The Effects of Oil and Gas Dominance in

Trinidad and Tobago

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Abstract

Economic theory suggests that countries with an abundance of natural resources should perform better that those without. Yet there are many exceptions regarding states that underperform or suffer tremendously due to this endowment. Small island developing states are believed to be dependent on their natural resources such as oil and gas. However, small island developing states face unique challenges in the context of sustainable development, including vulnerabilities to external shock, dependence on international trade, and fragile economic environments. Trinidad and Tobago is one such example of a small island developing state with an abundance of oil and gas, to which its economic success is due. When compared to selected small island developing states, Trinidad and Tobago appears to be an outlier, with a higher GDP and natural resource contribution to GDP as well as higher property rights, government integrity, government spending, business freedom, and trade freedom scores. Statistical regression analysis suggests that the data supports a portion of the claims made by the natural resource curse. However, the correlation coefficients for each of the variables tested for suggest that concrete conclusions cannot be drawn from this data set.

Introduction

The presence of oil and gas is essential in the economic structure of Trinidad and Tobago. Its economy is primarily industrial with an emphasis on oil and gas. Thanks to this specialization, Trinidad and Tobago is one of the wealthiest nations in the Caribbean. Its economic success thus far is largely dependent on the success of its energy sector, which constitutes the totality of all industries involved in the sale and production of energy sources including petroleum, fuel, natural and coal gas, and ammonia. Much of the nation's wealth is derived from its oil and gas reserves which account for over 40% of GDP and 80% exports (Heritage.org). This paper will use the case of Trinidad and Tobago to explore the extent to which natural resources are a curse on small island developing states (SIDS). This paper will explore the consequences of its dominant oil and gas industry as well as how Trinidad and Tobago's performance compare to that of other small island developing states.

Chapter 1 will discuss problems facing small island developing states. This will highlight exclusive issues that small state economies face that may potentially contribute to their economic difficulties. Chapter 2 will discuss the natural resource curse and its presence in Trinidad and Tobago. Evidence of oil and gas dominance, with a focus on Trinidad and Tobago's economic performance in response to its three oil booms will also be presented in this chapter. Chapter 3 will highlight the role political institutions play in Trinidad and Tobago's economic performance. It will address various policies put in place to encourage the country's industrialization in response to the nation's oil booms. Chapter 4 will detail the effects of oil and gas dominance in Trinidad and Tobago over the past four decades. Chapter 5 will show a comparison of Trinidad and Tobago and twenty-seven of the fifty-eight small island developing states during the period of 1995-2016. These nations are selected based on accurate data availability primarily from Heritage.org and The World Bank. Since oil and gas are the economy's main driving force, this paper will show how Trinidad and Tobago's economy fares when compared to economies with a similar or greater level of total natural resource rents as a percentage of GDP. The economic rent of a natural resource equals the value of the total sum of oil rents, natural gas rents, mineral rents, and forest rents that account for the total contribution of natural resources to economic output as a percentage of GDP. Oil rents are the "difference between the value of crude oil production at world prices and the total costs of production" (WorldBank.org). Similarly, natural gas rents are the difference between natural gas production and the total cost of production. Lastly, average property rights, government

integrity, government spending, business freedom, and trade freedom scores will be used to make comparisons to evaluate the scope of Trinidad and Tobago's economic development.

Chapter 1: Problems Facing Small Island Developing States

Small island developing states (SIDS) are a group of small island economies that suffer from specific vulnerabilities arising from several factors related to their size. The United Nations Department of Economic and Social Affairs recognizes 58 small state members separated into the following three categories: the Caribbean Community, the Pacific Islands, and the Indian Ocean Commission. SIDS are generally characterized by populations less than 1.5 million although there are few exceptions. Included in this list are Papua New Guinea, Haiti, and Jamaica which have higher populations but share similar characteristics.

The very characteristics that make these small states unique also inhibit them from achieving sustained economic development. SIDS are often reliant on the import of low fossil fuels, spending a great deal of their GDP on energy imports. Trinidad and Tobago is an exception to this as approximately 80% of its exports are petroleum and energy related products. Moreover, private sector led growth can be difficult for small states to achieve because a narrow population generally signifies a low demand for goods and services as well as a less diversified labor force. This, in turn, restricts the possibility of a diverse market that may satisfy international demand because production is geared towards a domestic market. The location of many of these islands may incur economic cost as they are far removed from international trade partners. This lack of connectivity results in costlier domestic production as imports are taxed due to location. Also, due to location is poor IT, connectivity which directly affects the service sector. Many Pacific islands for instance struggle with poor internet broadband and poor submarine fiber optic cables despite their efforts to remedy these problems. Another location restraint facing these small states is their ability to provide public services to scattered populations. Small states, especially Pacific islands struggle to provide healthcare, education, and infrastructure to its dispersed populations. In Trinidad and Tobago for instance, it is both difficult and costly to provide services to Tobago. This is done exclusively by boat, which is a slow and costly process. This is also the case for Papua New Guinea, Fiji, and other SIDS.

Small island developing states are generally characterized by small populations, geographic remoteness, lack of diversification, and overall unstable economies. For these reasons,

some economists and political scientists believe that small island developing states are inherently vulnerable to external shocks. They are disproportionally affected by global economic crises and are therefore slow to recover. Their growth and development are hindered by limited population size, their difficulty integrating into the global economy, their near inability to create economies of scale with a narrowed resource base. There is much literature supporting that island nations are well endowed with natural resources but the chart below which shows total natural resource rents as a percentage of GDP suggests otherwise. Approximately half of these small island developing states have no natural resources. There are only seven states whose natural resources attribute considerably to its overall GDP. Figure 1 below shows all the small island developing states and their percentage contribution to GDP.

While small states face undeniable economic and drawbacks, several economists support that size alone is not substantial evidence for any economy's stifled growth. In one paper examining empirical evidence of the disadvantages facing small island developing states, researchers conclude that these economies operate differently but their overall performance is not entirely attributed to their size and location. Within a group of selected SIDS in the Caribbean, small states outperformed their larger counterparts in terms of having a greater degree of openness, economies geared toward tourism and agriculture, and political stability that is apparent in its macroeconomic framework. Conversely, it is found that per capita GDP growth rates are more volatile in small states as a result of their openness and vulnerable to the international trade and fluctuations (Easterly 3). It is then argued that small states may take advantage of their natural resources to offset these external shocks (Kuznets). However, Figure 1 suggests that most small state economies have low levels of total natural resource contribution to GDP and therefore cannot gain considerable revenue from these.

Figure 1. Average Small Island Developing States' Natural Resource Contribution to GDP (1995-2016)

SIDS	Lowest	SIDS	Median	SIDS	Highest
American Samoa	0	Singapore	0.001	Bahrain	6.595
Anguilla	0	Micronesia	0.013	Solomon Islands	9.543
Antigua and Barbuda	0	Maldives	0.021	Trinidad and Tobago	13.726
Aruba	0	Saint Lucia	0.024	Suriname	14.573
Bermuda	0	Mauritius	0.034	Guinea-Bissau	18.421
British Virgin Islands	0	Kiribati	0.042	Guyana	20.948
Cayman Islands	0	Saint Vincent and the Grenadines	0.057	Papau New Guinea	25.909

Commonwealth of Northern Marianas	0	Dominica	0.065
Cook Islands	0	Seychelles	0.071
Cuba	0	Tonga	0.079
Curacao	0	Bahamas	0.109
French Polynesia	0	Barbados	0.285
Grenada	0	Timor-Leste	0.458
Guadeloupe	0	Cabo Verde	0.624
Guam	0	Vanuatu	0.777
Marshall Islands	0	Haiti	0.846
Martinique	0	Samaoa	1.374
Monserrat	0	Dominican Republic	1.436
Nauru	0	Belize	1.444
New Caledonia	0	Fiji	1.580
Niue	0	Comoros	2.046
Palau	0	Pacific Small States	2.115
Puerto Rico	0	Sao Tome and Principe	3.508
Saint Kitts and Nevis	0	Jamaica	5.177
Sint Maarten	0		
Turks and Caicos	0		
Tuvalu	0		
U.S Virigin Islands	0		

Sources: WorldBank.org

These economies face marginalization due to their vulnerability to external shocks including natural disasters and various financial volatilities. Small states' vulnerability to external shocks makes them reliant on the performance of larger economies. Vulnerability is not equivocal to poverty or economic failure. Trinidad and Tobago and benchmark country Singapore are two such examples; they have had successful economic growth despite their vulnerabilities. Vulnerabilities are measured by three indicators: "openness to international trade, export concentration and dependence on strategic imports" (2017 Brussels Development Briefing). Director Briguglio of the Islands and Small States Institute at the University at Malta supports that some small island economies, including Mauritius and Barbados, are not necessarily vulnerable; he attributes their resilience to their successful economic governance. Briguglio supports that "small island developing states are in most need of building their resilience through good economic governance, stable macroeconomic policies, market efficiency, and social development" (2017 Brussels Development Briefing).

Each of these studies point to the importance of ensuring and sustaining a well-diversified economy through political structures. This essentially suggests that many of these issues facing small island developing economies bring into question the strength of political structures in the state. Political structures have a large hand in determining how well its industry, agriculture, and

service sectors will perform. GDP sector contribution by composition often time reflects political consideration.

Chapter 2: What is the natural resource curse? Evidence of oil and gas dominance in Trinidad and Tobago

With wealth of oil and gas, the economy of Trinidad and Tobago has undergone major changes in its post-independence history. Upon diversification of the energy sector, fossil fuels have expanded to increase the production of derivatives from crude oil. Trinidad and Tobago's economy has many characteristics described in the natural resource curse. Political scientists and economists argue that "oil, mineral, and gas wealth is distinct from other types of wealth because of its large upfront costs, long production timeline, site-specific nature, scale (sometimes referred to as large rents), price and production volatility, non-renewable nature" (resourcegovernance.org).

Trinidad and Tobago has weathered a quite volatile economy due to its oil dependence and lack of diversification. Many issues affecting Trinidad and Tobago's economic growth are historically common to oil and gas rich countries, such as volatility and the underdevelopment of the non-energy sector. The natural "resource curse refers to the paradox in which countries with an abundance of non-renewable natural resources such as fossil fuels tend to experience less economic growth, worse development outcomes," or even economic contraction (Investopedia.com). The nature of commodity markets make the economy of resource rich countries vulnerable to boom and bust cycles. These resource rich nations often experience economic growth rates lower than those of countries without an abundance of resources. One such example of this inverse relationship is Venezuela's unstable economy. Oil accounts for approximately 95% of Venezuela's exports and 25% of its GDP (crf.org). This largely oil and gas based economy is experiencing external shocks due to its heavy dependence on oil. Its energy dependence coupled with its unstable political institution results in its economic downfall. Similarly, Trinidad and Tobago did not sustain growth even after discovering large oil and gas reserves on two separate occasions. In some aspects, Trinidad and Tobago appeared worse off after each oil boom. This is in part due to poor investments and expenditures, negligence of the non-energy sector, and poor fiscal structures. While this situation may not be unique, it is important to

identify specific conditions under which the resource curse was able to develop in Trinidad and Tobago and small island developing states alike.

The natural resource curse implies a negative relationship between the abundance of natural resources and citizen's well-being. Economists, sociologists, and political scientists use the concept of the oil curse to explain adverse effects of overreliance on a single resource. Overreliance on any one resource results generally results in a volatility especially in the case of SIDS. Overreliance on natural resources has been linked to slow economic growth rates, inequality, and poverty due to volatility associated with commodity prices and the underdevelopment of the agricultural and manufacturing sectors. Characteristics common to resource rich countries are as follows: less diversified economies, greater economic volatility, poor social welfare performance, and higher levels of poverty and inequality. Literature surrounding the legitimacy of the natural resource curse in relation to Trinidad and Tobago supports that the oil and gas sector is the main determinant of the country's economic success. Comparatively, following the first two oil booms, its non-energy sector appeared underdeveloped. The entirety of the nation's industrialization has brought an onslaught of concerns surrounding the negative features of economies that are heavily dependent on various forms of revenue that come from its natural resources.

