

Toward Economic Diversification in Trinidad and Tobago

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Abstract

This paper contributes to the predominant diversification debate that has been ongoing in Trinidad and Tobago for more than three decades. The paper makes a determination of the key impediments to the country's attempts at diversification. Econometric techniques are applied on panel data to identify the most significant obstacles to economic diversification for a set of 183 countries. The results indicate that openness to foreign direct investment inflows is the most fundamental driver

of diversification. The findings are then applied to the specific case of Trinidad and Tobago through a detailed analysis of the links in the trends followed by foreign direct investment and diversification between 1980 and 2011. Greater openness to foreign direct investment and improving the business climate appear to be key policies the twin-island republic could implement further in order to expand the range of activities of its economic structure.

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1. INTRODUCTION

Trinidad and Tobago (T&T) is a high-income country², rich in natural resources, with a well-developed globally competitive oil and gas industries. The country can be characterized as a dual economy. Its energy sector is very productive, export-oriented, and exhibits high rates of returns to investment. However, while the energy sector represented 65.8% of exports and 44.0% of gross domestic product (GDP), it only employed 3.1% of the labor force over the last decade³. On the other hand, the non-energy sector is underdeveloped, attracts little investment and, for a significant part, depends on government subsidies and transfers. Between 1994 and 2008, the country's output grew at an impressive average rate of 7.1%⁴. Yet, most of this growth can be attributed to the performance of the oil and gas sectors supported by high energy prices. Over the last decade, average annual GDP growth in the petroleum sector averaged 9.7%. The non-energy sector on the other hand exhibited much slower growth rates with a decade mean of 3.6%⁵. T&T's economy has historically been quite volatile and particularly vulnerable to commodity price shocks (see Figures 1.1 and 1.2).

At current rates of resource extraction, it is estimated that by 2025-2030 gas and oil fields will be fully depleted. This brings into sharp focus the issue of diversification. While successive governments have developed growth strategies to balance economic activity and raise activity in the non-energy sector, there is little evidence of success over the last 25 years. This highlights the issue of identifying and alleviating the binding constraints to T&T's economic diversification. How can the country achieve a sustainable and balanced growth? What is there to be learned from the experience of other resource rich and commodity exporter countries? What are the drivers and obstacles of economic diversification in T&T?

This work is an attempt to find solutions to the various questions highlighted in the preceding paragraph through the use of various econometric estimations and qualitative analysis. This study exploits a large panel data set covering 183 countries over the period 1980-2010 to analyze historical global diversification patterns with a particular focus on T&T. Unlike similar studies, the results in this paper are strengthened through the use of the general method of moment econometric methodology to infer causality. The paper finds that openness to FDI, access to finance, real exchange rate and terms of trade shocks are fundamental determinants of economic diversification. Therefore, greater openness to FDI and improving the business climate emerged as crucial policies to extend the structure of a country's economy.

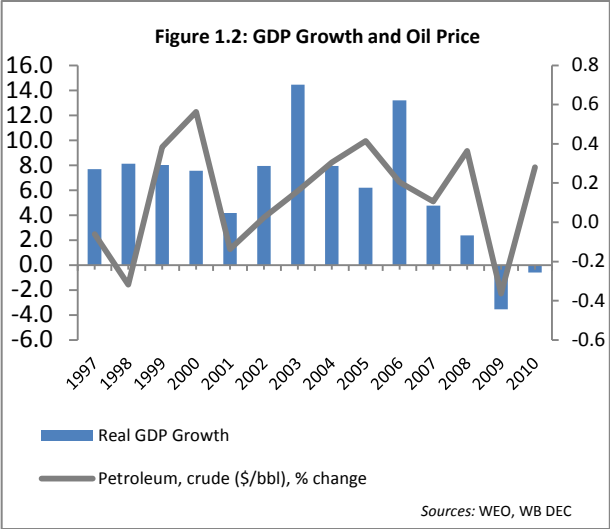
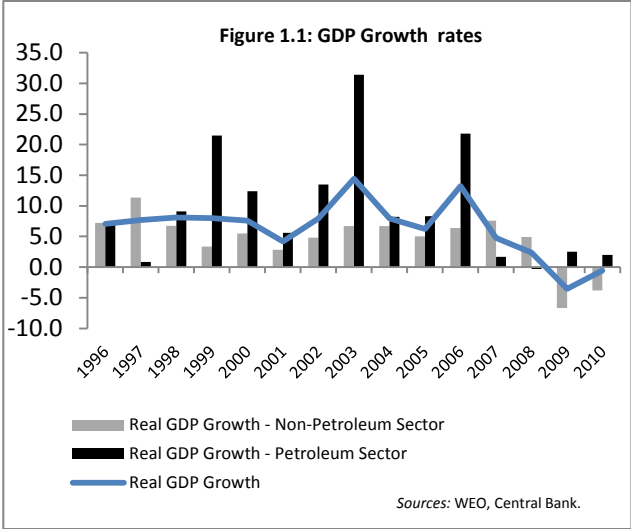
² GNI per capita was US\$14,710 in 2012 (World Development Indicators).

³ Central Bank data and WB staff estimates.

⁴ WEO data and WB staff estimates.

⁵ Central Bank data and WB staff estimates.

The remainder of this paper is organized as follows. Section 2 defines the diversification index and the country categories used as well as stylized facts for T&T and comparison countries. Section 3 tests econometrically the significance of a number of factors thought to influence diversification. The fourth section discusses FDI inflows’ characteristics in T&T, and relevant policies and measures to facilitate economic diversification in the country based on our findings. The last section concludes.



2. LITERATURE REVIEW AND DEFINITIONS

Diversification has been an ongoing issue of debate for several decades in T&T. After having implemented various reforms to foster the development of new activities and to reduce its dependence on energy, T&T must now identify the remaining constraints its private sector faces (see Annex 1 for an overview of diversification and industrial policy in Trinidad and Tobago since the 1950s). A number of authors have analyzed in depth the structure of the twin-island economy and listed what they consider as major impediments to a reduction of the country’s industry concentration. Artana et al. (2007) have identified the chief constraints to economic diversification in T&T using the Growth Diagnostic Methodology (GDM) developed by Hausmann, Rodrik and Velasco (2005). Based on the analysis of both macro and micro data, the authors found that the most important factors limiting growth opportunities in T&T are deficiency human capital, high macroeconomic volatility, an inadequate development of infrastructure, limited access to foreign markets, rising criminality, lack of innovation, corruption and a burdensome bureaucracy.

