Lagging Living Standards:** On a per capita basis, the rise in standards of living has not kept up with the total aggregate output. Purchasing Power

[28] "Data | The World Bank", http://data.worldbank.org/.
[29] "IMF Country Report No. 05/311: Republic of Mozambique Selected Issues and Statistical Appendix" (IMF, August 2005), 5.

Parity-adjusted per capita GDP grew only 4.6% in the overall post-war period, well below total output of 7.6%.

- **Chronically High Unemployment:** Mozambique's official reported unemployment has been high and held flat around 20-22% in the postwar period, although such estimates are largely notional in a country where 75% of the population is involved in subsistence agriculture. Among youth this number has been even higher, averaging around 33%.
- **Growing Income Inequality:** Although data are only available from 1997 and 2003, Mozambique's Gini Coefficient rose, from 44.5 to 47.1. By 2003, the top 20% of Mozambique's population received 53.3% of national income, compared to just 5.4% for the bottom 20%.
- **Low Inflation:** Mozambique lived up to its obligations under structural adjustment to reduce inflation and bring down interest rates. Inflation hit as high as 50-60% in the immediate aftermath of the war, based on either the CPI or GDP deflator, and steadily dropped in recent years; inflation averaged 13.2% in 2006, before decreasing to 8.2% in 2007 and rising to 10.3% in 2008. While real lending interest rates, in turn, fell from 18% in 1998 to 9.8% in 2008, the impact of this decline on the average household was likely small given low bank penetration rates.
- **Declining Government Debt:** Public sector debt stocks peaked in 1995, at 232% of GDP, but have steadily and consistently fallen since then, such that by 2008 public external debt had reached 28% of GDP. Much of the reduction came under terms of the World Bank's Heavily-Indebted Poor

Countries (HIPC) debt initiative, which wrote off $3.7 billion in debt in 1999; much of this debt had been to the Soviet Union and had been continually rolled over until Russia joined the Paris Club in 1997.[30]

- **Ongoing Fiscal Deficits:** The government has run a fiscal deficit every year since the end of the civil war. A centralized tax collection agency was not launched until 2005 and as of 2008 there were only 770,000 taxpayers out of a population of some 23 million.[31]
- **Uncompetitive Exchange Rate:** The nominal exchange rate has steadily depreciated since the end of the civil war, in line with IMF orthodoxy. However, according to the IMF, the real effective exchange rate remained overvalued 26-41% in 2008-2009, undermining the country's export competitiveness.
- **Continued Reliance on External Assistance:** Despite improved tax collection, external donors contributed 44% to the 2010 government budget.[32] While this share has fallen from 70% of gross national income in 1993, external aid continues to account for a high level of around 23% in recent years.

The "success" story that has served as a model for the international aid community thus comes with some important caveats. Mozambique's real growth has been impressive, but reform has come more in the form of a reduction of

[30] Edward George, "Economy (Mozambique)."
[31] Ibid.
[32] Ibid.

external imbalances in line with the Washington Consensus policy guidance than a sustained improvement in per capita living standards. With megaprojects receiving huge tax breaks, the government has been unable to eliminate its structural fiscal deficits -- and has had little incentive to do so because of steady flows of external financing. As overall output per capita has not kept up with the increase in overall output, Mozambique has suffered from sustained levels of unemployment and worsening inequality at the national level. An overvalued real exchange rate risks undermining the country's competitiveness outside of commodity exports, consistent with Dutch Disease of other countries reliant on commodity exports.

Tensions came to a boil in February 2008 when widespread riots broke out in response to increased fuel prices. Mozambique responded initially by providing subsidies, at an estimated cost of 1.2% of GDP. It later had to repeal these subsidies at the urging of its donors because they were not consistent with IMF orthodoxy.[33]

1.7 Conclusion and Outlook: A Vicious Circle

Mozambique now finds itself in a dangerous vortex of continued reliance on external aid and investment coupled with deteriorating governance, which was weak to begin with as result of the country's historical legacy. In October 2009 Mozambique held its fourth presidential and parliamentary elections and first provincial elections since the end of the civil war. Commonwealth and EU election observers viewed the race as less free and fair than previous elections, threatening Mozambique's relationship with the donor community. Aid was temporarily

[33] Ibid.

suspended in the first quarter of 2010 due to perceptions the government was not doing enough to combat corruption and address governance issues, as reflected in the drop in Mozambique's standing on Transparency International's 2008 Corruption Perception Index to 130 from 111 in 2007. Thirteen donors have since frozen aid levels while Switzerland and Sweden have reduced their commitments. Overall project pledges for 2011 have fallen to $263 million, from $334 million in 2010. Underscoring the importance of good governance to future investment decisions, Fitch Ratings highlighted as it as the top ratings driver: "any further deterioration in Mozambique's relationship with the aid community that leads to significant cuts in the concessional funding received would imperil its public and external finances and lead to negative rating action."[34]

This natural resource wealth will only exacerbate the legacy of rent-seeking and elite capture that began with the country's early dependence on foreign aid. Mozambique now risks being trapped in a vicious circle in which governance deteriorates and external donors, now facing fiscal challenges on their own, call for reductions in foreign aid; without the positive signal of foreign aid, investment then declines except by wildcat speculators who are likely to look for high margin investments exclusively in commodity exploration; and then finally, with the focus on commodity exports, political elites amplify their rent-seeking behavior, leading to heightened demand for more external aid.