If natural resource abundance is good for economic development, it should then be expected that resource rich countries are developed, experience steady growth rates, and have relatively high standards of living. In contrast, if an abundance of natural resources hinders economic development, then resource rich nations should experience stagnant or volatile growth rates. However, since small island developing states are disproportionately affected by global shifts, if oil and gas prices surge, this surge or inflation of costs leaves these small states in a negative position. They are not as easily able to recover from the economic effects in the same way as nations with equal or less ratios of the same commodity due to their smallness. The comparative analysis in Chapter 5 will show that the relationship between resource rich nations and economic growth is not necessarily negative. The resource curse is not a universal condition nor is it inevitable, but it does affect certain countries with similar conditions over others. A heavy reliance on natural resources may have a negative influence on social wellbeing or inhibit economic growth but this alone does not automatically indicate negative economic or social affects. Whether natural resources are a curse depends on several factors including the strength and quality of its political institutions.

Literature suggests that concepts like rentierism is inevitable in states with a dominant natural resource sector. A rentier state "is one whose economy is based on substantial external revenues that are only generated by a minority of the society, and whose main recipient and distributor is the government of that country" (Ramsamooj 3). States like these reply on substantial external rent and therefore political institutions believe that they do not require a strong domestic productive sector. Only a small population is either involved on employed by the rent generating sector. This is the case in Trinidad and Tobago's energy sector which employs only 5% of the population; citizens do not possess the necessary skills needed to sustain power plants and those alike. As a result, work is outsourced and foreigners are employed. Lastly, the principal recipient of the generation from the rent is the state's government. This becomes an issue depending on the level on the states' corruption and strength of political structures. Lack of political structure and too corrupt states will have a heavier economic effect on underdeveloped or younger economies.

Colonial and post-colonial states engage with global finance in such a way that plays a role in the country's difficulty to assimilate into the global market. Most of the small island developing states, like Trinidad and Tobago, have a long history of colonization. This means that colonial policies are often slow to adjust following a nation's independence. There are certain social stratifications that have rendered certain forms of government that make diversification difficult. Social effects of colonialism influence the population into social strata which do not fit into the modernity of global economies. The economics of profit, GDP, and industry tend to encourage legislation in favor of policies that do not align with social welfare. Policies that favor the growth of oil and gas often neglect the growth of other sectors as well as social welfare. Revenue from oil and gas does not sufficiently trickle into other sectors nor does it encourage social growth. Policies favor subsidizing great deals of industry for more money without properly redistributing it back into other sectors that may improve quality of life, enable a working population, and aid the labor market.

Figure 2. Trinidad and Tobago GDP (1960-2016)
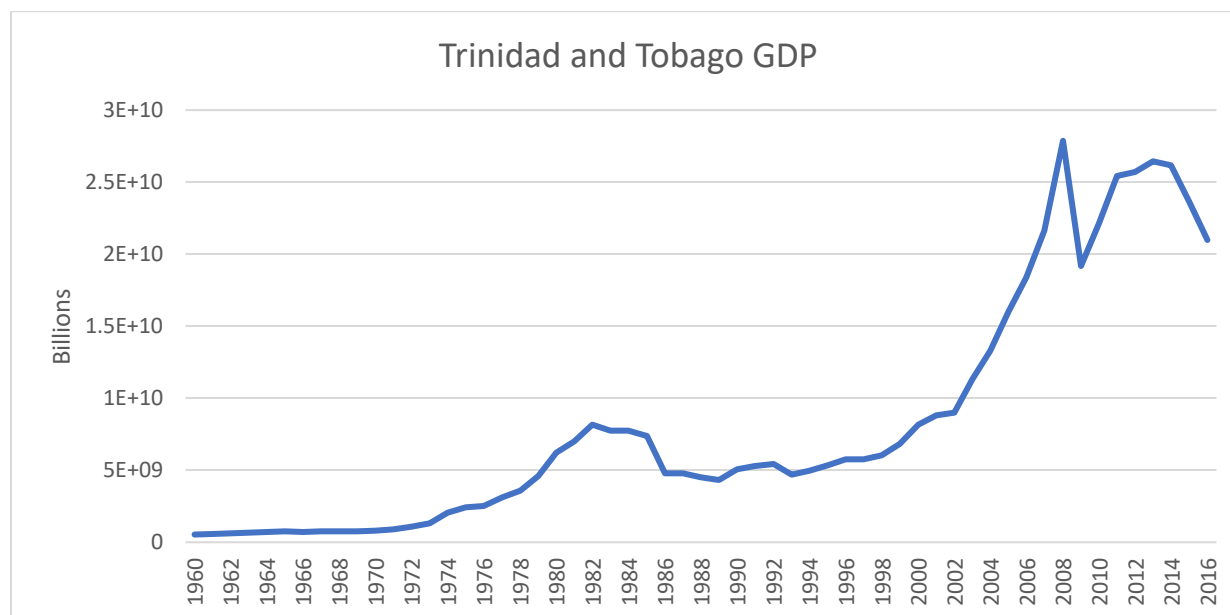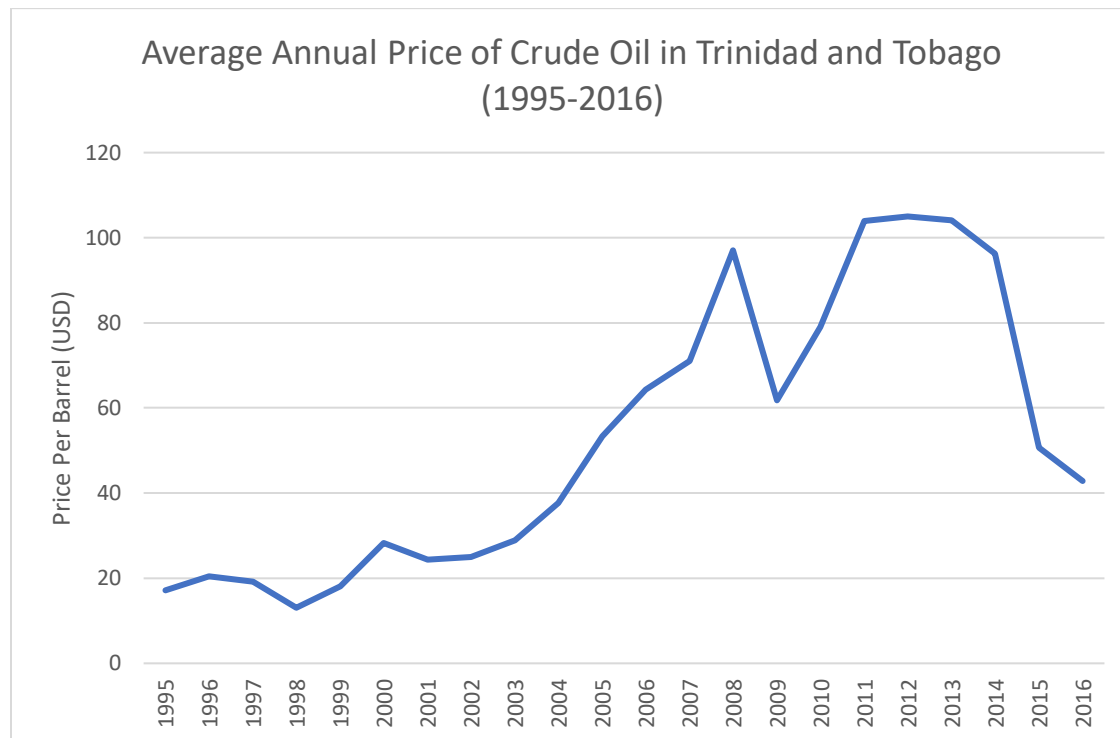

Sources: WorldBank.org

A historical perspective on Trinidad and Tobago's fiscal policies during the oil booms of the 1970s and 1980s will show mismanagement in revenue from oil and gas. This section highlights phases of government policy after Trinidad and Tobago's first two oil booms. The pre-independence and pre-oil boom phase dates from the 1950s to 1973, the oil booms periods are 1973-74 and 1978-79, and the adjustment and post boom periods are 1974-78 and 1979-94. It is difficult to give thorough pre-independence policy analysis due to data limitations. In 1973-74, 1978-79, and 2002-08, Trinidad and Tobago experienced an output increase following three major oil booms. The nation could not, however, sustain this due to poor fiscal policies and mismanagement of wealth. The first two oil booms led to an economic decline that lasted for a decade. Its most recent oil boom came to an abrupt end with the global recession of 2008.

Figure 2 shows Trinidad and Tobago's GDP from 1960-2016. The table above shows Trinidad and Tobago's increasing GDP predating the first oil boom. In 1972, prior to the first oil boom, Trinidad and Tobago's GDP ranged between 5 billion and 9 billion USD. At the beginning of the first oil boom in 1973, there was a steep decrease in the non-energy sector's growth. From 1972 to 1974, growth increased by 23%. From 1973 to 1974, GDP rose from 1.3 billion USD to 2.04 billion. From 1977 to 1978, there was a sharp increase, resulting in 15% growth. From 1978 to 1979 however, there was again, a sharp 7% contraction. From 1978 to 1979, GDP rose from 3.56 billion USD to 4.06 billion USD. During the adjustment period, GDP fell from 8.14 billion

USD to 4.9 USD billion. During the last oil boom, GDP rose from 9 billion USD to 27.87 billion USD in 2008. In 2009 however, GDP had fallen to 19 billion USD and has been erratic since.

The growth rate of the overall GDP in Trinidad and Tobago Is negative over the 1985-1993 period. In 1985, the economy experienced a negative growth rate of 2.5%. This coincides with the fall in oil revenues associated with the fall in oil prices. By 1990, after the implementation of the International Monetary Fund and several structural adjustment programs, growth increased to -1.1% The period between 1995 and 2010 shows substantial growth in GDP. Trinidad and Tobago experienced unprecedented levels of income. By 1994, GDP grew by 5%. The spike between 1994 and 2008 comes as a result of natural gas contribution, which can be seen in Figure 4.

*Figure 3. Average Annual Price of Crude Oil in Trinidad and Tobago (1995-2016)*

Sources: WorldBank.org

Figure 3 shows the annual price of crude oil from 1995 to 2016. The pattern of the annual price of crude oil closely aligns with Trinidad and Tobago's GDP as seen in Figure 2. From approximately 1995 to 2008 there is a spike in both crude oil prices, which is reflected in the nation's GDP. While the figure displays an upwards trend, there are fluctuations in oil prices. As in the case of most oil exporting countries, Trinidad and Tobago produces and exports oil and has

based goods with very specific endowment and little to no substitutes. If sudden appreciations are taken into account, which often occurs in nations with fluctuating oil prices, the development of the non-energy sector becomes a difficult task (Sergeant 19). Artana suggests that "Trinidad and Tobago's problem is not only related to a cyclical phenomenon of a real exchange rate appreciation during oil booms" but that these issues may be more permanent (Artana 31). Figure 4 will further show that exports of oil and oil related products have historically been high, suggesting a diversification issue many natural resource rich countries face.

Figure 4: Trinidad and Tobago Crude Exports by Year (1986-2012)
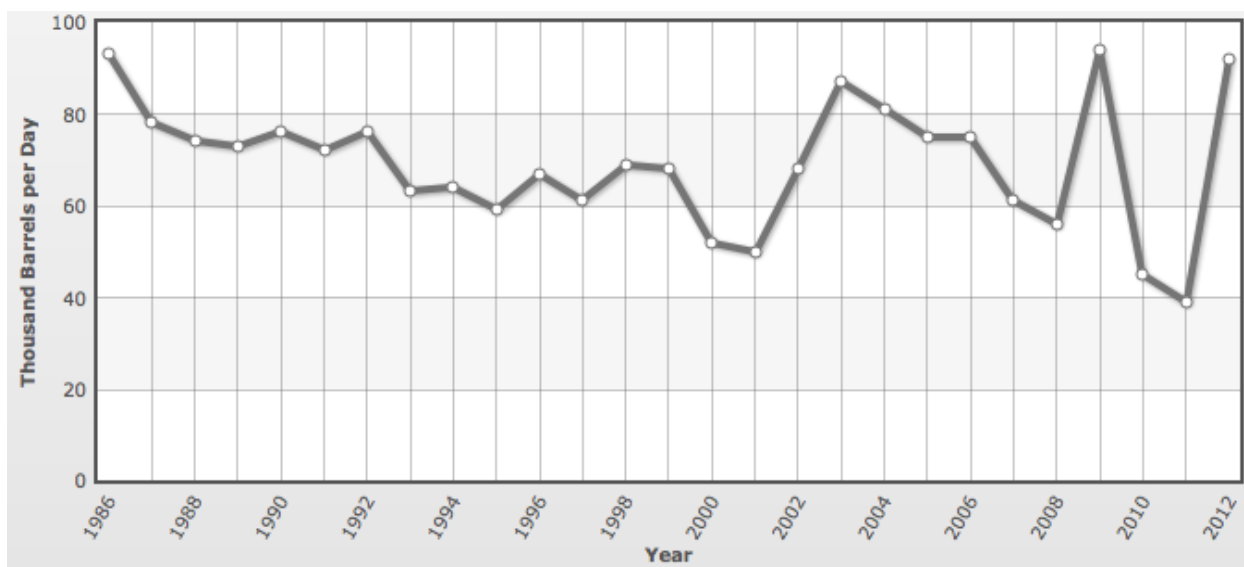
Sources: IndexMundi.com

The figure above highlights Trinidad and Tobago's crude oil exports by thousands of barrels per year between 1986-2012. This figure may be used to analyze the nation's export diversification problems. Historically, oil and oil related products account for 60-70% of the nation's exports. These exports dominate the nation's economy but this dominance has not reduced the country's fluctuations in price of petroleum or natural gas products.