Elias et al. (2007) analyzed T&T’s institutions and documented poorer than expected quality-of-governance indicators. The authors claim that in the absence of improvements in terms of governance the country might not be able to achieve sustainable high GDP growth rates. To promote the development of a competitive non-energy private sector, Elias et al. recommend the

Government of T&T take a number of measures that can be grouped in four categories: i) enhancement of the flexibility of the labor market; ii) reduction of trade restrictions; iii) development of infrastructure to maximize firms' performance and; iv) strengthening of market institutions.

The development of the private sector seems to be hindered by a list of additional constraints. Balgobin and Omar (2006) claim the overlapping and conflicting responsibilities of line ministries weaken the expansion of the private sector. To develop a project, private investors must see their business proposals being evaluated by redundant public agencies resulting in administrative delays and unnecessary costs. Balgobin and Omar (2006) also indicated that institutional strengthening is a necessary but insufficient condition to boost national competitiveness. According to the World Economic Forum Global Competitiveness Report 2011/12, T&T has a clear technology handicap in both national infrastructure and individual use. The country's performance in capacity for innovation and research-and-development (R&D) readiness could also be improved.

2.1 Measurement of Diversification

To understand the diversification process in T&T, it is necessary first to measure the level of concentration of the economy. Second, the potential drivers of diversification must be identified. Third, to determine the factors affecting diversification, a control group of comparable countries is developed and the historical influence of the potential factors for the selected countries analyzed. Finally, the relevance of the lessons drawn at the international level must be assessed with domestic data for T&T.

Given that for most countries no data are available for the economy-wide level of diversification, the level of export concentration is often used as a reliable proxy. It is assumed that the composition of exports reflects the overall structure of the economy. The Herfindahl-Hirschman index (HH index hereafter) is used to measure export diversification and is the most commonly used statistic for this purpose. It is calculated as follows:

$$\text{Herfindahl-Hirschman Index} = \sum_{i=1}^n S_i^2,$$

where S_i is the share of industry i in total exports and n the number of sectors in the economy.

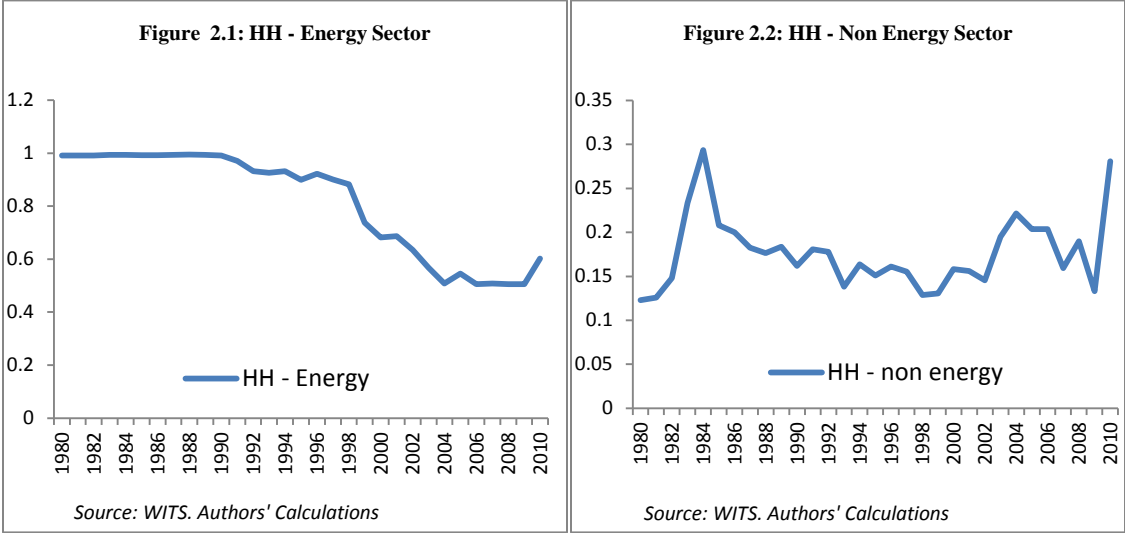
The Herfindahl-Hirschman index is the sum of squared shares of each product in total export. A country with a perfectly diversified export portfolio will have an index close to zero, whereas a country which exports only one product will have a value of 1 (least diversified). Observations for the HH index are extracted from the World Integrated Trade Solution Database (WITS) and are calculated with annual country export data recorded in the SITC Revision 2 COMTRADE database. We use two-digit level data.

Table 2.1 shows the average diversification performance for selected countries for the period 1980-2010. T&T appears to have made significant progress in terms of diversification over the last three decades (its HH index did contract by more than 70 %). It has also undertaken a very rapid transformation in terms of diversification over the review period relative to countries with similar structural characteristics. There seems to be greater limitations in terms of diversification for oil net exporters as the average HH index for this group of counties is above the HH average for all other groups. Since the end of the 1990s, T&T has been placed below the net oil exporters’ average concentration index. It was also observed that while T&T has become more diversified over the past 30 years it remained less diversified than the average of country groups with which it shares significant structural characteristics.