Given the country's long history of dependence on foreign aid and its shift towards extractive industries, the Extractive Industries Transparency Initiative

[34] Purvi Harlalka, "Mozambique: Full Rating Report," 1.

(EITI) offers Mozambique one opportunity to address many of its shortfalls in governance that have plagued the Mozambican leadership since the colonial era. EITI is a coalition of governments, private companies, civil society groups, investors, and international organizations that aims to improve transparency and accountability in the extractives sectors.[35] EITI membership would help assuage the concerns of foreign investors while compliance with EITI best practices would likely have a positive impact on the country's bond rating. Mozambique is currently a candidate country until May 2011.[36] Rather than continuing to steadfastly follow the orthodox policy prescriptions of the Washington Consensus, the best practices of EITI would offer Mozambique a path to improved governance and perhaps allow a more equitable share of the country's wealth for its most vulnerable citizens who have so far been left behind.

[35] "EITI Fact Sheet" (EITI International Secretariat, March 30, 2011).
[36] "Mozambique | Extractive Industries Transparency Initiative", http://eiti.org/Mozambique.

Chapter 2: Econometric Impact Evaluation of Mozal

2.1 Stated Development Goals of the Mozal Project

While for reasons stated above the Mozal plant provided an important role in signaling to foreign investors that Mozambique was open for business, the project also aimed to provide direct economic development benefits. At the time, the project was the largest single non-financial project the IFC had ever funded so the project would have had to have clear development benefits to pass muster with the World Bank. As part of this process, the IFC prepared a detailed economic rate of return (ERR) model to determine the plant's health, safety, environment and socioeconomic impact. While the IFC does not share the details of this model, many of the broad contours of are available. The plant's development impacts were to come in two forms: direct economic effects in the form of jobs and industry backward linkages, and the charitable work of the Mozal Community Development Trust.

In terms of direct benefits, the IFC estimated Mozal would employ 5,000 workers during construction and some 800 afterwards; have positive spillover effects for local suppliers and manufacturers; and contribute 7% to GDP while increasing government tax receipts and foreign exchange earnings.[37] Internal Billiton documents indicate the construction of phases I and II of the project

[37] Louis T. Wells, Jr., *Cutting Red Tape: Lessons from a Case-Based Approach to Improving the Investment Climate in Mozambique*, 109-110.

contributed more than $160 million to the local economy in terms of employment and the use of local suppliers.[38]

Another key element of the project's development impact was the work of the Mozal Community Development Trust (MCTD).[39] Determining that the prevalence of malaria in the vicinity of the plant exceeded 85%, the Trust launched a malaria eradication campaign within a 10km radius of the plant; contributed to a regional malaria eradication program; and provided sewing machines and training for community members in making mosquito nets. As a result, infection rates in the industrial park around the park dropped in three years from 85% to 18.6%.[40] The Trust also educated some 200,000 on HIV prevention; established two health clinics around Maputo; built a school; and provided teacher training. Furthermore, the Trust established two vocational training centers and worked to provide capacity building for local small and medium enterprises in the vicinity of the plant.

A U.S. diplomat posted in Maputo from 2006-2008 described the externalities associated with Mozal as a "net positive." He noted the port, roads, and rails were all upgraded around Mozal and Maputo-Matola in a way that helped other industries grow, while the firm met its obligations to use local suppliers.[41] According to the current USAID country director in Mozambique, the plant was a keystone of the successful Maputo Corridor Project and its Maputo Witbank private toll road, "the

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[38] Laura P. Hartman, eds., *The Global Corporation: Sustainable, Effective, and Ethical Practices* (Routledge, 2009), 183.
[39] BHP Billiton, "Welcome To Mozal: Together We Make a Difference", November 2003, 40, www.bhpbilliton.com.
[40] Laura P. Hartman, *The Global Corporation: Sustainable, Effective, and Ethical Practices*, 184.
[41] James Potts, "Mozal Plant", October 26, 2010.

only road in Mozambique not subject to a cycle of donor construction, no maintenance, [and] donor reconstruction."[42]

2.2 Econometric Specification

While the macroeconomic story and political context presented in Chapter 1 provide a cautionary tale for Mozambique's policymakers or others considering a megaproject-led growth strategy, the lack of any counterfactual macroeconomic data make it impossible to confidently assign a causal link between this policy choice and particular development outcomes. Rather, the strongest evidence of the perils of Mozambique's megaproject-leg growth, vis-à-vis the failure to deliver upon the economic development goals on which the strategy was premised, can be found at the microeconomic level.