Figure 5. Oil Revenue as Percentage Contribution to GDP

Trinidad and Tobago - Oil revenue
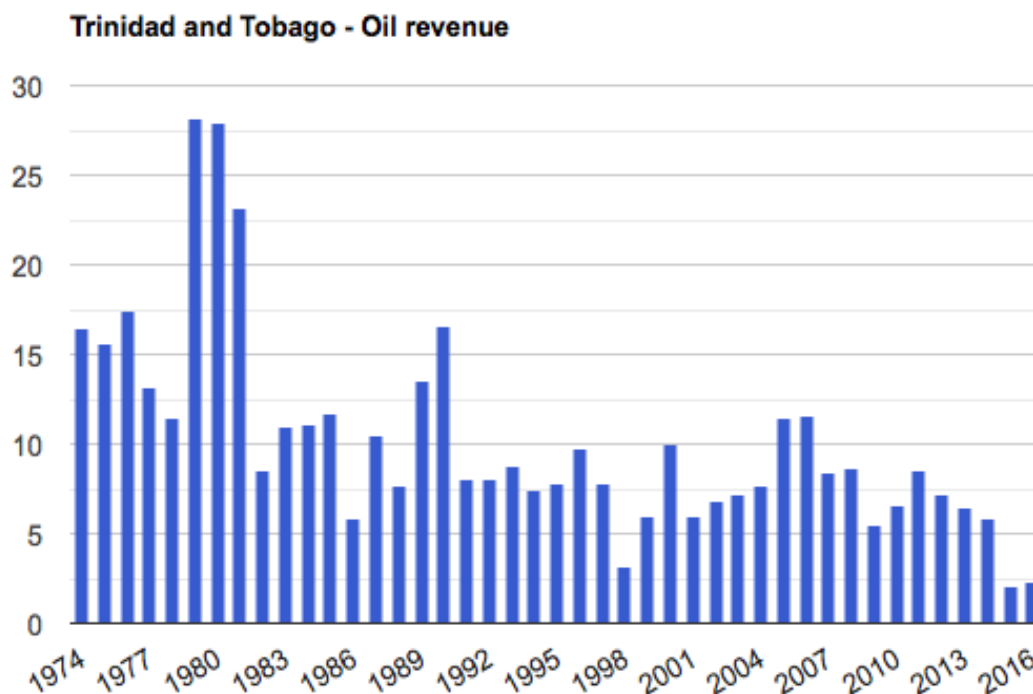
Sources: theglobaleconomy.com

Table 5 shows oil revenue as percetage of GDP. The performance of the petroelum sector is largely influenced by the oil subsector. Prior to 1994, strong performance of the oil subsector translated into strong performance of the entire sector. However, after 1994, with the performance of the gas based sector, the infleucne of the entire energy sector increased, and therefore GDP increased as well.

Figure 6. Natural Gas Monthly Price-US Dollars per Million Metric British Thermal Unit (1989-2018)
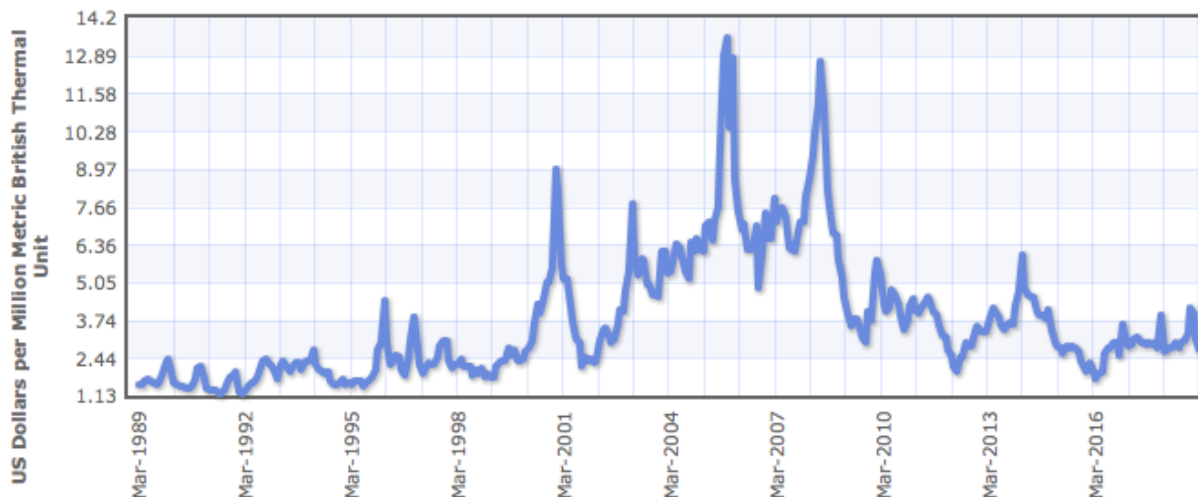
Sources: IndexMundi.com

Graph 6 shows the average monthly price of natural gas from 1989-2018. There is a similar trend in the natural gas price fluctuations as there is in the price fluctuations of crude oil There is a slow increase in the price of natural gas starting in 1995 and it is not until 2000 when there is a drastic increase lasting until approximately 2010.

Figure 7: Natural Gas Exports (1986-2012)
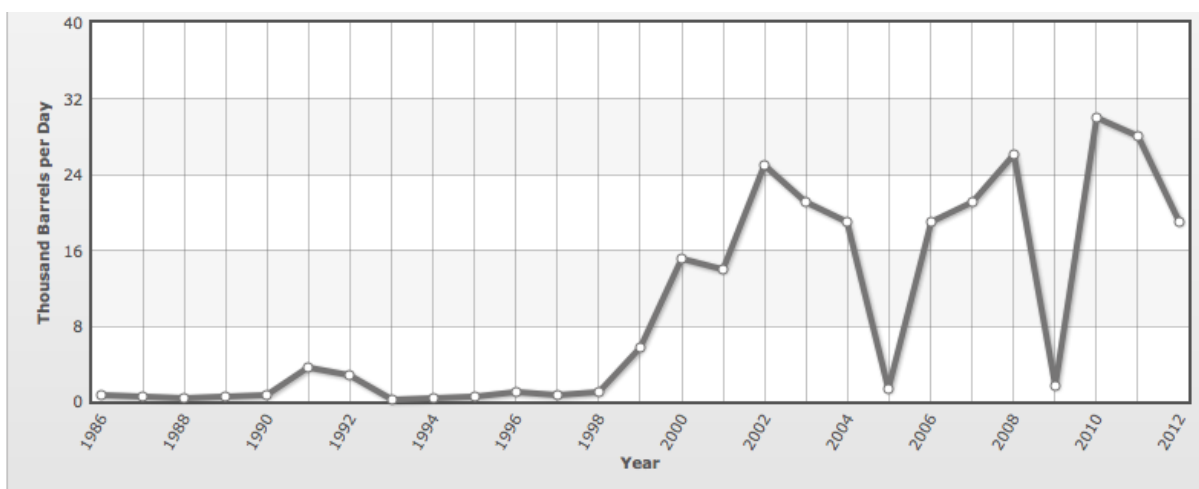
Sources: IndexMundi.com

Figure 7 shows natural gas exports from 1986-2012 by thousands of barrels per day. The 1990-1993 period characterizes the first noticeable increase in natural gas exports. From 1999-

2010, there is not only an increase in natural gas prices as shown in Figure 7 but also a sharp increase in exports. From 1986 to 1998, the amount of natural gas exports is miniscule compared to sharp uptake in exports beginning in 1999. Although exports are volatile after 1999, it is considerably higher than it had been in past years.

Figure 8: Natural Gas Revenue as Percentage Contribution to GDP (1970-2016)
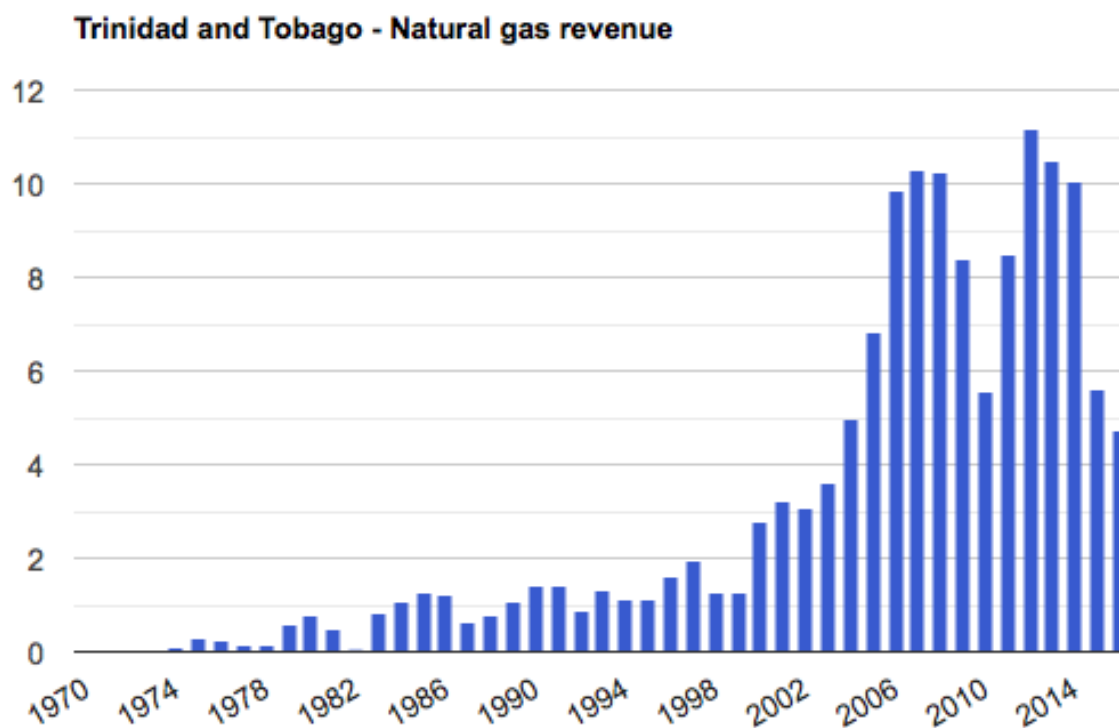
Sources: theglobaleconomy.com

Table 8 shows oil revenue as percetage of GDP. The success of the energy sector was largely depdendent on the oil subsector until 1994 when the gas based petroleum sector began increasing substantially. Prior to 1995, this sector grew by 7.5% annually. From 1994 to 2002, there is a 12% annual increase. 1994-2010 marks a period of substantial revenue from the natural gas sector. This is reflected in high GDP growth during this period as well.