Table 2.1: Export Diversification Performance

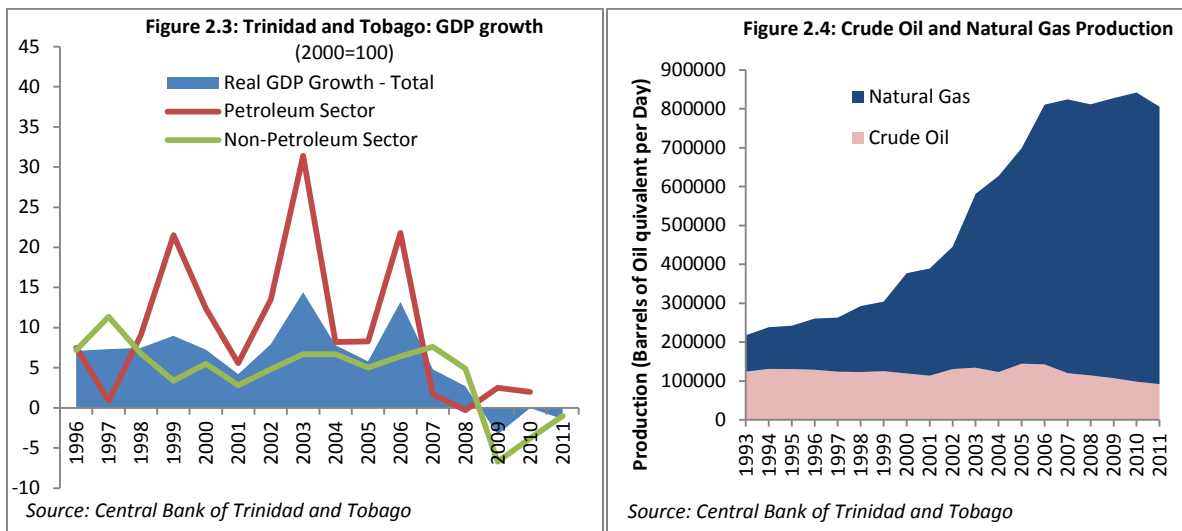
Country	HH Index			
	1980	1990	2000	2010
Trinidad and Tobago	0.8706	0.4597	0.3059	0.2480
Indonesia	0.3743	0.1305	0.0543	0.0560
Saudi Arabia	0.9414	0.7424	0.8377	0.6916
World	0.2553	0.2168	0.2399	0.1957
LAC	0.3573	0.2427	0.1872	0.1816
Caribbean	0.5328	0.3508	0.2227	0.1607
Oil net exporters	0.3580	0.3068	0.3684	0.2691
Island countries	0.3059	0.2286	0.2652	0.2429
Oil net exporter Islands	0.3566	0.2441	0.1516	0.1161

Source: WITS & authors’ calculations



Though T&T has made significant strides in terms of diversification, in 2010 the energy sector still accounted for 66% of exports and 44% of GDP. Most of the country’s diversification has indeed happened within the energy sector as can be seen in Figures 2.1 and 2.2. Oil production has been following a declining trend since the 1980s, and has been replaced by natural gas as the

dominant activity in the energy sector (Figures 2.3 and 2.4). Natural gas output is now about eight times the magnitude of oil output. In addition, growth in production of petrochemicals has mirrored growth in the production of natural gas. T&T has become the world's leading exporter of ammonia and methanol, which together with urea make up the main petrochemical products in the country. We can still interpret this whole process as a confirmation that diversification, at least vertical diversification within the energy sector, has happened and can continue to happen in T&T. Looking ahead, there may also be useful knowledge to extract from what worked in the past and allowed the transformation of the energy sector. Whether the continuation of the diversification process for T&T should continue in the vertical path or whether it should also extend to the horizontal path, is a question policy makers ought to reflect on.



2.2 Data

To put the experience of T&T into perspective, an attempt is made to construct a group of comparable countries and develop a consolidated net commodity exporter category. Countries that fit into this category are defined as net exporters of fuel, metals and ores for at least five years in the 2000s⁶. The list of control countries is restricted to non-OECD and non-European Union member countries as these countries share particular institutional characteristics. Additionally, given the limited size of T&T's economy, countries with a population of more than ten million were excluded. This generated a list of fifteen control group countries located across regions (see Table 2.2). The rationale behind the creation of this comparison group is to have a set of countries similar to T&T at hand so as to: i) assess whether commodity-rich countries share particular characteristics in terms of diversification, and ii) evaluate whether specific policies have a differentiated impact between commodity exporters and commodity importers.

⁶ Commodity exports data come from the World Development Indicators database.

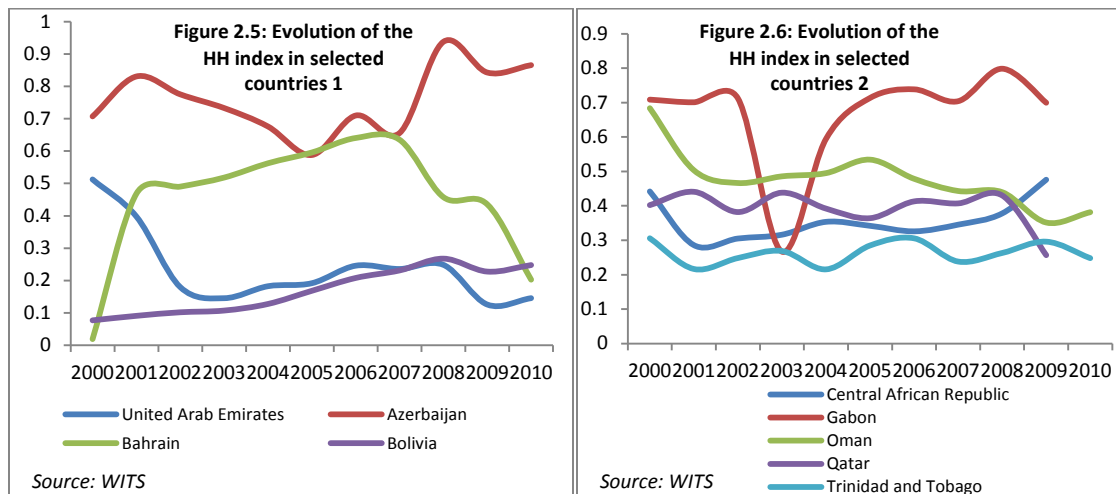
Table 2.2: Net Commodity Exporter Countries

United Arab Emirates	Brunei Darussalam	Guinea	Oman
Azerbaijan	Bhutan	Kuwait	Papua New Guinea
Bahrain	Central African Republic	Mongolia	Qatar
Bolivia	Gabon	Namibia	(Trinidad and Tobago)

Authors' classification.

2.3 Stylized facts

Figures 2.5 and 2.6 show the historical trends of the HH concentration index for a few net commodity exporters between 2000 and 2010. There appears to be significant heterogeneity and volatility in the diversification experiences of these countries. Bahrain, Oman, and the United Arab Emirates have successfully expanded the range of economic activities oriented towards foreign markets in the second half of the last decade. On the contrary, the concentration of exports has gradually increased in Bolivia and the Central African Republic. Some sharp diversification reversals can be observed in Azerbaijan and Gabon in the latter half of the decade. Lastly, the experience of T&T, although starting from a lower concentration level, appears to be rather analogous to Qatar and Oman.