While it is clear from macroeconomic-level data that overall income inequality deteriorated in Mozambique between 1997 and 2003, survey data conducted by Demographic and Health Surveys provide the opportunity to assess the development impact of the Mozal plant on individual households.[43,44] Using a difference-in-differences econometric model, we can determine how the livelihood of residents in the industrialized areas near the plant changed compared to those in a neighboring province, which effectively serves as a control group for this analysis. Looking at the impact on a range of educational, well-being, and health indicators,

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[42] Tim Born, "Mozambique Background."
[43] "DHS Mozambique 1997 Final Report" (Demographic and Health Surveys), www.measuredhs.com.
[44] "DHS Mozambique 2003 Final Report" (Demographic and Health Surveys), www.measuredhs.com.

this model accounts for systematic differences that existed between the two groups prior to the intervention (i.e. Mozal coming online) as well as changes in the outcome variable of interest that occurred over time.

DHS polling data are available from 1997 and 2003, a time range which well bookends the opening of the Mozal plant in 2000. Thus comparing the livelihoods of individuals between our treatment (Maputo Province) and control group (Gaza Province) over the same period of time (1997 versus 2003), we hope to determine the impact of Mozambique's industrialization strategy (the so-called "treatment"). It should be noted the Maputo observations are limited to the non-urban parts of the province; polling from residents in the city of Maputo were collected separately and were not included in this analysis so as to make the two comparison groups more comparable. The Gaza observations are from the entire province and hence predominantly non-urban, helping the comparability of the two groups. The data set consisted of 1,661 females and 307 males in the pre-period, with 2,381 females and 393 males in the post-period. Given the large number of women sampled relative to men, all regressions were done using the entire population (columns 1-3 of Tables 1-3) and then separately using just the female data (columns 4-6 of Tables 1-3). Regressions were calculated using ordinary least squares with the following specification:

$$Y_{it} = \eta + \gamma d_i + \delta T_t + \alpha\, d_i * T_t + \phi X_{it} + u_{it}$$

Y_{it} = dependent variable of interest (listed in Tables 1-3)
d = 1 if in Maputo, = 0 if in Gaza
T = 1 if 2003, = 0 if 1997
α = difference in differences coefficient (interaction between T and d)
X_{it} = additional covariates, as specified at the bottom of Tables 1-3

Table 1

Difference in Difference Estimators of Impact on Educational Attainment								
Y_{it}		(1)	(2)	(3)		(4)	(5)	(6)
Education in Single Years		-0.57***	-0.61***	-0.54***		-0.64***	-0.64***	-0.54***
(continuous variable in years)		(0.17)	(0.16)	(0.15)		(0.18)	(0.17)	(0.15)
R^2		8%	15%	38%		8%	18%	38%
mean of control group in 1997	2.26				2.12			
	(2.49)				(2.38)			
Literacy		-0.11***	-0.11***	-0.11***		-0.12***	-0.12***	-0.11***
(=1 if literate, =0 if not)		(0.03)	(0.03)	(0.03)		(0.03)	(0.03)	(0.03)
R^2		4%	8%	21%		4%	11%	21%
mean of control group in 1997	0.46				0.42			
	(0.50)				(0.49)			
Control for Age		NO	YES	YES		NO	YES	YES
Additional Covariates		NO	NO	YES		NO	NO	YES
Women Only		NO	NO	NO		YES	YES	YES
Additional covarites include sex, marital status, religion, wealth proxies (access to running water, electricity, phone), employment status, sex of household head, and total number of children.								
Levels of Significance: *90%, **95%, ***99%								