Figure 9: Oil and Natural Gas Contribution to Real GDP

Oil and Natural Gas Contribution to Real GDP
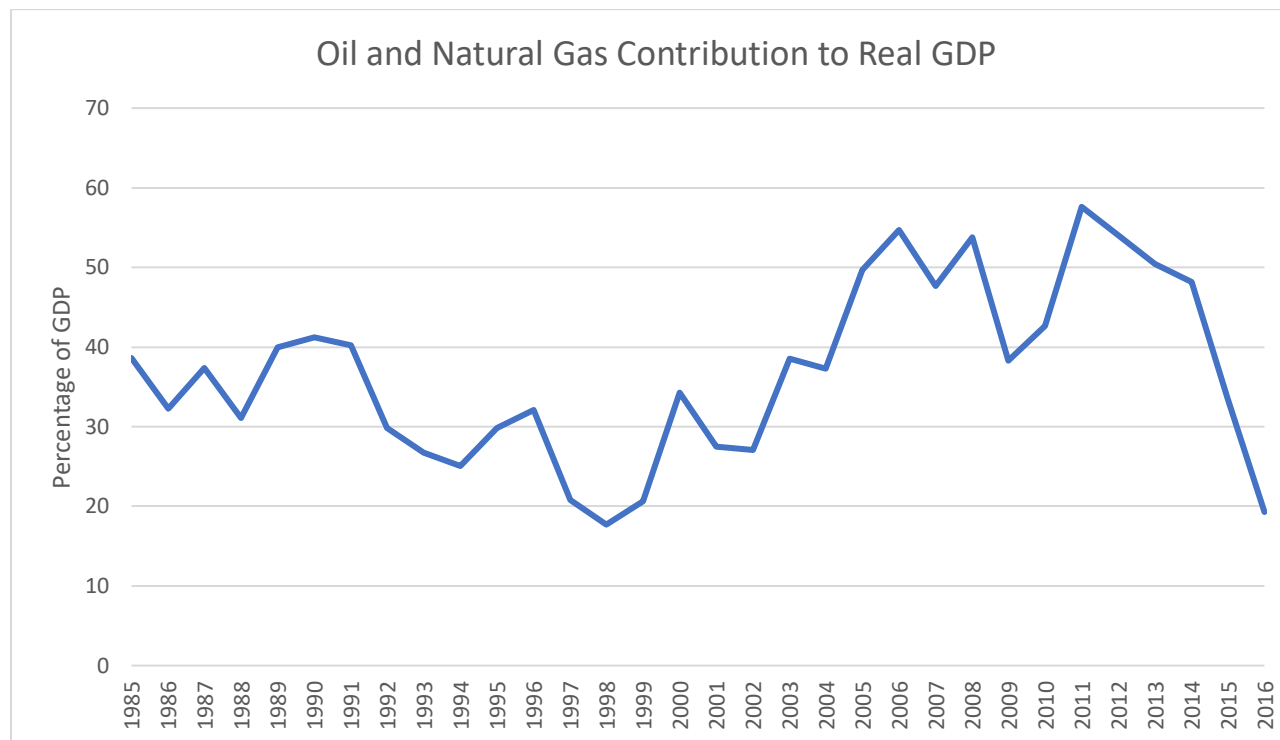
Sources: Ministry of Finance, Central Bank

Figure 9 shows the influence of the oil and gas sector's contribution to Trinidad and Tobago's Real GDP. The energy sector is made up of the sum of the sale and production of petroleum, fuel, natural gas, and ammonia products. The graph above shows that oil and gas revenue as percentage of total government revenue has fluctuated from anywhere between 17% to 57% of GDP over the past three decades. However, the energy sector's median contribution to GDP is approximately 40%. Gas-based petrochemical plants have added to the overall growth in total GDP from the 1994-2010 period.

Chapter 3: What are the economic impacts of legislation? What role do institutions play in Trinidad and Tobago's economic performance?

Velculescu describes that "an overly expansionary and short-term focused fiscal policy and a slow policy adjustment when oil prices dropped after 1982 led to a lengthy and painful recession" (Velculescu 5). These fiscal measures were the first-time Trinidad and Tobago attempted to sustain capital as an independent nation. These policies however were short term resolutions for the new industrialized country. These fiscal policies did not work to diversify the economy, which remains

one of Trinidad and Tobago's long lasting economic problems. Rather, policy makers put more of an emphasis on the energy sector, which narrowed potential revenue sources.

As oil prices remained high during 1974-78 period, the fiscal stance weakened. 1974-78 characterized a period of mass nationalization, a strong push to reduce employment, and government acquirement of forty large corporations including its dominant sugar company. Also at this time, subsidies for food, fuel, and utilities had increased substantially. Subsidies accounted for 6% of non-energy GDP and fiscal subsidies increased to over 18% of oil revenues (Turner-Jones 6). By 1978, the government faced issues dealing with "high recurrent expenditures, investment in declining industries, which diverted revenues into losses, a loss of competitiveness in the non-energy sector…and a steady increase in the of dependence on oil and oil financed expenditures" (Turner-Jones 7). Although the government recognized and planned to reduce its oil and gas reliance, new natural gas finds in 1978 removed the incentive to be cautious.

During the oil booms of the 1970s and 1980s, Trinidad and Tobago experienced various consequences from resource mismanagement. Despite initial steps of caution, political pressures encouraged expenditure that proved harmful to the economy. After the initial influx of capital from oil and gas, policy makers proceeded cautiously, diversifying this revenue across several mediums in an attempt to prevent poor expenditure. 70% of this wealth was saved abroad while the remainder of the windfall had been diversified domestically over several funds. Half of the funds used for investments were allocated towards infrastructure such as transportation, power, and water. The second half of the funds went towards social infrastructure and gas based industrialization (Velculescu 6). The first adjustment period characterized a time in which unemployment rose. To counteract this, subsidies for labor, food, fuel, and utilities were increased.

During the second oil boom in 1979-80, fiscal policies became increasingly expansionary as subsidized consumption and capital investments grew. Public investment policies were mainly geared towards loans and advances for startup companies in the gas based and steel industries. These costs were underestimated and were therefore subsidized consumption was increased to 33% of oil revenues. The second oil boom came directly prior to the global shocks to the price and supply of oil, which had drastic effects worldwide. Luckily, the large reserves acquired in the 1970s helped the economy temporarily weather these shocks throughout the 1980s. The price of oil directly affects the prices of all products made with petroleum, the largest constituent of Trinidad and Tobago's energy sector. Studies have shown that unanticipated shock to oil price

volatility in a small open oil-producing economy such as Trinidad and Tobago incites random swings in the economy. Oil prices not only indirectly affects costs relating to transportation, manufacturing, and heating but may also stifle the growth of the economy as it directly affects the supply and demand of other goods. At this time, fiscal policies were slow to adjust to the quickly falling oil prices in 1982, eventually leading the economy into a lengthily recession. The second oil boom sparked greater expansion and therefore increased inefficiencies. Oil prices have macro level effects on the economy. Velculescu concurs that "a confluence of subsidies, price controls, and wage increases, together with an appreciation of the real exchange rate and an extension of public ownership" have worked to destabilize the non-energy sector rather than enhancing it (Velculescu 6).

The lengthily recession following the second oil boom highlighted many of the key issues facing the fiscal policies adopted thus far. Velculescu explains that "after 1982, unsustainable demands to finance investment, public consumption, subsidies and transfers threatened to eliminate the large international surpluses accumulated since 1973" (Velculescu 7). By 1982, fiscal deficits equaled 77% of oil revenues suggesting a gross mismanagement of funds. Per capita GDP fell by approximately 33% and unemployment rose from 10% to 19% (Velculescu 7). Policy response was slow to adjust because policymakers believed the shock was temporary. The recession would last for seven years following the second oil boom.

Harripaul explores which capital inflows have altered the macroeconomic performance in Trinidad and Tobago after its oil booms. The author offers specific markers of macroeconomic instability caused by an influx of capital into the economy. He explains that this inflow causes "acceleration in domestic demand, a deterioration in the external current account, and pressures on the prices of goods, real estate and financial assets (Harripaul, 1). To examine the macroeconomic impacts of capital inflows, Harripaul employs the Block-Recursive Simultaneous Equation System Model. Harripaul concludes that capital inflow has no obvious effect on investment and is inversely related to consumption. Data also shows that capital inflows also have a positive effect on employment and interest rates. Capital inflow, however, is inversely related to consumption and has no clear effect on the real exchange rate (Harripaul, 1).

Economists take issues with the following financial and monetary policy measures taken between 1982-88. The following are a part of policy framing documents in the natural gas sector aimed at sector diversification:

    a. "The cash reserve equipment of non-bank financial institutions was increased by 5%.

    b. In 1984, the statutory reserve requirement that commercial banks were required to hold was increased o 17% of their deposit utilities from a requirement of 9% and marginal reserves of 15% of any increase. Other adjustments to this instrument were made in 1986-87 – in the latter year through a directive from the Central Bank that resulted in an increase in the reserve requirement.

    c. Restriction of credit to state enterprises in 1988.

    d. Increase of rediscount rate in 1983 and 1988.

    e. Maintenance of positive real interest rates from 1984.

    f. Financial support of arrangement between Central Bank and commercial banks because of tight liquidity conditions.

    g. Modification for selective credit controls relative to consumer loans

    h. Greater transparency through introduction of financial reforms – Companies Act, the Insurance Act, Bank Act. Etc. – to increase competitiveness, capitalization, regulation and institutional capability."

Sources: Compiled by P. Harrison

Despite the temporary remedy of the oil reserved discovered in the 1970s, the following effects in the 1980s showed an increase in macroeconomic difficulties. The end of two oil booms left Trinidad and Tobago with fiscal and external deficits. The adjustment period, the 1980s saw the start of economic restructuring. The adjustment program began in 1988-89 when the government officially started making reforms to the nation's fiscal policies in response to the effects of its oil booms. On January 25, 1989, Trinidad and Tobago sought economic relief from the International Monetary Fund and the World Bank. Then on April 27, 1990, the nation was supported by a Structural Adjustment Loan. The main adjustment policies are as follows:

    a. "Reduction of exchange controls on visible trade items

    b. Tax reform including the reduction of both personal and income-tax

    c. Liberalization of the tac regime – dismantling of negative list by removal of 40% of items in 1988 which were subjected to import prohibition

    d. Contractionary monetary policy through reduced growth rate of money supply, particularly in 1988, rediscount of credit to state enterprises, increase of rediscount rate in 1983 and 1988

    e. Maintenance of positive real lending interest rates from 1984

    f. Further devaluation of the exchange rate by 35% and managed floating in 1993."

Sources: Compiled by P. Harrison

The Structural Adjustment Loan supported the government's structural adjustment by addressing the key policies essential to growth as depicted above. The program increased the "efficiency of public sector management, removed the allocative inefficiencies produced by the prevailing restrictive trade regime, and provided the social underpinning for the sustainability of the adjustment process" (WorldBank.org). The loan focused mainly on the nation's reform

program aimed at "public sector resource mobilization and allocation which included state enterprise restructuring and divestiture, efficiency improvements and tariff improvements and tariff increases in public utilities" (WorldBank.org). The loan also focused on the management of public sector investment. This was accomplished by improving trade and investment incentives. The Structural Loan Program also assisted in strengthening the nation's social sector policies and programs.

Chapter 4: Effects of oil and gas dominance on Trinidad and Tobago's economy

The effects of oil and gas dominance on Trinidad and Tobago's economy can be observed through various indicators. Fluctuations in debt to GDP ratio, government expenditure, inflation, and employment rates can be seen during the nation's oil booms and throughout its adjustment periods.

*Figure 10. Debt to GDP Ratio (1970-2010)*
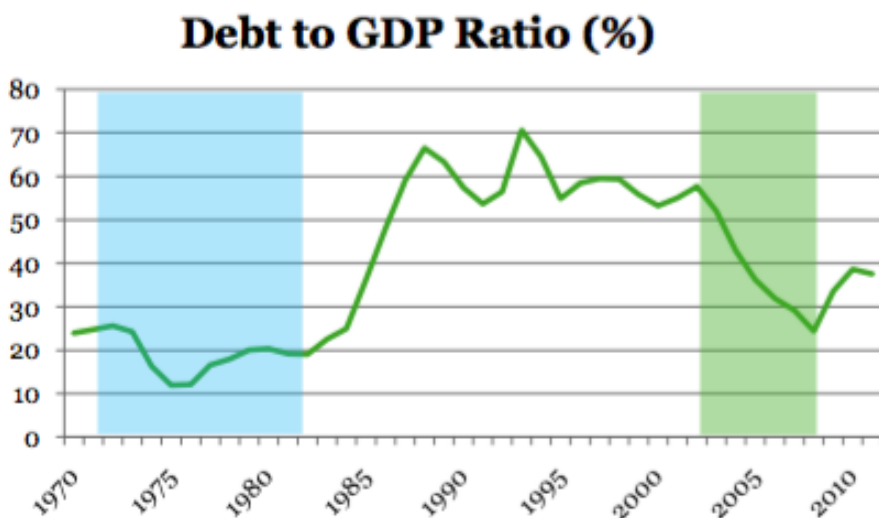
Sources: Ministry of Finance

Figure 10 shows Trinidad and Tobago's Debt to GDP Ratio from 1970-2010. A lower debt to GDP ratio suggest that the economy produces and sells goods and services at a rate sufficient to repay debts without incurring further debt. The lower debt to GDP ratio in the nation's earlier years, suggests that policymakers were cautious with funds following the nation's first oil boom. When the second oil boom occurred, the debt to GDP rose gradually until a noticeable spike in 1985. 1985-1990 characterizes the second adjustment period. Fiscal policies appeared to adjust

more quickly following the second oil boom. This may suggest that some measures were taken to avoid some of the volatility experienced in the wake of the initial oil boom but were ineffective shortly thereafter.