3. ECONOMETRIC SECTION

In this section, the respective importance of the potential drivers of concentration/diversification are tested consistent with the quantitative methodology adopted by Al-Kawaz (2008) and Agosin, et al. (2012). Al-Kawaz (2008) develops an econometric model to identify the main determinants of economic diversification in a group of selected oil producing countries (Indonesia, Iran, Kuwait, Oman, and Venezuela). The author runs pooled weighted least squares regressions over the period 1991-2001 using the UNCTAD diversification index as dependent variable and nine explanatory variables including per capita income and its square value, investment and its square value, inflation, institutional constraint, population, openness and real exchange rate. Al-Kawaz finds investment and higher quality institutions appear to have a strong and positive impact on diversification. Higher inflation discourages the development of new

activities. Finally, openness to trade seems to foster diversification. In terms of the variables used, the main difference with our model is that Al-Kawaz uses the square value of per capita income and the square value of investment to represent the effect of the early and later stage of economic growth process on diversification. Instead, this paper uses GDP per capita expressed in logarithm to capture the non-linear impact of economic development. Additionally, this paper uses a much larger dataset covering many countries.

Similarly, Agosin, et al. (2012) empirically estimate the determinants of export diversification using a large dataset covering 161 countries over the period 1962-2000. The authors use the generalized method of moments estimator (GMM) to deal with the endogeneity of some of their explanatory variables. Their results suggest that greater trade openness induces higher specialization. Counter intuitively, financial development is not found to influence export diversification. Real exchange rate volatility and overvaluation do not seem to have a significant effect on diversification. Human capital accumulation is found to be positively associated with diversification. Moreover, while positive terms of trade shocks tend to increase export concentration, the effect appears to be less important for countries endowed with higher stocks of human capital. Agosin et al. test the robustness of their results with three measures of concentration: the Herfindahl-Hirschman index, the Gini index, and the Theil indicator. In addition to the set of variables we use, the authors look at the effect of economic distance on concentration.

3.1 Potential Drivers of Concentration/Diversification

The literature on the main drivers of diversification is not abundant. The set of potential drivers analyzed here is taken from Agosin et al. and Al-Kawaz, and can be divided in three main categories: economic reforms, structural factors and macroeconomic variables. Table 3.1 provides these variables' definitions, their expected impact on economic diversification, and their effect on diversification previously found in the related literature. Table A.2 presents summary statistics in Annex 2.

Table 3.1: Description of explanatory variables in the model, expected impact and literature findings

1. <u>Economic Reforms</u> : Trade openness and access to finance	
<i>Openness to trade</i>	<ul style="list-style-type: none"> - Measured as the ratio of exports and imports to GDP. It is taken from the World Economic Outlook (WEO) database of the International Monetary Fund (IMF). - The effect of trade liberalization on diversification is a priori not obvious. Traditional theories of international trade argue that greater openness leads to higher specialization in the sectors where countries have comparative advantages. On the other hand, the removal of barriers to trade can encourage investors to start new or expand export activities. - Agosin, et al. (2012) obtain econometric results indicating that trade openness favors concentration.
<i>Access to finance</i>	<ul style="list-style-type: none"> - Measured as the share of domestic credit to the private sector in GDP and is extracted from the World Development Indicators database (WDI) of the World Bank.

	<ul style="list-style-type: none"> - Financial development, by reducing liquidity constraints may favor entry into international markets and facilitate export diversification. - The results of Agosin, et al. (2012) suggest that financial development facilitates diversification. Mala and Ulabasoglu (2013) find that countries with more developed financial markets tend to be more diversified.
<p>2. <u>Structural Factors</u>: Country population, human capital, and the quality of institutions</p>	
<i>Population</i>	<ul style="list-style-type: none"> - Figures are taken from WDI. - The larger the population the more diversified a country may be as local firms have access to a larger market and thus benefit from economies of scale. - Al-Kawaz (2008) finds that countries with larger population are more diversified.
<i>Human capital</i>	<ul style="list-style-type: none"> - Proxied by net enrolment ratio at the primary school level and is extracted from UNESCO Institute of Statistics. - A country's stock of human capital is expected to have a positive effect on diversification as it may allow economies to change their specialization patterns away from primary commodities towards more knowledge-intensive manufactured goods. - The results of Agosin, et al. (2012) show that human capital accumulation affects positively diversification. Mala and Ulabasoglu (2013) find that in countries with relatively more advanced technology, FDI contributes to reduce concentration.
<i>Quality of institutions</i>	<ul style="list-style-type: none"> - Proxied by the sum of the <i>Investment Profile</i> index and <i>Law and Order</i> index of International Country Risk Guide (ICRG). These indicators measure institutional quality directly related to property rights, such as expropriation risk; the risk of contract repudiation by the government; the strength and impartiality of the legal and judicial system; observance of the law. The aggregated index ranges from 0 to 12, where higher values indicate better institutions and greater property rights security. - It is expected that political and economic institutions that create a friendly investment environment foster business confidence and cultivate the development of new business activities. - Al-Kawaz (2008) finds that higher quality institutions encourage the development of new export activities. Mala and Ulabasoglu (2013) find that FDI can help diversify manufacturing activities in countries with flexible labor market regulations.
<p>3. <u>Macroeconomic Factors</u>: real exchange rate, inflation, net FDI inflows, the terms of trade and investment as a share in GDP. The variables are taken from WEO, WDI, and World Bank-IMF country calculations.</p>	
<i>Real Effective Exchange Rate Variation (REER)</i>	<ul style="list-style-type: none"> - REER index from WB/IMF: 2005 = 100; annual percentage change used. An increase in a country's REER represents a currency depreciation, whereas a decrease in a country's REER represents a currency appreciation. An overvalued exchange rate may reduce investment profitability and discourage investors from new activities. - Agosin, et al. (2012) find that a real overvaluation of the exchange rate leads to some extent to greater export concentration.
<i>Inflation</i>	<ul style="list-style-type: none"> - Annual consumer price index (CPI) annual percentage variation. Inflation is also expected to reduce predictability and thus deter private sector development. - Al-Kawaz (2008) finds that higher inflation does not encourage the creation of new export activities.
<i>FDI inflows</i>	<ul style="list-style-type: none"> - The sign of the impact of FDI inflows is a matter of empirics. Foreign investors may choose