Table 2

Difference in Difference Estimators of Wealth/Wellbeing								
Y_{it}		(1)	(2)	(3)		(4)	(5)	(6)
Access to Running Water		-0.04*	-0.04*	-0.08***		-0.07***	-0.07**	-0.08***
		(0.02)	(0.02)	(0.03)		(0.03)	(0.03)	(0.03)
R^2		12%	12%	28%		15%	16%	28%
mean of control group in 1997	0.12				0.14			
	(0.33)				(0.35)			
Access to Electricity		-0.00	-0.01	0.00		-0.00	-0.00	-0.00
		(0.02)	(0.02)	(0.02)		(0.02)	(0.02)	(0.02)
R^2		3%	3%	18%		3%	3%	18%
mean of control group in 1997	0.09				0.09			
	(0.28)				(0.28)			
Phone ownership		0.03***	0.03***	0.03***		0.03***	0.03***	0.03***
		(0.01)	(0.01)	(0.01)		(0.01)	(0.01)	(0.01)
R^2		1%	1%	6%		1%	1%	6%
mean of control group in 1997	0.01				0.01			
	(0.08)				(0.08)			
Refrigerator ownership		0.06***	0.06***	0.07***		0.06***	0.06***	0.06***
		(0.02)	(0.02)	(0.02)		(0.02)	(0.02)	(0.02)
R^2		4%	4%	18%		4%	4%	18%
mean of control group in 1997	0.05				0.05			
	(0.22)				(0.22)			
Motorcycle ownership		0.02*	.02*	.02		0.02*	0.02*	0.02
		(0.01)	(0.01)	(0.01)		(0.01)	(0.01)	(0.01)
R^2		1%	1%	3%		1%	1%	3%
mean of control group in 1997	0.08				0.08			
	(0.27)				(0.27)			
Number of Children Born in Last 5 Yrs		-0.11**	-0.11**	-0.07*		-0.11**	-0.11**	-0.07*
		(0.05)	(0.05)	(0.04)		(0.05)	(0.05)	(0.04)
R^2		0%	0%	35%		0%	0%	35%
mean of control group in 1997	0.71				0.71			
	(0.81)				(0.81)			
Currently Employed (Women)						-0.21***	-0.21***	-0.20***
						(0.03)	(0.03)	(0.03)
R^2						9%	18%	22%
mean of control group in 1997					0.53			
					-0.5			
Control for Age		NO	YES	YES		NO	YES	YES
Additional Covariates		NO	NO	YES		NO	NO	YES
Women Only		NO	NO	NO		YES	YES	YES
Additional covariates include marital status, religion, educational attainment, employment status, total number of children born, and sex of household head.								
Levels of Significance: *90%, **95%, ***99%								

Table 3

Difference in Difference Estimators of Health				
Y_{it}		(1)	(2)	(3)
Visited Health Clinic in Last 12 Months (Women Only)		-0.44***	-0.44***	-0.40***
		(0.03)	(0.03)	(0.03)
R^2		9%	9%	17%
mean of control group in 1997	0.42			
	(0.49)			
Number of Tetanus Injections Pre-Birth (Women Only)		0.26***	0.27***	0.28***
		(0.10)	(0.10)	(0.10)
R^2		11%	11%	12%
mean of control group in 1997	1.12			
	(1.11)			
Ever Received a Vaccine (Women Only)		-0.21***	-0.21***	-0.19**
		(0.07)	(0.07)	0.08
R^2		17%	18%	22%
mean of control group in 1997	0.65			
	(0.48)			
Recent Suffering from Diarrhea (Women Only)		-0.33**	-0.32**	-0.36***
		(0.14)	(0.14)	(0.14)
R^2		0%	1%	3%
mean of control group in 1997	0.36			
	(0.93)			
Ever heard of AIDS (Men and Women)		-0.10***	-0.10***	-0.11***
		(0.01)	(0.01)	(0.01)
R^2		8%	8%	12%
mean of control group in 1997	0.86			
	(0.35)			
Ever heard of AIDS (Women Only)		-0.12***	-0.12***	-0.11***
		(0.01)	(0.01)	(0.01)
R^2		9%	10%	12%
mean of control group in 1997	0.84			
	(0.36)			
Control for Age		NO	YES	YES
Additional Covariates		NO	NO	YES
Additional covarites include marital status, religion, educational attainment, employment status, total number of children born, proxies for wealth (electricity, phone, running water), and household head sex.				
Levels of Significance: *90%, **95%, ***99%				

2.3 Key Assumptions

The model relies on the first key assumption that both Maputo and Gaza would have continued on parallel trends in the absence of treatment (i.e. if Mozal had not been built). Because previous time series data were not available allowing to test the validity of this assumption, we test the sample means of all variables in the 1997 period across both provinces looking for systematic differences between the regions as a proxy for parallel trends. This test is done by regressing each of the dependent and independent variables in the study on the dummy variable for province; this is done in the pre-period only while also specifying robust standard errors to control for heteroskedasticity and serial correlation. Where systematic differences occurred between the groups creates the possibility for bias, which is discussed in detail in the findings below with regards to the specific outcome variables of interest. Broadly speaking, however, the bias tends to underestimate the treatment effect because the treatment group started out at a higher level in the pre period and the difference in difference coefficient takes on a negative value. See Table 4 below for the test of parallel trends.

Table 4

Testing for Parallel Trends			
reg X regiondum if time==0, robust			
	intercept (i.e. mean for Gaza)		
	coefficient (i.e. differential for Maputo)		
indicates Maputo starts out at a higher level with statistical significance in the pre-period --> potential underestimate of treatment effect			
indicates Maputo starts out at a lower level with statistical significance in the pre-period --> potential overestimate of treatment effect			
education in years	2.28***	runningwater	0.12***
	1.65***		0.33***
literacy	0.46***	electricity	0.09***
	0.21***		0.10***
kids born last 5 yrs	0.71***	phone	0.01***
	-0.03		0.00
total kids	2.94***	fridge	0.05
	-0.16		0.05***
kids last year	0.18***	currently employed	0.53***
	-0.01		-0.06***
sex	0.14***	clinic in last year	0.42***
	0.04**		0.22***
age	29.2***	tetanus injections	1.12***
	-0.18		-0.14
christian	0.59***	ever vaccined	0.65***
	0.14***		0.32***
muslim	0.01***	recent diarrhea	0.36***
	0.00		0.29***
no/other religion	0.39***	AIDS knowledge	0.86***
	-0.18***		0.10***
widowed	0.02***	never married	0.21***
	-0.02***		0.09***
divorced	0.00***	married	0.06***
	0.00**		-0.01
not living together	0.11***	living together	0.60***
	0.01		-0.08***