There is a direct correlation between government spending and income from oil and gas. Starting in 1995, in which there is a sharp increase in GDP, there is also an increase in the debt to GDP ratio indicating that policymakers are increasing expenditure.

Figure 11. Expenditure Categories as Percentage of Nonenergy GDP In Percentage of GDP (1973-2003)
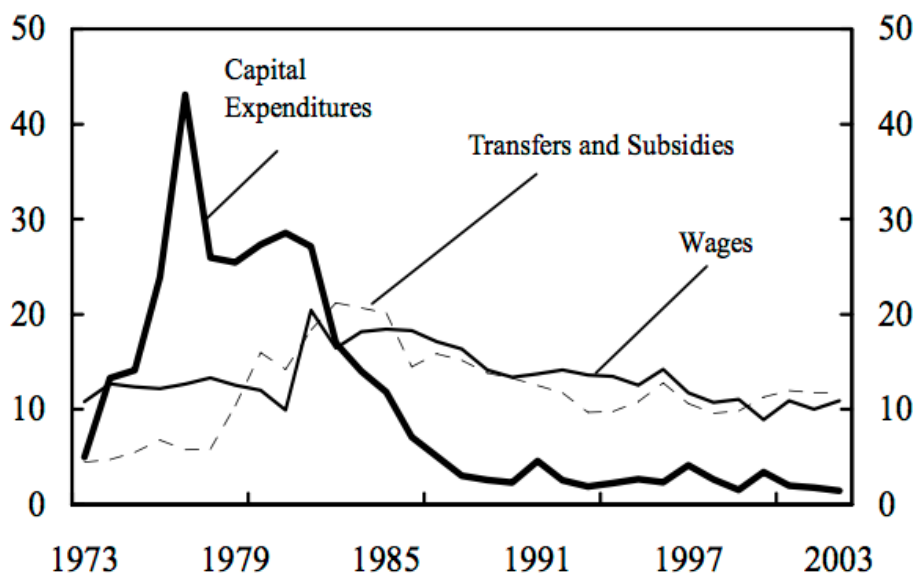

Sources: Compiled by D. Velculescu

Figure 11 shows capital expenditures, wages, and transfers and subsidies as a percentage of GDP from the start of the first oil boom to the start of the current oil boom. The first oil boom came in 1973-74. At this time, the government's capital spending increased from approximately 4.5% to 14%. From approximately 1977 to 1978, the government's expenditures hit an all-time high as a result of the beginning of the second oil boom. The capital expenditure rose from to between 1977 and 1978. During the adjustment period, 1982-94, capital expenditures the second oil boom did not mimic the first in terms of government expenditures. During the adjustment period, government expenditures began to steadily decline. It wasn't until around 1986 when a steady level of expenditure was resumed. Also in this graph is the wages that also fluctuate

alongside capital spending. From 1973 to approximately 1983, wage expenditures were lower in comparison to capital expenditures. It wasn't until the adjustment period when the opposite change occurred. By this time, wage expenditures were higher than capital expenditures. While the fluctuation of wages is not perfectly aligned with pattern of the capital expenditures, it is possible that the policy changes made in the adjustment period may have led to greater wage expenditures.

Figure 12. Unemployment vs. Inflation Rate (1970-2008)

Unemployment vs. Inflation Rate 1970-2008
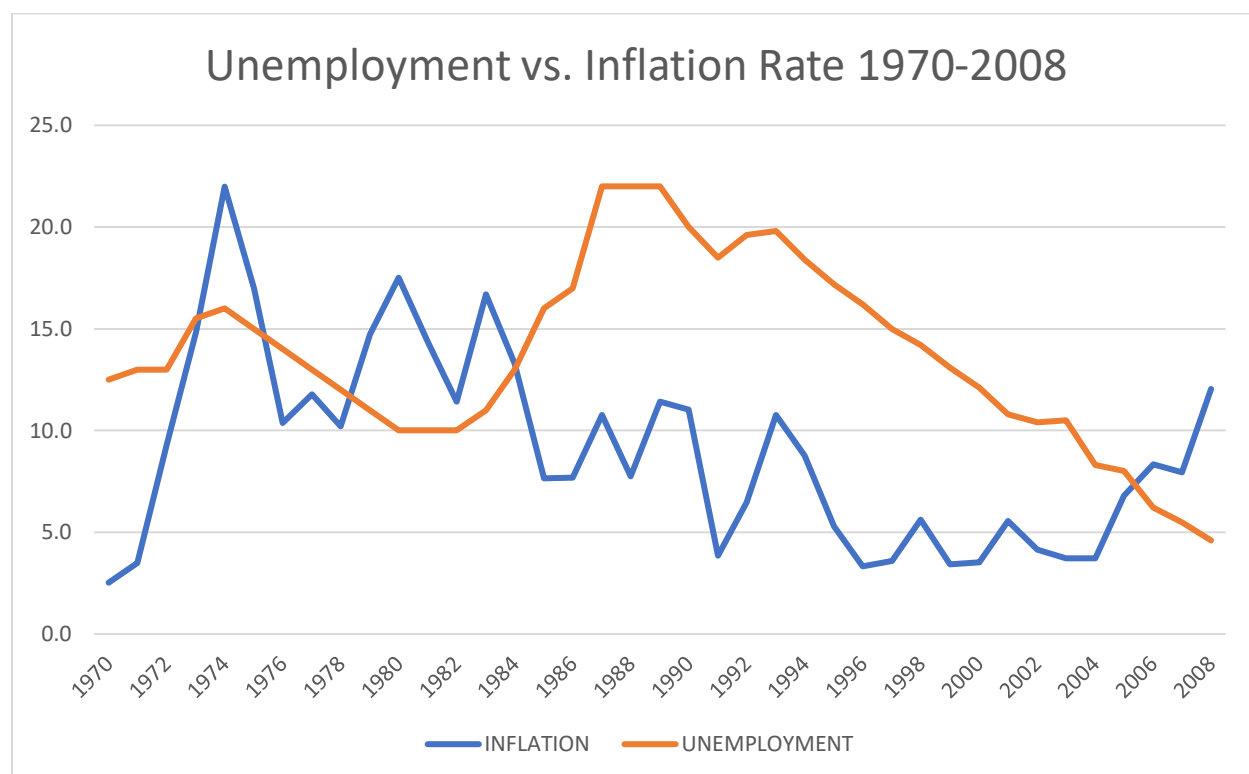
Sources: WorldBank.org

Figure 12 shows the relationship between the nation's unemployment and inflation rate. Prior to the first oil boom, the unemployment rate fluctuated between 11% and 13%. Between 1973-74, the unemployment rate had risen slightly more than it was prior to the boom. In 1978-79, the unemployment rate decreases from approximately 12% to 11%. Workers migrated from the agriculture sector towards the energy sector at the time of the oil boom. This in turn causes the inverse relationship between inflation and unemployment. As inflation rises, the unemployment rate decreases and vice versa. Inflation rises because wages are rising. Wages rise because unemployment is decreasing. Wages are rising because the government is seeking specialized

talent within the energy sector. However, despite being unqualified for work in the energy sector, most citizens moved away from the agricultural sector.

The oils booms lead to two major effects including the spending effect and the resource movement effect. The spending effect comes as a result of increased revenue from the oil and gas sectors. There is increased demand for non-tradable goods and services. Demand for labor increases in the non-tradable sector which leads to a price increase in non-tradable goods. Labor migrates from the non-energy sector to the energy sector, which has historically constituted less than 5% of employment for the past three decades. The resource movement effect incites increased demand for labor in the oil and gas sectors during each oil boom. Wages increase in the energy sector, inciting labor migration. This effect is insignificant because the energy sector account for a miniscule share in total employment.

Figure 13. Employment in Oil and Petrochemicals (1985-2002)

EMPLOYMENT IN OIL AND PETROCHEMICALS

Year	Total Employment-persons	Percentage Employed in the oil and gas-based sector[5]
1985	400,200	2.5
1986	389,400	2.7
1987	372,800	3.0
1988	371,600	3.5
1989	365,700	3.7
1990	374,100	4.5
1991	401,100	4.6
1992	405,900	3.8
1993	404,600	3.7
1994	415,500	3.8
1995	431,600	3.9
1996	444,200	3.8
1997	459,900	3.6
1998	479,300	3.7
1999	489,400	3.2
2000	503,100	3.2
2001	514,100	3.2
2002	525,100	3.4

**Sources:** Compiled by K. Sergeant, S. Racha, and M. John

Historically, the oil and petroleum sector has only accounted for a maximum of 5% of total employment. The table reveals that the average employment in the oil and gas-based sector is approximately 3.5% of people employed in a given year. Most projects in the energy sector are

capital intensive which means that permanent employment in this sector is rare. The construction of the average oil and gas plant employs approximately 3,000 people within a span of two years. Upon completion, operations only require about 75 to 100 employees per plant. The government employees 4,000 people on a permanent basis and 2,000 on a temporary and contractual basis. Therefore, while the oil and gas sector may be the dominant contributor to the nation's GDP, it is not a major contributor to the nation's employment.

Chapter 5: Comparative Data Analysis

In this chapter, I will examine Trinidad and Tobago through several indicators that test the quality of institutional strength and citizens' well-being. The data presented in this section is entirely gathered from the World Bank and the Heritage Foundation. All economic freedom indexes are obtained from the Heritage Foundation. The Heritage Foundation measures economic freedom based on twelve quantitative and qualitative factors grouped into the following categories: rule of law, government size, regulatory efficiency, and open markets (Heritage.org). This section will address at least one aspect of each: property rights, government integrity, government expenditure, business freedom, and trade freedom. The Heritage Foundation scores these categories on a scale of 0 to 100, with 100 being the best.

Figure 14. Average GDP Per Capita (1995-2016)

Average GDP Per Capita (1995-2016)
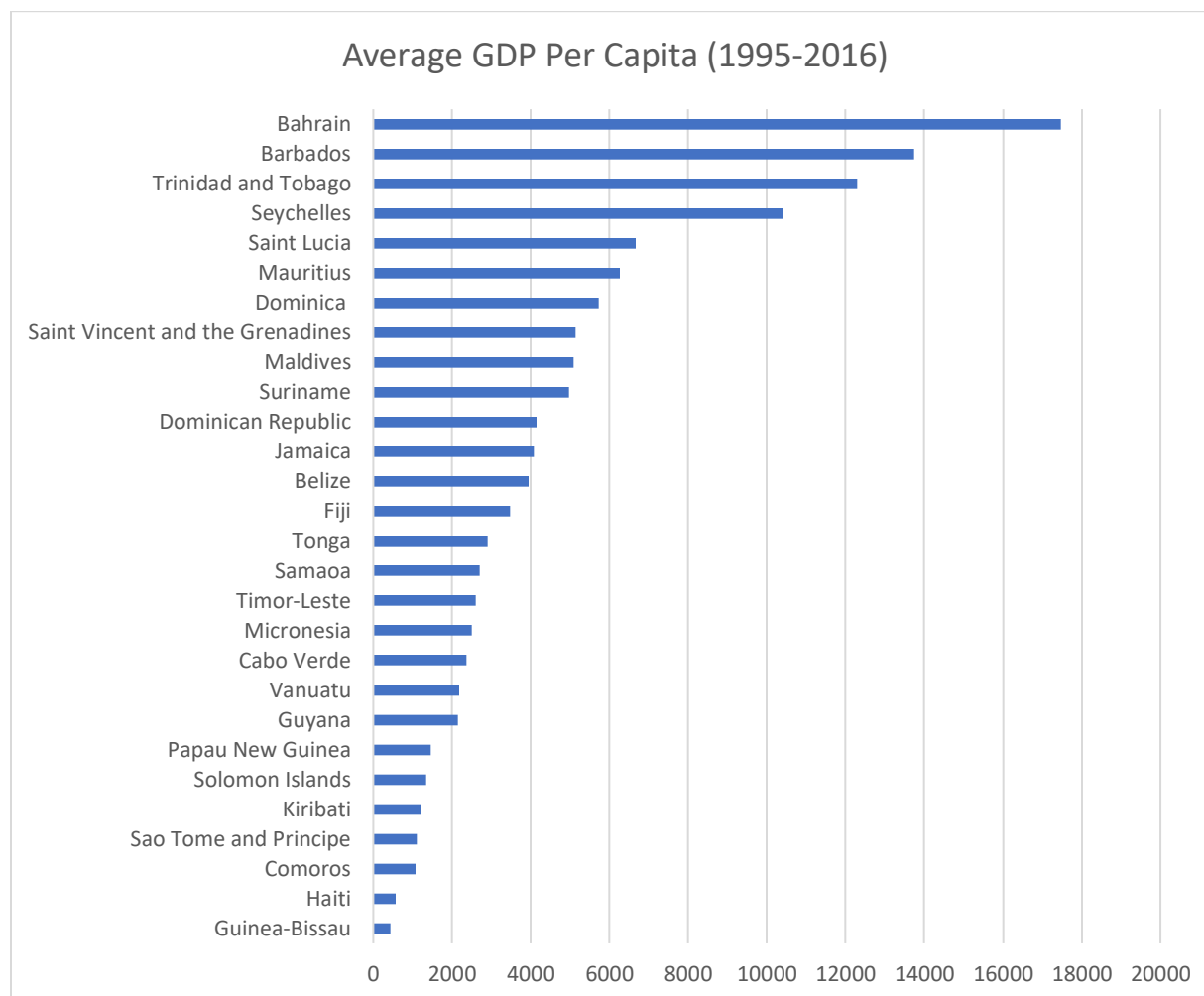
Sources: WorldBank.org

Bahrain, Barbados, and Trinidad and Tobago, and Seychelles have the highest GDP per capita at 17466.77 USD, 13743.49 USD, 12297.38 USD, and 10396.94 USD respectively. These four countries are outliers considering their GDPs are significantly higher than that of other small island developing states. Comoros, Haiti, and Guinea-Bissau have the lowest GDP per capita at 1080.43 USD, 561.72 USD, and 431.26 USD. The median GDP per capita is approximately 2710 USD, which belongs to Samoa.