	<p>to concentrate their resources in a few very profitable sectors or on the contrary be interested in the development of unexploited economic activities.</p> <ul style="list-style-type: none"> - Mala and Ulabasoglu (2013) find robust evidence that FDI alter the sectorial composition of manufacturing employment.
<i>Terms of trade</i>	<ul style="list-style-type: none"> - Ratio of the price of exports of goods and services to imports of goods and services (2000=100). The consequences of terms of trade improvements may be two-fold. Higher terms of trade may raise export concentration as factors of production are reallocated to the few main sectors for which output prices have increased. On the other hand, higher terms of trade can lead to greater export profitability and result in higher diversification. - Agosin, et al. (2012) find that positive terms of trade shocks reduce export concentration, but the effect is lower for countries with higher levels of human capital.
<i>Investment</i>	<ul style="list-style-type: none"> - Gross fixed capital formation, as a percentage of GDP. It is introduced in the set of explanatory variables to assess the effect of total investment on the composition of exports. - Al-Kawaz (2008) finds that capital investment has a strong and positive impact on diversification.
<i>Income per capita</i>	<ul style="list-style-type: none"> - PPP real GDP per capita (expressed in logarithm). It is added as an independent variable to control for each country's level of economic development. - Imbs and Wacziarg (2003) find a U-shaped relationship between sectorial diversification and the level of per capita income. Countries first diversify, but relatively later in the development process, they start specializing again.

The graphs of the average HH index against each potential diversification determinant for the period 1980-2010 (decomposed in six sub-periods) can be found in Annex 2. There appears to be a relationship between the level of concentration of an economy and the quality of institutions, the real exchange rate, inflation and FDI inflows. Countries with more transparent institutions, less inflation, and more open to FDI tend to be more diversified. A high real exchange rate appears to be detrimental to diversification. Overall, the analysis of these charts suggests that some of the potential determinants described here could indeed have an influence on export diversification.

3.2 Estimation Methodology - Generalized Method of Moments

To assess the determinants of economic diversification, we rely on dynamic panel GMM estimations following Agosin et al. (2012) and estimate equation (1):

$$D_{i,t} = \alpha + \beta \cdot D_{i,t-1} + \gamma \cdot X_{i,t} + \eta_i + d_t + v_{i,t} \quad (1)$$

where $D_{i,t}$ is the Herfindahl-Hirschman index of export concentration for country i at time t , which is explained as a function of a matrix of explanatory variables $X_{i,t}$, the lagged value of the Herfindahl-Hirschman index of export concentration $D_{i,t-1}$, a country fixed effect η_i , a time dummy d_t , and $v_{i,t}$ an error term. The index of concentration is lagged to account for the persistence of the export structure over time, and the country fixed effects account for the influence of unobserved time-invariant country-specific characteristics that may explain

diversification patterns across countries. In addition the use of fixed effects mitigates the potential impact of having a non-random sample. Some countries are more likely to have gaps in their data due to an un-observable effect, and this is captured to some extent by the fixed effect (Wooldridge, 2009, p. 488). The dynamic panel nature of the data rules out the use of pooled OLS or within fixed-effects estimations as these methodologies would produce biased estimates. The presence of the lagged dependent variable among the explanatory variables causes correlation between the error term and the lagged variable in the within transformation used to obtain fixed effects estimates. Since the other regressors are likely to be correlated to some extent with the lagged dependent variable, their coefficients would also be biased.

For estimation purposes, the period 1980-2010 is divided into six sub-periods of five years each. The average of all variables included in the estimation is computed for each period t . This allows us to eliminate the influence of business cycles on the results as well as to minimize the potential for attenuation bias stemming from measurement errors in the data.

Equation (1) is estimated with the “GMM system estimator” of Arellano and Bond to solve the econometric problems caused by the presence of the lagged dependent variable in the set of the right hand-side variables. The GMM system estimator has been demonstrated to be more efficient and less biased than the Arellano and Bond’s difference estimator (Kpodar, 2007). The system estimator combines lagged levels as well as lagged differences as instruments. The period dummies are treated as strictly exogenous, while all the other explanatory variables are considered non-endogenous. The size of the matrix of instruments is reduced so as to avoid over-instrumentation bias. We estimate our autoregressive model with robust standard errors and the t -statistics obtained are presented in what follows.

3.3 Empirical Findings

The GMM findings are presented in Table 3.2. In all cases, Hansen tests p -values do not reject the null hypothesis that the lagged instruments in levels and differences are valid. Moreover, Arellano and Bond’s auto-correlation of second order tests fail to reject the hypothesis of absence of second order auto-correlation.

In all specifications, access to finance, terms of trade shocks and FDI inflows have a significant effect on diversification. *Ceteris paribus*, countries receiving more direct investments tend to be more diversified. This suggests that foreign investors tend to develop new industries instead of pooling their resources in sectors already oriented towards international markets. Terms of trade shocks appear to be associated with a concentration of the export base, hereby suggesting that relative prices variations are accompanied by a reallocation of factors of production towards the sectors where profitability has increased. Moreover, the interaction term between terms of trade and human capital shown in column (4) is significant and negative. Agosin et al. (2012) find a similar result, which suggests that the concentrating effect of terms of trade shocks is less important for those countries with higher levels of human capital. Financial development has a

negative and significant coefficient. By reducing liquidity constraints, a greater access to credit may indeed stimulate export activities as all else equal, countries where investors face fewer barriers to access credit are more diversified. Real exchange rate variations also appear to have a strong impact on diversification patterns. Currency real appreciations are found to translate in a higher concentration of the export base in all but one specification. This is consistent with the argument that a real appreciation reduces investment profitability.

Population, the quality of institutions, income per capita and openness are insignificant in all specifications. Institutional quality and the commodity exporter dummy were interacted to test for a conditional effect of resource wealth. One may expect that countries with stronger institutions control rent seeking behaviors associated with mineral wealth better and reorient more effectively resource rents towards other sectors of the economy. The coefficient estimate turns out however to be insignificant. To address the concern that in island countries FDI inflows may have a different effect than in other countries, a dummy for island nations was interacted with FDI inflows. While the interacted term shown in column (7) is not significant, all the other right-hand side variables remain significant and of the same sign, suggesting that the effect of FDI on diversification does not differ in island countries.