The validity of findings also relies on the assumption that the individuals interviewed in 1997 are similar to those interviewed in 2003. The DHS data were cross-sectional rather than panel in nature, indicating that the same exact individuals were not polled in both periods but rather the studies attempted to target similar types of individuals. A comparison of means test was used looking at time-invariant characteristics in the pre- and post data (see Table 5 below). This test indicated both the pre- and the post-period data had the same share of men and women interviewed and the same proportion of respondents from each province. The time invariant characteristics over which the pre- and post-periods differed was the gender composition of their household heads and religious composition, a phenomenon that will be examined further below.

Table 5

Testing for Consistency of Cross-Sectional Data	
ttest variable, by(time)	
indicates no statistically significant difference in means between pre and post	
sex	t-value = 1.37. Unable to reject the null that the difference in means is zero.
christian	t-value = 34.5. Reject the null that the difference in means is zero.
muslim	t-value = -23.7. Reject the null that the difference in means is zero.
no/other religion	t-value = -5.78. Reject the null that the difference in means is zero.
regiondum	t-value = -1.30. Unable to reject the null that the difference in means is zero.
sexHHhead	t-value = 8.55. Reject the null that the difference in means is zero.

Finally, this analysis is premised on the key assumption that the direct and indirect effects of the Mozal project were limited to Maputo Province. With the Maputo Corridor Project running only through Maputo Province en route to South Africa, it is a reasonable assumption that spillover effects were limited to this region alone. (See Appendix B for a map of Mozambique.) This assumption also appears valid with respect to the work of the Mozal Community Development Trust, which was limited by its charter to conducting work within the vicinity of the plant.

2.4 Findings

Individuals in Maputo Province fared much worse than those in Gaza with respect to educational attainment (see Table 1). The total number of years of educational attainment declined about half a year compared to the pre-treatment average in the control group of about 2 ¼ years. Literacy also declined by 10 percentage points compared to around 46% in the control group in 1997. These findings were significant at the 99% level. Any bias in the findings is likely to underreport this negative treatment effect since Maputo started out with higher educational attainment and literacy than Gaza in 1997. According to Table 4, those sampled from Maputo prior to Mozal's construction were better educated than the average Gazan (with an average 3.9 years of total education compared to 2.3 years) and more literate (67% versus 46%). Given the small number of men in the study, the same findings also hold when the men are dropped from the analysis.

Maputo's industrialization had mixed effects with regards to indicators of wealth and wellbeing (see Table 2). Access to running water in Maputo fell round

six percentage points compared to the pre-treatment control level of around 13% (valid at least the 90% level depending on the specification used). Female employment also fell around 21 percentage points in Maputo compared to a pre-treatment control of 53%. However, gains in the ownership of material assets were higher. Relative to the 1997 control group mean of 1 percent, the treatment group's phone ownership rose 3 percentage points (valid at the 99% level), while ownership of a refrigerator rose around 6 percentage points (valid at the 99% level) from a 1997 control group mean of 5%. The average number of children born to Maputans dropped around 0.11 compared to the Gazans 1997 control of 0.71 (valid at the 95% level).

As was the case with the educational indicators, in most cases any bias would tend to underreport the negative treatment effect of industrialization for these wealth and wellbeing variables. According to Table 4, Maputo started out with higher (or insignificantly different) levels of access to running water, phone ownership, number of children born in the last five years, and refrigerator ownership. One exception, however, was that women in Maputo were less likely to have been employed to begin with, which could overestimate the treatment effect.

The impact of industrialization is least clear with regards to health indicators (see Table 3). Most of the findings are limited to women since the DHS surveys did not address similar questions to men. Those in the treatment group had gained relative to the control in terms of the numbers of tetanus shots received (an increase in 0.25 shots compared to a 1997 control group average of 1.12 shots, valid at the 99% level) and they were approximately 31 percentage points less likely to

have suffered from diarrhea in the last two weeks (compared to a 1997 control group average of 36%, valid at 95% level). However, they were around 19 percentage points less likely to have ever received a vaccine (compared to a 1997 control group average of 65%, valid at the 95% level) and around 43 percentage points less likely to have visited a clinic in the last 12 months (compared to a 1997 control group average of 42%, valid at the 99% level). Among women and men, Maputans were around 11 percentage points less likely to have to ever heard of AIDS when compared to the 1997 control group average of around 85% (valid at the 99% level). Returning to Table 4, with regards to potential biases, Maputans in the pre-period were more likely to have been to a clinic recently, have ever received a vaccine, heard of AIDS, or suffered from diarrhea in the last two weeks; all of these factors would tend to underestimate the treatment effect.