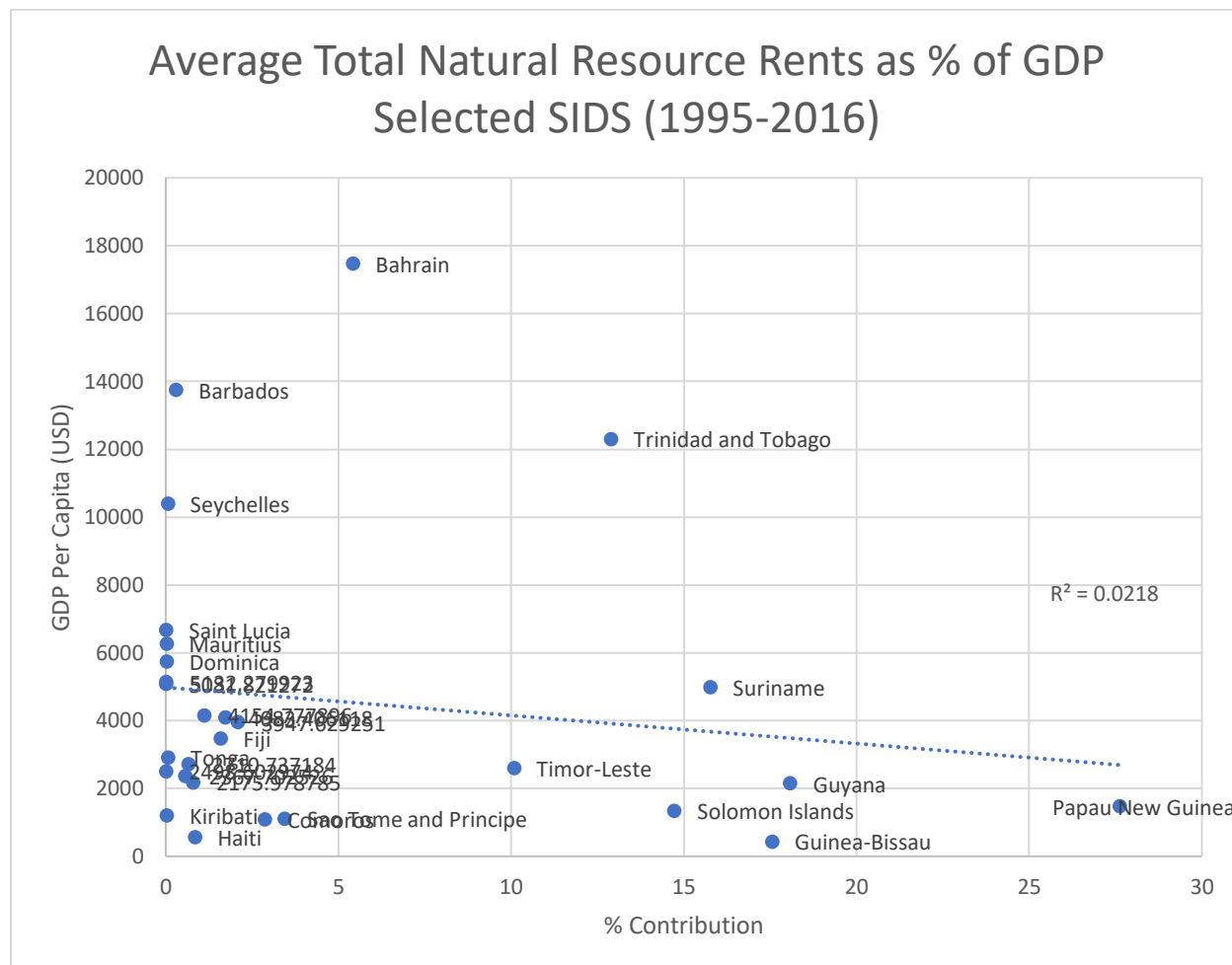*Figure 15. Average Total Natural Resource Rents as % of GDP 47 SIDS (1995-2016)*
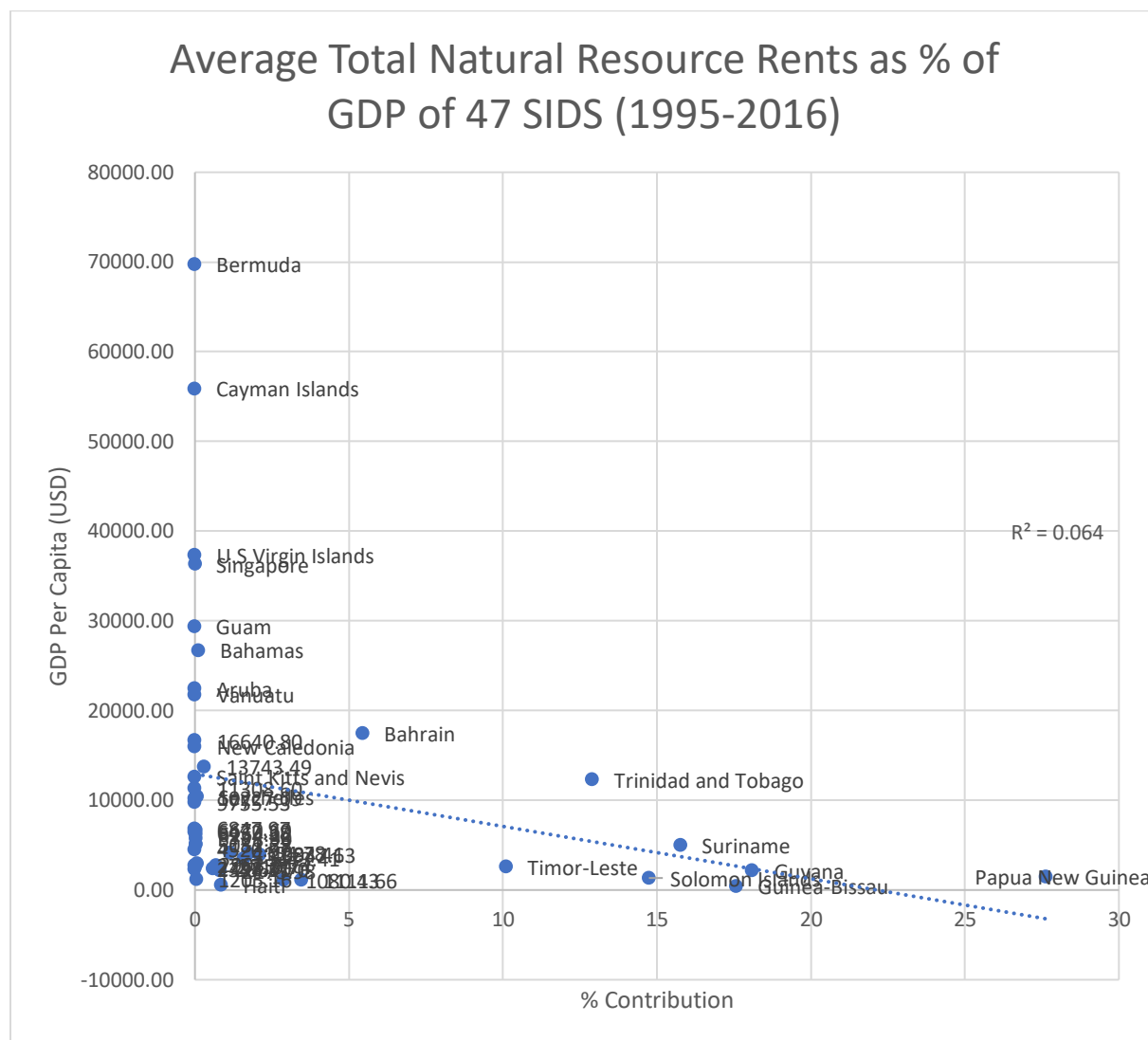
Sources: WorldBank.org

Figure 15 shows the average total natural resources contribution as percentage of GDP from 1995-2016 for 47 small island developing states. These 47 states are chosen based on accurate data availability. The total natural resource rents are the "sum of oil rents, natural gas rents, coal rents, mineral rents, and forest rents" (WorldBank.org). R square explains the proportion of variance explained by the fit. The R square value may be negative for equations that do not contain a constant term. The R square may also be negative if the fit is worse than fitting a horizontal line. All R square values in this study are positive. The R Square of the average total natural resource rents as percentage of GDP of 47 SIDS equals 0.06395, which signifies that 6.4% of the variation in the data can be explained by the independent variable. While there is no significant correlation

between natural resource rent contribution to GDP and GDP per capita, the R square supports the theory of the natural resource curse for 6.4% of SIDS test for.

*Figure 16. Average Total Natural Resource Rents as % of GDP Selected SIDS (1995-2016)*

Average Total Natural Resource Rents as % of GDP Selected SIDS (1995-2016)

Sources: WorldBank.org

Figure 16 shows the average total natural resources contribution as percentage of GDP for the selected 28 small island developing states. The graph indicates that Papua New Guinea holds the highest average contribution at 27.62%, followed by Guyana, Guinea Bissau, Suriname, the Solomon Islands, and Trinidad and Tobago. Trinidad and Tobago stands at a 12.9% contribution. Saint Vincent and the Grenadines holds the smallest contribution to GDP at 0.025%. The median level of the average total natural resource contribution is 2.11%.

The correlation above shows an insignificant relationship between GDP per capita and average natural resource contribution to GDP. Based on this data however, one may concur that

there is a negative correlation between countries with a higher GDP per capita and those with a higher average percentage of resource contribution to GDP. The R Square equals 0.022, which signifies that only 2.2% of the variation in the data can be explained by the independent variables. There is even less of a correlation in this data set than there is in the larger data set from Figure 15. Regardless, average total natural resource rents as percentage of GDP and GDP per capita have the weakest and therefore most insignificant correlation.