Table 3.2 presents GMM system estimates with standardized variables, which allows to rank the diversification determinants by order of impact magnitude. The results show that real exchange rate variations have the largest effects on concentration patterns. The results presented in column (2) show that a one standard deviation increase in real exchange rate depreciation leads to a 1.8 standard deviation decrease in concentration. FDI is the determinant with the second largest potential impact on diversification. In column (2), a standard deviation increase in FDI inflows is associated with a 10.7% increase in diversification. The list of determinants with the largest potential impact on diversification is followed by access to finance in the third place and terms of trade shocks in the fourth place. In the same column, it is shown that a one standard deviation increase in access to finance and terms of trade leads respectively to an 8.5% decrease and a 7.0% increase in export concentration.

Table 3.2: GMM system estimates. Standardized variables – World sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Lagged HH index	0.914*** (12.67)	0.891*** (11.49)	0.863*** (9.902)	0.850*** (11.11)	0.886*** (10.43)	0.907*** (12.25)	0.894*** (11.76)
Population	-0.00554 (-0.350)	0.00588 (0.345)	0.0284 (1.502)	-0.00201 (-0.109)	0.00343 (0.192)	0.00682 (0.415)	0.00733 (0.435)
Quality of Institutions	-0.0174 (-0.274)	-0.0212 (-0.311)	-0.0277 (-0.428)	-0.0778 (-1.133)	-0.00429 (-0.0617)	-0.0214 (-0.312)	-0.0189 (-0.283)
Access to Finance	-0.0495* (-1.764)	-0.0849*** (-2.659)	-0.0748*** (-2.959)	-0.0729** (-2.503)	-0.0864*** (-2.658)	-0.0821** (-2.557)	-0.0858*** (-2.736)
Income per capita	0.00740 (0.0646)	0.116 (1.187)	0.152* (1.818)	0.120 (1.338)	0.112 (1.100)	0.107 (1.065)	0.118 (1.202)
Inflation	-0.0165 (-0.548)						
Openness	0.0265 (0.646)	0.00638 (0.147)	0.0239 (0.530)	0.0136 (0.385)	-0.00674 (-0.139)	0.0161 (0.397)	0.00951 (0.220)
Human Capital	0.0723 (0.767)	-0.000146 (-0.00184)	-0.0619 (-0.728)	0.500** (2.037)	0.00698 (0.0863)	0.00917 (0.111)	3.44e-05 (0.000414)
Terms of Trade (ToT)	0.0857*** (3.697)	0.0729** (2.390)	0.0916*** (2.926)	0.476*** (2.781)	0.0831*** (2.738)	0.0739** (2.426)	0.0690** (2.271)
FDI inflows	-0.135*** (-2.693)	-0.107** (-2.332)		-0.0778** (-2.010)	-0.108** (-2.152)	-0.105** (-2.301)	-0.117** (-2.045)
Net Commodity Exporter Dummy	-0.0241 (-0.212)	-0.0609 (-0.484)	-0.0131 (-0.108)	-0.0172 (-0.149)	-0.149 (-1.250)	-0.0689 (-0.544)	-0.0364 (-0.312)
Real Exchange Rate Variation		-1.843*** (-2.770)	-1.682*** (-2.838)	-0.633 (-0.850)	-1.760** (-2.582)	-1.861*** (-2.787)	-1.892*** (-2.895)
Investment			-0.137 (-1.253)				
ToT * Human Capital				-0.596** (-2.248)			
Institutions * Commodity Exporter Dummy					-0.0260 (-0.642)		
Island dummy						0.0327 (0.729)	
Island dummy * FDI inflows							0.0438 (0.641)
Constant	-0.0598 (-0.837)	-0.103 (-1.357)	-0.114 (-1.631)	-0.0645 (-0.825)	-0.0721 (-0.980)	-0.107 (-1.387)	-0.116 (-1.607)
Observations	338	342	344	340	342	342	342
Number of countries	113	111	112	110	111	111	111

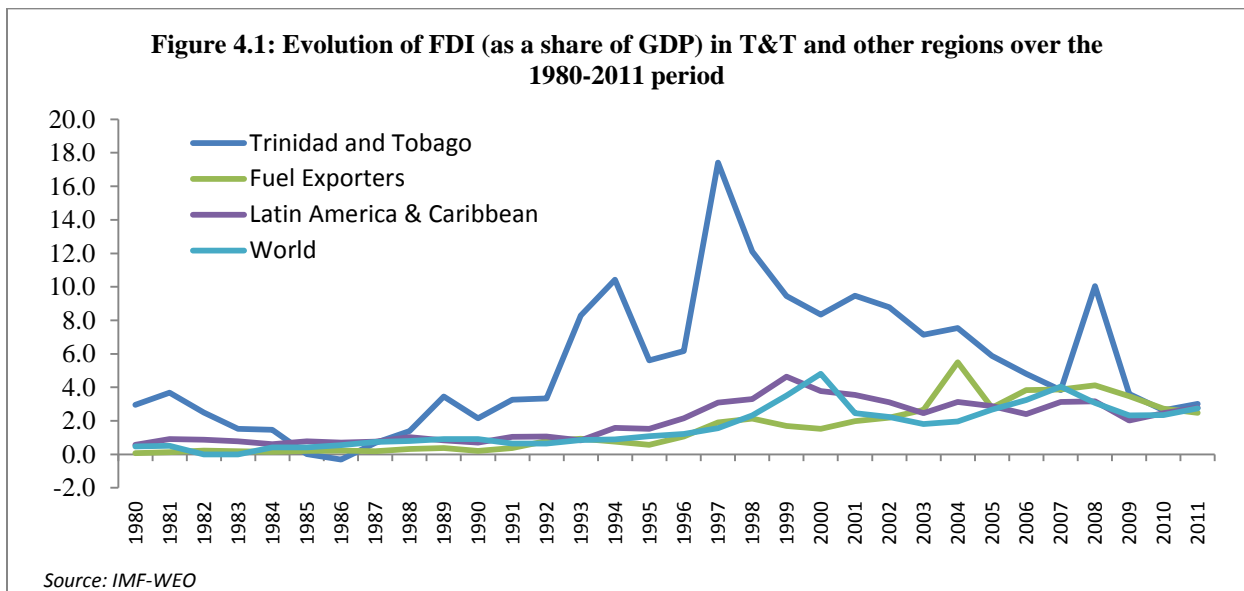
Robust t-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1

4. FDI IN T&T

The results obtained in the econometric section indicate that openness to FDI inflows is a fundamental driver of diversification. In order to apply the findings to the specific case of T&T, this section undertakes a detailed analysis of the links in the trends followed by FDI and diversification in T&T between 1980 and 2011. The section concludes by identifying the key policies the twin-island republic could implement to further leverage the benefits of FDI inflows.