2.5 Hypotheses for Findings

This econometric impact evaluation analysis paints a highly negative picture of the development impacts of industrialization in the Mozal corridor between 1997 and 2003. Turning first to educational attainment, the drop in educational attainment and literacy suggests the efforts of the Mozal Community Development Trust to promote literacy did not deliver on their goals over this period. Individuals in the vicinity of the plant may have come to the realization that education was not the path to better wellbeing by shifting their efforts away from schooling towards commercial activity in the Mozal corridor. Alternatively, migration could be a factor in the discrepancy of the results. As Table 5 noted, there were systematic

differences between the groups sampled in 1997 and 2003 with regards to gender of household head and religion, both of which are variables unlikely to change much over time. The development around Mozal therefore could have contributed to a migration of less-educated laborers to the area around the plant in search of economic opportunity, and therefore not point to a drop in the attainment of those who were already living there. Regardless of the explanation, however, overall educational achievement fell in the area around Mozal over the course of the area's economic development, a phenomenon not conducive to long-term economic growth.

With regards to estimators of wealth and wellbeing, it appears the industrialization around Mozal had the greatest impact on individuals' ability to purchase physical assets such as phones and refrigerators. This is consistent with the development goals of increasing incomes not only of plant employees but also those of the surrounding community through spillover effects from demand for related industries. The increase in phones, however, could be better explained by greater expansion of telephone networks in Maputo over Gaza during this period rather than greater demand conditions among recipients, something beyond the scope of this analysis. The drop in running water in Maputo compared to the control group is consistent with the high degree of change occurring in the Maputo Corridor as a result of general industrialization; it also tracks with the hypothesis of migration, as more workers flooded into the region and perhaps had to find makeshift housing for themselves, leading to the creation of slum living conditions in the vicinity of the industrial corridor. The drop in female employment could be

considered a good sign of development, since perhaps the surveyed women's husbands or other male relatives made more money and therefore reduced the need for female employment. Alternatively, it could be a sign of labor migration; the number of Muslims sampled in 2003 greatly exceeded those sampled in 1997 (694 compared to 26), so the drop in female employment could be a function of the cultural norms of a shifting population that contained more Muslims over time. Finally, the well-being implications of the number of children born are ambiguous, as the decline in births could reflect a decreased ability to care for additional children (suggesting a drop in livelihoods) or less need for household labor and security that come from a larger family (suggesting an increase in livelihoods).

The findings regarding health are the most ambiguous of the study. The drop in visits to clinics in Maputo compared to the control group is consistent with the idea of the growth of slum living conditions, but this and the drop in access to running water appear to contradict the logic of a drop in recent suffering from diarrhea. The vaccination findings are similarly ambiguous, with the number of tetanus injections rising around Mozal accompanied by a drop in the share of individuals who had ever been vaccinated. The hypothesis of migration could explain some of these discrepancies, allowing for the conclusion that many of those sampled in 2003 were very different populations with different health histories than those sampled in the pre-period. The drop in AIDS awareness in the industrializing corridor is consistent with the educational findings detailed above; those with lower levels of education and literacy are likely to be less aware of public health matters such as AIDS.

2.6 Policy Implications

While the data used in this study do not account for longer-term development impacts because the post intervention data were just three years after the construction of Mozal, these results suggest high levels of investment alone are unlikely to sufficiently improve livelihoods of residents in nearby communities in the short run through simple spillover without more targeted development efforts. On the one hand, the increased ability of residents to purchase assets such as telephones and refrigerators is a positive sign that industrialization can lead to greater incomes in surrounding communities. However, more effort must be taken to address educational opportunities (including public health awareness such as AIDS awareness) around large investment projects, whether because less educated individuals choose to migrate to these areas in search of jobs or because residents perceive the short-term benefits from employment to outweigh the long-term benefits of pursuing further education. Careful attention must also be made to the impact on female employment, which appears to have declined in this case even though the causal mechanism for this is not clear. Finally, the DHS data point to the possible development of slums that come with fast-paced development and migration around large industrial projects like Mozal, which may account for some of the ambiguous health impacts of development, and which should be better factored into the planning of future industrial corridors.