*Figure 17. Average Property Rights Score (1995-2016)*
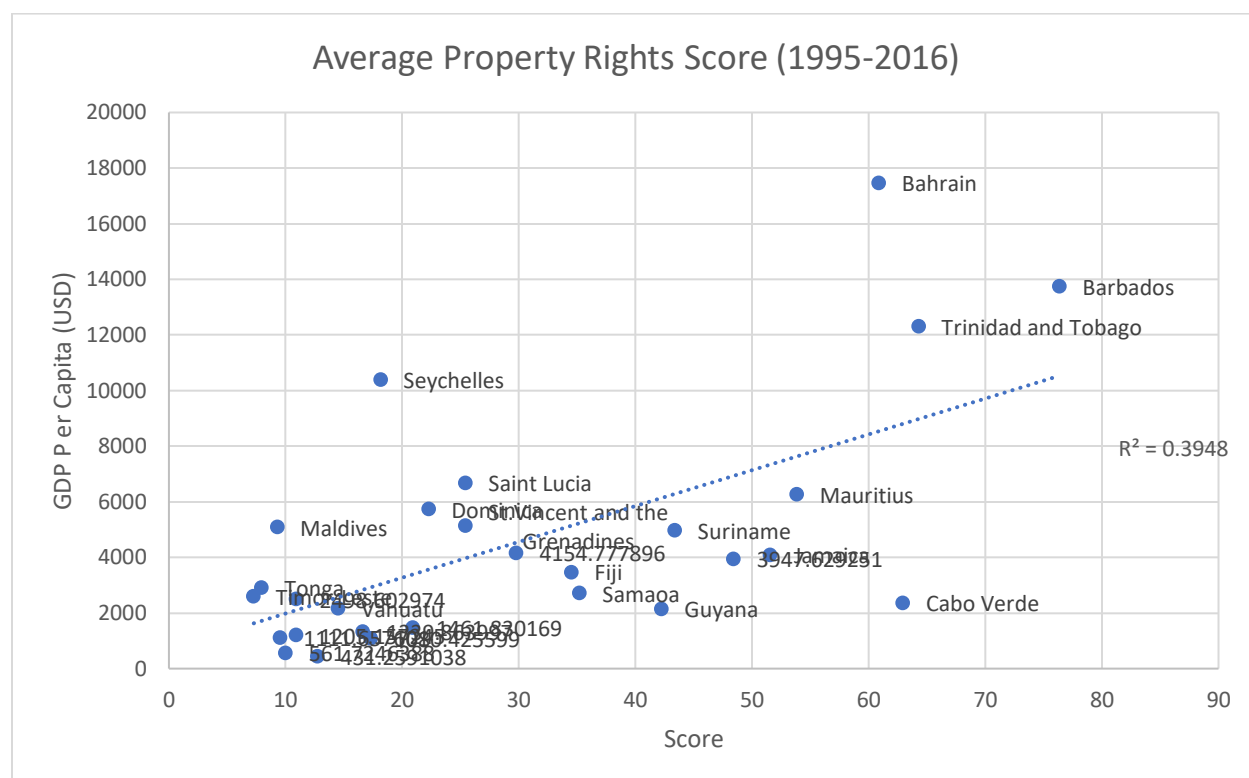
Sources: Heritage.org, WorldBank.org

The property rights component reflects to what extent a nation's government allows citizens to acquire, hold, and utilize private property under a clearly expressed legal framework. This is determined equally weighting the following subcategories: "physical property rights, intellectual property rights, strength of investor protection, risk of expropriation, and quality of land administration" (Heritage.org). The top three nations with the highest average property rights scores are: Barbados, Trinidad and Tobago, and Cabo Verde, with scores of 76.36, 64.32, and 62.95 respectively. Countries that score between 50 and 60 are considered to be mostly unfree. Countries that score 61 and greater are considered moderately free. The average GDP per capita

for these countries are: 13743.49 USD, 12297.38 USD, and 2367.7 USD. Despite having a high property rights score, Cabo Verde has a significantly lower average GDP per capita when compared to countries with a similar property rights score. Timor-Leste, Tonga, and the Maldives have the lowest property rights score at 7.27, 7.95, and 9.32 respectively. As per the scales found on Heritage.org, these scores suggest severe repression in terms of property rights. These GDP per capita of these countries are: 2604.81 USD, 2903.94 USD, and 5081.82 USD respectively. Approximately 80% of these nations have property rights scores that would indicate their repression.

The R Square for the data is 0.39477, which indicates that 39.48% of the data can be explained by the model. This describes a weaker positive relationship between a higher average property rights score and a higher GDP per capita. This suggests that 39.48% of this data supports the claims of the natural resource curse.

Figure 18. Average Government Integrity Score (1995-2016)
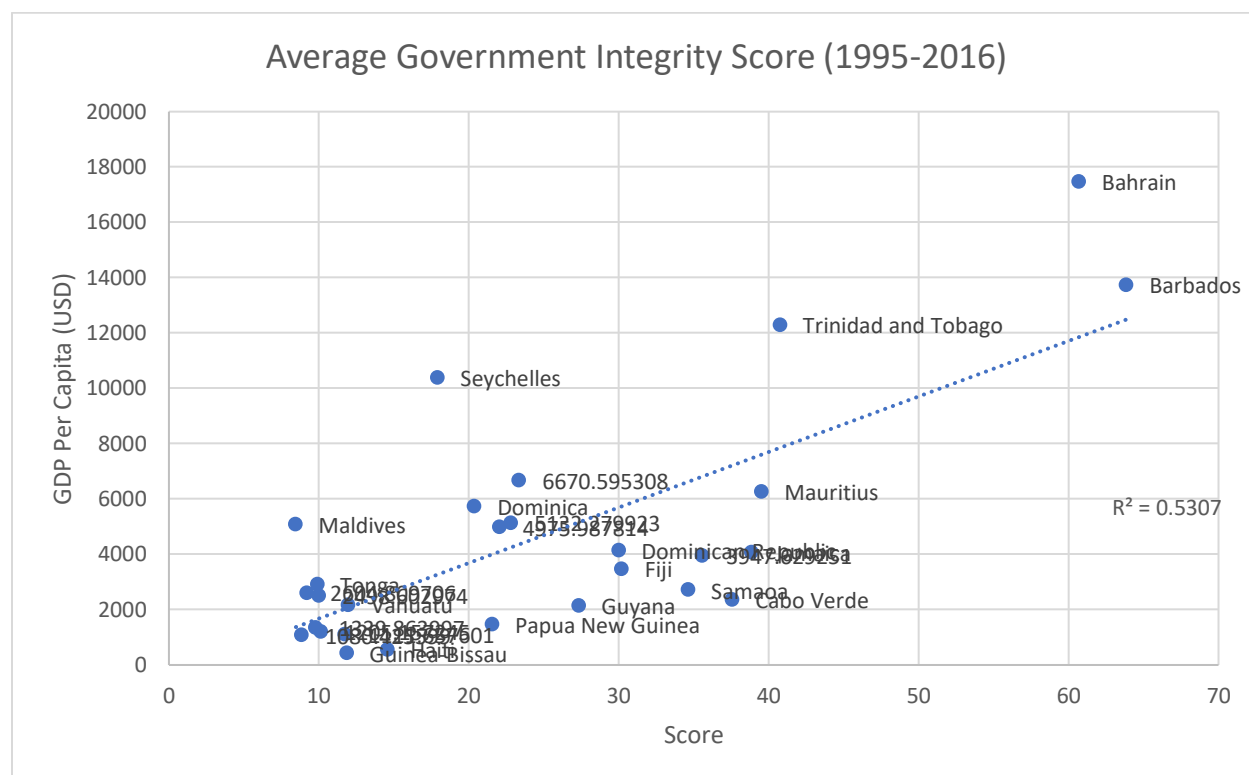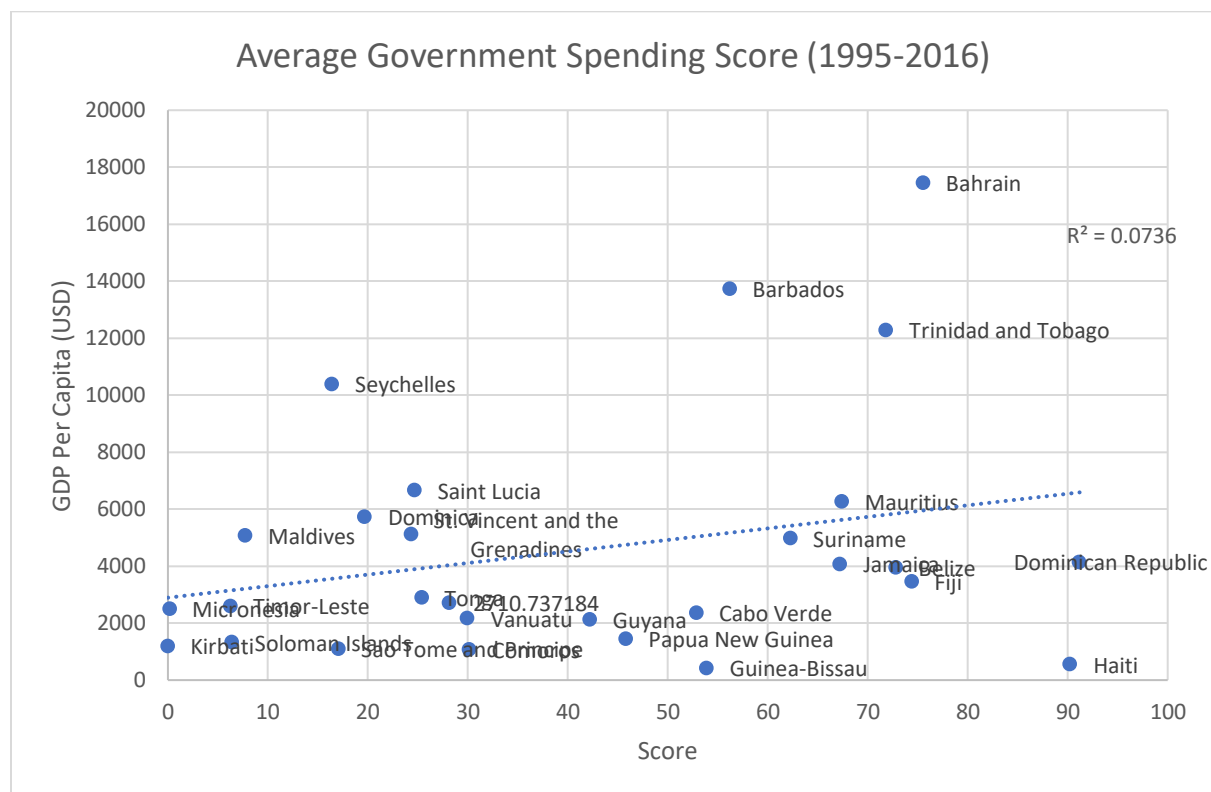

Sources: Heritage.org, WorldBank.org

Figure 18 shows the average government integrity score between 1995 and 2016 of the selected 28 countries. Government integrity is calculated based on averaging the following factors:

"public trust in politicians, irregular payments and bribes, transparency of government policymaking, absence of corruption, perceptions of corruption and governmental and civil service transparency" (Heritage.org). The top three nations with the highest government integrity scores also have the highest GDP per capita. Barbados has a score of 63.86, Bahrain has a score of 60.7, and Trinidad and Tobago has a score of 40.77. Countries that score between 60 and 70 are moderately free. Their average GDP per capita are 13743.49 USD, 17466.77 USD, and 122997.38 USD respectively. The Maldives, Comoros, and Timor-Leste have the lowest government integrity scores at 8.46, 8.87, and 9.2 respectively. Their GDP per capita are as follows: 5081.82 USD, 1080.43 USD, and 2604.81 USD respectively. With the exceptions of Barbados and Bahrain, all of the other nations have government integrity scores that indicate that their governments are highly corrupt.

The R Square for the data set is 0.53071, which indicates that 53.07% of the data can be explained by the model. This data reveals a moderate positive relationship between a higher average government integrity score and average GDP per capita. 53.07% of this data supports the claims of the natural resource curse.

*Figure 19: Average Government Spending Score (1995-2016)*

Sources: Heritage.org, WorldBank.org

The figure above shows average government spending score between 1995-2016 of the small island developing states. Government spending reflects "consumption by the state and all transfer payments related to various entitlement programs" (Heritage.org). The Dominican Republic, Haiti, and Bahrain have the top government spending scores at 91.19, 90.21, and 75.53 respectively. Countries that score greater than 80 are free; the Dominican Republic and Haiti are outliers in this data set. Bahrain is moderately free. Their average GDP per capita are as follows: 4154.8 USD, 561.72 USD, and 17466.77 USD respectively. Kiribati, Micronesia, and Timor-Leste have the lowest reported average government spending scores: 0, 0.18, and 6.27. These three countries are also outliers in this data set. Their average GDP per capita are as follows: 1205.16 USD, 2498.91 USD, and 2604.81 USD respectively. The 28 countries are evenly distributed in terms of freedom levels.

The R Square for the data is 0.0736, which indicates that 7.36% of the data can be explained by the model. There is a minute relationship between the independent and dependent variables. Only 7.36% of this data supports the claims of the natural resource curse.