4.1 Stylized Facts

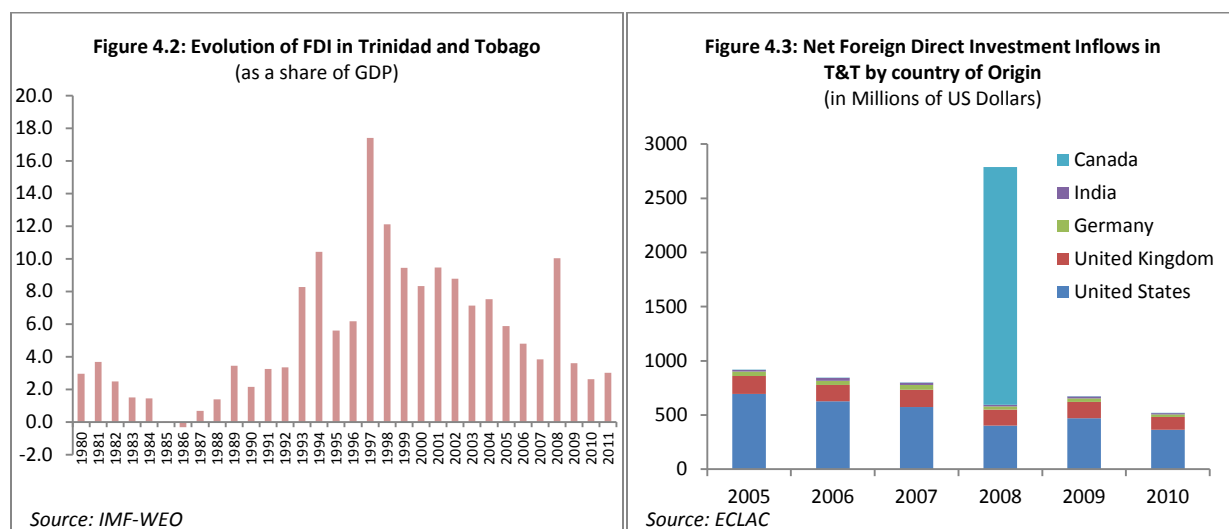
Between 1980 and 2000, FDI inflows in T&T have followed an increasing trend marked by significant volatility. Over the last ten years, inflows of direct investments have gradually declined with the exception of 2008 (see Figures 4.1 and 4.2). One of the possible explanations of why FDI inflows were severely impacted in T&T in 2009 and 2010 is probably the global financial crisis and the fact that the main source of FDI in T&T has traditionally been the US which was at the epicenter of the crisis. By 2011 direct investments started to recover. T&T is also characterized by relatively large and volatile capital inflows when compared to other countries in LAC (FDI inflows averaged 6.6% of GDP during the 1988-2011 period, above the LAC average of 2.4% of GDP over the same period). Further, FDI performance in T&T and the LAC region appears to be quite correlated.



Most of the FDI in T&T is associated primarily with large energy projects; particularly natural gas projects following the deregulation of the sector (see Figure 4.3). Both petroleum production and gas production are clearly dominated by foreign participation. In 2010, about 60% of crude oil was produced by private companies, of which almost 80% was accounted for by three foreign companies. Natural gas production was also dominated by three foreign companies (BP Trinidad

and Tobago, British Gas, and EOG Resources Trinidad) which accounted for 95% of production (IMF Article IV, 2012).

Increased international competition to attract FDI is one of the main features of the 30 years period analyzed. In the 1980s and 1990s, T&T was able to maintain its position as a top performer in terms of the amount of investments it was successful in attracting. In the 2000s, however, the number of countries showing very attractive profiles for FDI as well as the diversity of profitable sectors for FDI significantly increased. As a result, T&T faced increasing competition and no longer succeeded in being as successful in terms of FDI received. Thus, in the overall ranking based on available data, the country fell from the 10th position out of 145 countries in 1990 to the 83th position out of 175 countries by 2011.

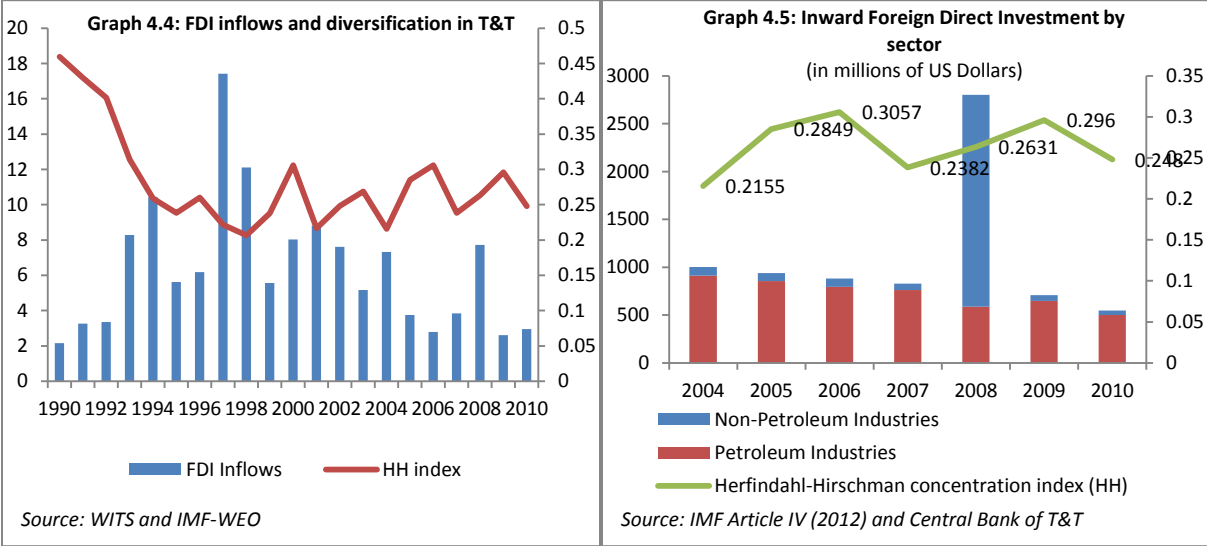


As discussed above, FDI in T&T has been mostly concentrated first in the oil sector and at a later stage in the gas sector. This transition helped the economy to diversify its energy sector but not the non-energy sector (ECLAC, 2003). Later, the country succeeded in attracting new investments in other sectors but this contributed to only slightly expand the numbers of economic sectors in the economy. Not having a developed non-energy tradable sector will probably limit future growth due to lack of externalities in production, lack of forward and backward linkages, shortages of learning by doing and lack of entrepreneurship. Consequently, the country has taken measures to stimulate the non-resource based economy.