Appendix A: Macroeconomic Indicators for Mozambique

APPENDIX

Indicator	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Growth																		
GDP (constant 2000 US$ million)	2621	2488	2703	2886	2964	3183	3509	3887	4203	4249	4754	5173	5485	5918	6414	6971	7483	7991
GDP (constant LCU million)	53037	50329	54685	58385	59962	64399	70992	78647	85031	85959	96187	104668	110973	119722	129764	141030	151398	161671
Real GDP growth rate		-5.1%	8.7%	6.8%	2.7%	7.4%	10.2%	10.8%	8.1%	1.1%	11.9%	8.8%	6.0%	7.9%	8.4%	8.7%	7.4%	6.8%
Annual Real Growth 1992-2008: 7.6%																		
Components of GDP (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Household Consumption	99.0	99.3	102.4	98.6	90.3	88.1	83.9	86.3	92.1	79.5	87.2	77.5	85.7	83.9	82.0	79.0	81.0	81.7
Government Expenditure	9.6	11.8	11.5	13.0	8.1	6.3	6.8	7.7	8.5	9.0	9.1	9.4	10.2	10.8	10.4	10.7	11.7	12.1
of which military expenditure	2.6	3.0	2.9	3.3	1.5	1.1	1.1	1.1	1.2	1.3	1.2	1.3	1.3	1.4	0.9	0.8	0.9	0.9
Investment	16.2	19.8	20.4	22.3	27.0	20.2	20.6	18.3	20.0	31.0	20.0	30.0	22.3	18.7	18.7	17.7	17.9	18.5
Exports	10.2	13.1	12.9	14.1	15.6	14.8	13.4	12.2	13.2	17.5	24.6	27.7	29.0	31.4	32.5	39.7	36.9	33.3
Imports	34.9	43.9	47.3	48.0	41.0	29.5	24.6	24.6	33.7	37.0	40.9	44.6	47.2	44.8	43.6	47.1	47.6	45.7
Drivers of GDP Growth																		
TFP						average annual growth for 1996-2004: 4.3%													
Factor accumulation (60%L, 40%K)						average annual growth for 1996-2004: 4.2%												
GDP per capita, PPP (constant 2005 international $)	409.906	376.68	394.42	405.85	402.98	420.01	450.48	486.35	512.57	504.77	549.86	582.4	601.12	631.68	667.45	707.77	741.88	774.06
growth rate		-8.1%	4.7%	2.9%	-0.7%	4.2%	7.3%	8.0%	5.4%	-1.5%	8.9%	5.9%	3.2%	5.1%	5.7%	6.0%	4.8%	4.3%
Spread Between Real Growth Rate and GDP/capita		3.0%	3.9%	3.9%	3.4%	3.2%	3.0%	2.8%	2.7%	2.6%	3.0%	2.9%	2.8%	2.8%	2.7%	2.6%	2.5%	2.4%
Unemployment & Utilization																		
Adult (Age 15+) Unemployment (%)	20.1	20.2	20.3	20.4	20.6	21.0	21.3	21.5	21.6	21.5	21.7	21.7	21.7	21.8	21.9	22.0	22.0	22.1
Youth (Age 15-24) Unemployment (%)	33	32.9	32.6	32.5	32.4	32.4	32.4	33.0	33.3	33.3	33.8	33.7	33.8	33.9	34.1	34.2	34.3	34.3
Gini Coefficient							44.5						47.1					
Income share held by highest 10%	-	-	-	-	-	-	36.2	-	-	-	-	-	39.2	-	-	-	-	-
Income share held by highest 20%	-	-	-	-	-	-	50.8	-	-	-	-	-	53.3	-	-	-	-	-
Income share held by lowest 10%	-	-	-	-	-	-	2.4	-	-	-	-	-	2.1	-	-	-	-	-
Income share held by lowest 20%	-	-	-	-	-	-	5.7	-	-	-	-	-	5.4	-	-	-	-	-
Capacity Utilization												51.2%				59.1%		
Inflation & Interest Rates																		
CPI % change (base year=2005)		45.5%	42.2%	63.2%	54.4%	48.5%	7.4%	1.5%	2.9%	12.7%	9.0%	16.8%	13.4%	12.7%	7.2%	13.2%	8.2%	10.3%
GDP deflator (annual % change)		35.0%	45.9%	55.7%	51.2%	64.9%	9.0%	5.4%	4.4%	12.0%	14.9%	8.4%	5.2%	7.5%	8.8%	9.3%	7.5%	7.7%
Nominal lending interest rate (%)	-	-	-	-	-	-	-	24.4	19.6	19.0	22.7	26.7	24.7	22.1	19.5	18.6	19.5	18.3
Real lending interest rate (%)	-	-	-	-	-	-	-	18.0	14.6	6.3	6.8	16.9	18.5	13.6	9.8	8.5	11.2	9.8
Domestic credit provided by banking sector (% of GDP)	13.5	9.6	3.8	5.8	5.4	1.9	3.1	3.1	6.4	10.8	9.2	12.2	10.2	8.1	8.3	8.1	10.0	14.2
Debt & Deficits																		
Long-term private sector debt stock (% of GDP)	0.6%	0.9%	0.9%	76.4%	78.7%	58.0%	51.0%	41.4%	39.3%	40.4%	38.0%	36.0%	1.7%	7.2%	0.0%	0.0%	0.0%	0.0%