*Figure 20: Average Business Freedom Score (1995-2016)*
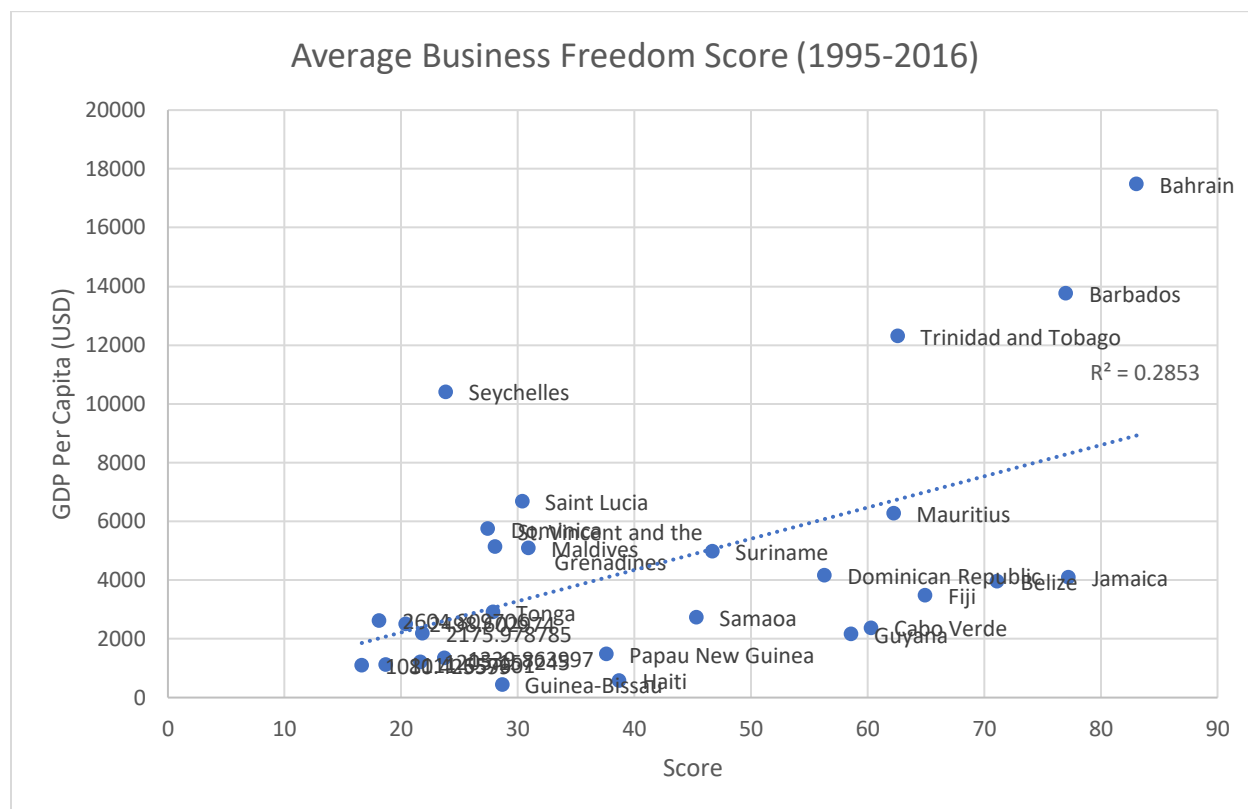
Sources: Heritage.org, WorldBank.org

Figure 20 shows the average business freedom scores of the selected countries. The business freedom index measures "the extent to which the regulatory and infrastructure environments constrain the efficient operation of businesses" (Heritage.org). The quantitative score is derived from an array of factors influencing the difficulty of starting, maintaining, and closing a business. Most of these countries have a score that would indicate repression. Bahrain, Jamaica, and Barbados have the highest business freedom scores of the set. Bahrain has a score of 83.08 with a GDP per capita of 17466.77 USD, Jamaica has a score of 77.22 and a GDP per capita of 4083.41 USD, and Barbados has a score of 77.02 and GDP per capita of 13743.93 USD. Comoros, Timor-Leste, and Sao Tome and Principe have the lowest average business freedom scores as 16.62, 18.11, and 18.67 respectively. Their average GDP per capita are as follows: 1080.43 USD, 2604.81 USD, and 1111.66 USD respectively. The data set suggests that approximately 80% of these countries are mostly unfree in terms of business freedom.

The R Square for the data is 0.28528, which indicates that 28.53% of the data can be explained by the model. This reveals a weak positive relationship between a higher average

business freedom score and GDP per capita. 28.53% of this data supports the claims of the natural resource curse.

Figure 21: Average Trade Freedom Score (1995-2016)

Average Trade Freedom Score (1995-2016)

$R^2 = 0.1014$
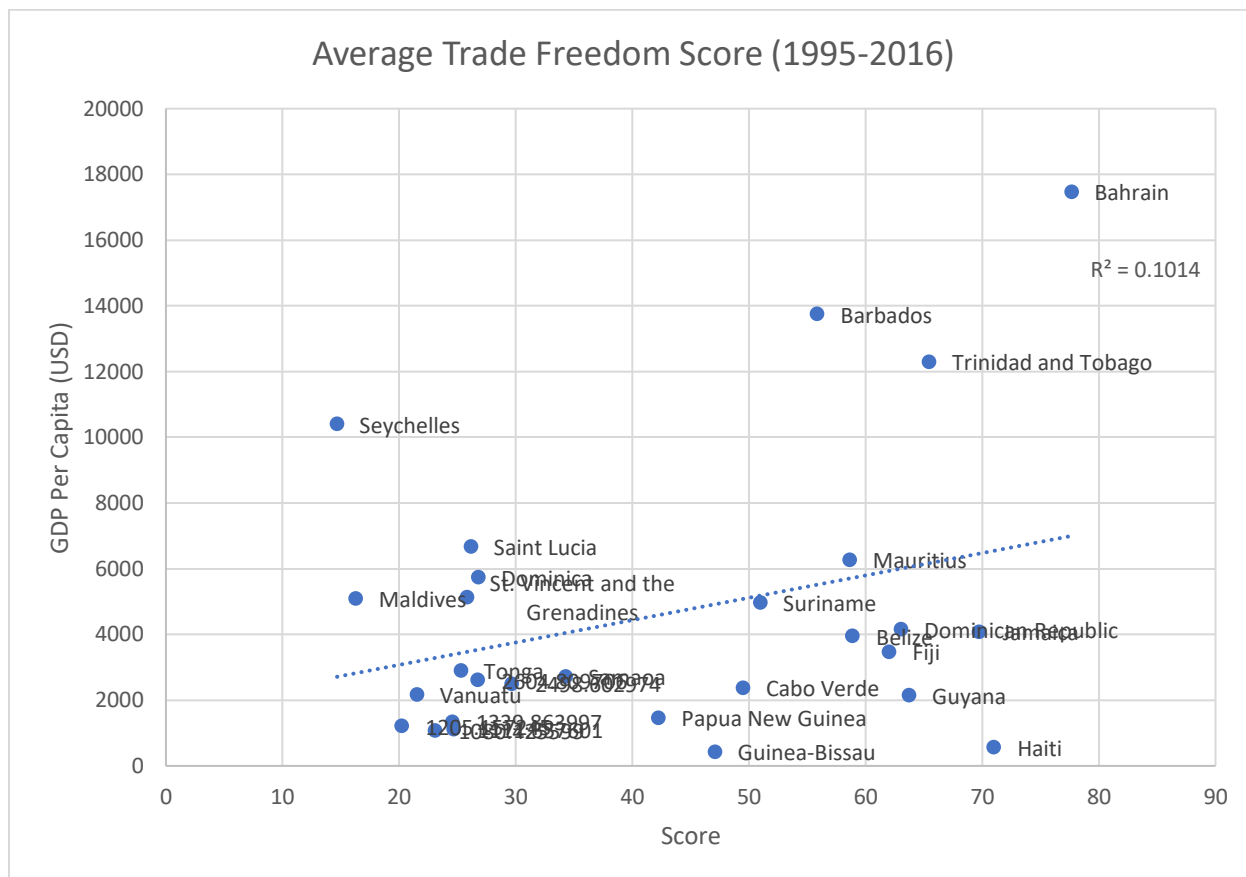
Sources: Heritage.org, WorldBank.org

The figure above shows the average trade freedom score of the 28-small island developing states. Trade freedom is the "composite measure of the absence of tariff and non-tariff barriers that affect imports and exports of goods and services" (Heritage.org). It is calculated based on trade-weighted average tariff rate and non-tariff barriers. Bahrain, Haiti, and Jamaica have the highest trade freedom scores at 77.67, 71.03, and 69.75 respectively. Their average GDP per capita as follows: 17466.77 USD, 561,72 USD, and 4083.41 USD respectively. Despite its lower GDP per capita, Haiti has a considerably high trade freedom score. These three are moderately free while the others are mostly unfree to repressed. For instance, Seychelles, the Maldives, and Kiribati have the lowest trade freedom scores at 14.67, 16.32, and 20.25 respectively. Their average GDP per capita are as follows: 10396.94 USD, 5081.82 USD, and 120516 USD respectively.

The R Square for the data is 0.1014, which indicates that 10.14% of the data can be explained by the model. There is very little correlation between the variables. This suggests that only 10.14% of this data supports the claims of the natural resource curse.

Figure 22: Regression Analysis

Regression Statistics								
Multiple R	0.79373151							
R Square	0.63000971							
Adjusted R S	0.52429819							
Standard Err	2893.25913							
Observations	28							
ANOVA								
	df	SS	MS	F	Significance F			
Regression	6	299330431	49888405.2	5.95970763	0.00092341			
Residual	21	175789917	8370948.42					
Total	27	475120348						
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	1399.26003	1486.83665	0.9410987	0.35735493	-1692.786	4491.30611	-1692.786	4491.30611
Natural Reso	9.64987461	86.2692984	0.11185758	0.91199863	-169.75695	189.056702	-169.75695	189.056702
Property Righ	-44.844192	84.1680615	-0.5327934	0.59976987	-219.88126	130.192874	-219.88126	130.192874
Gov Integrity	395.957458	120.085987	3.29728278	0.00343153	146.224977	645.68994	146.224977	645.68994
Gov Spending	3.35985475	48.8222552	0.0688181	0.94578549	-98.171583	104.891293	-98.171583	104.891293
Businsess Fre	-79.275816	104.793201	-0.7564977	0.45775441	-297.20521	138.653576	-297.20521	138.653576
Trade Freedo	-47.432724	98.3270032	-0.4823977	0.63451351	-251.91492	157.049473	-251.91492	157.049473

Figure 22 is the regression analysis for a combination of natural resources contribution to GDP and property rights, government integrity, government spending, business freedom, and trade freedom scores. The significance level at which these variables are being tested at is 5%. The standard error for this data set is significant at 2,893. The R Square for the data is 0.63. This is not a good fit since only 63% of the data can be explained by the model. The R Square indicates that the variation in GDP per capita cannot be explained by each of the independent variables. Since six independent variables are being tested, the Adjusted R Square must also be considered. The Adjust R Square is 0.52; only 52% of the variation can be explained by the independent variables. The Significance F is less than 0.05, at 0.0009, suggesting that the results are statistically significant. Most of the independent variables have a P value greater than 0.05. The P value for the Average Natural Resource Rents as Percentage of GDP is 0.91, 0.6 for the Average Property Rights Score, 0.95 for the Average Government Spending Score, 0.46 for the Average Business

Freedom Score, and 0.63 for the Average Trade Freedom Score. The Average Government Integrity Score is the only indicator with a P value less than 0.05 at 0.003.

Conclusion

This paper circulates around the theory that over-reliance on oil and gas can create catastrophic effects on states whose reserves are reliant on global shifts. Despite policies that may be put in place to combat this, many small island developing state simply cannot create effective institutions to regulate against global economic shifts. Trinidad and Tobago seems to be an outlier within this data base. Significant literature surround this topic suggests that despite the nation's success, Trinidad and Tobago needs to assure that revenue from its oil and gas reserves are improving other sectors as well. Since Trinidad and Tobago has not experienced a significant period in which it has been without oil and gas, there is little incentive to invest in other sectors. This is problematic because a loss in these non-renewable natural resources may prove to be catastrophic for the country.

Concrete conclusions cannot be drawn from this data set alone. The standard error is extremely high. Most of the P values are insignificant except for the government integrity variable. The correlation coefficient for each of the variables are too insignificant to accurately suggest a correlation between the data sets. The results were solely based on 28 of 58 small islands developing states because much of the variable data was not available for all SIDS. This results in a smaller data pool which does not accurately reflect the effects of natural resources on small island developing states. In each of the correlations in this data set, Trinidad and Tobago, Bahrain, and Barbados are consistent outliers. Trinidad and Tobago outperforms most of the small island developing states in terms of scores for each of the indicators.

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