Long-term public sector debt stock (% of GDP)	160.9%	238.8%	238.8%	241.3%	231.8%	168.6%	138.9%	142.2%	109.5%	111.4%	63.1%	68.7%	67.7%	64.6%	55.9%	32.5%	30.3%	28.3%
External debt stocks (% of GNI)	185.6%	285.7%	280.3%	369.3%	360.6%	251.3%	213.6%	207.5%	170.3%	180.4%	129.3%	125.0%	86.9%	89.2%	73.3%	45.7%	41.4%	39.4%
Concessional debt (% of total external debt)	50.7%	51.3%	55.0%	44.6%	39.4%	42.3%	41.7%	48.4%	50.8%	49.7%	47.7%	52.6%	76.1%	72.6%	77.9%	72.4%	76.8%	77.6%
Interest arrears, private creditors (% of GDP)	2.4%	0.9%	0.1%	0.2%	0.2%	0.1%	0.0%	0.1%	0.0%	0.2%	0.2%	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Interest arreas, official creditors (% of GDP)	3.7%	6.9%	7.1%	7.7%	10.9%	5.1%	5.3%	5.9%	3.8%	9.5%	6.8%	7.3%	7.8%	7.6%	8.2%	7.4%	5.2%	5.0%
Fiscal Balance (% of GDP)	-10%	-10%	-11%	-13%	-9%	-7%	-8%	-6%	-7%	-11%	-13%	-17%	-14%	-12%	-9%	-12%	-13%	-12%
External Balances & Exchange Rates																		
Current Account Balance (current millions of $)	-344.3	-352.3	-446.3	-467.2	-444.7	-420.5	-295.6	-429.3	-912	-763.6	-657.2	-869.1	-816.5	-607.4	-760.7	-773.2	-785.3	-975.3
Current account balance (% of GDP)	-12.8%	-17.9%	-22.0%	-21.6%	-19.8%	-13.2%	-7.9%	-10.1%	-20.5%	-18.0%	-16.1%	-20.7%	-17.5%	-10.7%	-11.6%	-10.9%	-9.8%	-9.9%
Portfolio Investment (% of GDP)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Financing via international capital markets (gross inflows, % of GDP)	0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	0.0%	0.0%	0.0%	9.9%	0.8%
Foreign direct investment, net inflows (% of GDP)	0.83%	1.28%	1.58%	1.62%	2.00%	2.28%	1.72%	5.02%	8.58%	3.28%	6.27%	8.27%	7.22%	4.29%	1.64%	2.17%	5.31%	5.96%
Net ODA received (% of GNI)	41.9%	81.3%	63.2%	60.9%	51.4%	29.4%	26.5%	25.8%	19.3%	22.5%	25.5%	56.1%	23.4%	22.2%	20.9%	24.5%	24.2%	22.0%
Net ODA received per capita (current US$)	$76.8	$101.9	$79.1	$77.8	$66.6	$53.9	$56.1	$60.0	$46.0	$49.5	$51.3	$115.3	$53.0	$61.2	$62.3	$75.0	$81.3	$89.1
Official exchange rate (metical per US$, period average)	1.4	2.5	3.9	6.0	9.0	11.3	11.5	11.9	12.8	15.2	20.7	23.7	23.8	22.6	23.1	25.4	25.8	24.3
Mozambique GDP deflator	7.4	10.0	14.7	22.8	34.5	56.9	62.0	65.3	68.2	76.4	87.7	95.0	100.0	107.5	116.9	127.8	137.4	148.0
USA GDP deflator	84.5	86.4	88.4	90.3	92.1	93.8	95.4	96.5	97.9	100.0	102.4	104.2	106.4	111.2	114.9	118.6	122.0	124.6
Real Exchange Rate (based on US and Mozambique GDP deflator)	16.3	21.7	23.4	23.9	24.1	18.6	17.8	17.5	18.3	19.9	24.2	26.0	25.3	23.4	22.7	23.6	23.0	20.5
Savings & Investment																		
Gross domestic savings (% of GDP)	-8.6	-11.1	-13.9	-11.6	1.5	5.6	9.3	6.0	-0.6	11.5	3.7	13.1	4.1	5.2	7.6	10.3	7.2	6.1
Gross savings (% of GDP)	4.4	5.4	2.6	5.6	8.7	7.3	12.9	8.4	-1.6	11.5	1.6	24.2	4.7	8.8	8.1	9.3	6.0	6.8

Source: World Bank, IMF, Ministry of Planning & Development, Ministry of Finance.

Appendix B: Timeline of Major Development Projects in Mozambique

July 1998	Construction of the $2b Mozal aluminum smelter begins
June 2000	First metal cast at Mozal
August 2003	Phase II of Mozal completed
February 2004	First gas pumped to South Africa via SASOL pipeline
November 2004	Vale (Brazil) wins bid to exploit the Moatize coal mine
April 2007	First phase of the Moma titanium mine completed

Appendix C: Mozambique Map

Source: Google Maps.

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