4.2 Public Policies

Over the last decades, the Government of T&T took measures directly aimed at encouraging FDI inflows into the energy and non-energy sectors. FDI were also implicitly understood as a strategic means of diversification since it was believed FDI would also act as a source of revenue for investments in physical and human capital, which the country required in order to support the development of other sectors. The economy maintained strong tax incentives (bilateral investment agreements, double taxation treaties, and reciprocal regulatory agencies

arrangements) and supported the implementation of Free Trade Zones (FTZs) to facilitate export diversification and attract FDI in the energy sector as well as downstream manufacturing industries linked to energy-based projects. The Government was confident this would contribute to overcome obstacles and distortions in the rest of the country and eventually generate forward linkages to the development of manufacturing industries outside the energy sector. The Government has also tried to actively promote foreign investments and established the Trinidad and Tobago Country Branding and Investment Promotion in charge of the administration of existing Industrial Parks.



Given the high ratio of FDI to GDP in T&T, evidence from the lack of diversification outside the energy sector suggests that T&T was not able to fully maximize the potential benefits of the large FDI it received (see Figures 4.4 and 4.5). As Mohammed (2010) indicates, the additional benefits that a foreign investor can bring depend on whether that investor generates spillovers to the rest of the economy through employment, technology or innovation. This, at the same time, is strongly associated with the type of activity of the investing company and how it connects to other producers. The findings of Mohammed (2010) also show that FTZs have stronger spillover effects in countries where the local technology can be complementary to the FDI and weaker effects in countries with a wide technological gap. This may be a partial explanation of why FDI inflows have not substantially fostered diversification outside the energy sector in T&T. The country’s technological and human capital is indeed still below its potential outside of the oil and gas sectors. Linking FDI incentives to human and technological capital development, as well as finding various ways of engaging the domestic and foreign private sector in this mission, would enable T&T to better seize the benefits of FDI in terms of economic diversification.

Moreover, Mala and Ulabasoglu (2013) document heterogeneous effects of FDI on sectorial diversification. Using a large panel dataset, they arrive at the conclusion that in countries with higher technology, a stronger financial system, and higher efficiency wages, FDI tends to

diversify manufacturing employment. Conversely, in natural resource rich countries, FDI is found to have a concentrating effect. The results of the authors thus strengthen the policy recommendation to actively close T&T's technological and human capital gap, and invite policy makers to consider improving the functioning of financial and labor markets.

Further, the United Nations Economic Commission for Latin America and the Caribbean (ECLAC) 2003 report finds that in the Caribbean islands FDI inflows combined with trade liberalization have had a large influence on the patterns of specialization, and have very significantly determined the export structure of these countries. The report also mentions that the central feature of the FDI-specialization nexus seems to be the role of FDI in reinforcing the existing relatively low value, low technology intensity production in the sub-region. The authors specifically mention the case of T&T and how FDI flows to the energy sector have reinforced the entrenched dominance of and specialization in this sector as well as shifted the country's static comparative advantage in the petrochemical sector and mostly to downstream activities.

Blonigen and Piger (2011) find that bilateral agreements, including regional trade agreements, bilateral investment treaties, and customs unions are policies which influence direct inflows. In addition, Benassy-Quere, Coupet and Mayer (2007) show that institutions also matter. In particular, their results point out bureaucracy, corruption, but also information, banking sector and legal institutions as important determinants of inward FDI. Further, Habib and Zurawicki (2002) find that corruption in recipient countries has a negative effect on FDI inflows.

The available evidence thus suggests that FDI to T&T have not led to significant dynamism and structural transformation, constraining both the breakthrough into the highest value added segments of the energy industry as well as the breakthrough into the non-energy sector. The key question for the authorities of T&T is thus how to transition from this situation of reinforced resource based activities to a situation of greater non-energy diversification and new specialization in the high value segments of energy activities. To do so, certain actions would have to be taken. Given that competitiveness today is based more on human, technological and social capital than on natural resources, the evidence suggests that the Trinidadian Authorities ought to further reflect on the need to develop a highly competitive education and training system. The technological capacity of the country ought also to be enhanced. An additional challenge for the country would be to find the way to have the domestic and foreign private sector entrepreneurs participate in this effort and also agree to transfer technological knowledge. Lastly, bilateral trade and investments treaties, as well institutional reforms, are policy options the Government of T&T could seize to help reduce the concentration of the country's economy.

Box 1. Dutch Disease

The reasons why T&T struggles to diversify its economy and whether T&T has been suffering from the “Dutch disease” phenomenon are recurrent topics among concerned policy circles. Dutch disease is a term that broadly refers to the harmful consequences of large increases in a country’s income. Although the disease is generally associated with a natural resource discovery, it can occur from any developments that results in a large inflow of foreign currency, including a sharp surge in natural resource prices or foreign assistance (Ebrahim-Zadeh, 2003). The sizable inflow of foreign currencies raises income and is usually converted into local currency so as to be spent on domestic traded and non-traded goods. The conversion of the foreign currency into local currency leads to either an increase in the money supply resulting in higher domestic prices or an appreciation of the nominal exchange rate of the local currency, depending on the exchange rate regime of the country (fixed or floating). The rise in domestic prices and the higher value of the local currency both result in an appreciation of the real exchange rate, which weakens the competitiveness of the country’s exports and causes the traditional export sector to shrink. This process is called the “spending effect”, the adverse consequences of which are reinforced by the “resource movement effect”. As the commodity export sector is booming and the demand for non-traded goods increases, productive resources (capital and labor) shift into these sectors away from the traditional export and manufacturing activities causing their production to fall (the so-called resource movement effect). As capital and labor change sectors, an economically and politically painful transition occurs as industries are forced to shut down and workers to find new jobs. The transition is all the more costly as ‘learning by doing’ industries disappear and hereby harms the country’s long term growth potential.

In the case of T&T, the problem is actually not so much to know whether the country has suffered from Dutch disease but the extent to which the phenomenon has been harming the country’s development. Indeed, Mohammed et al. (2010) claim that in T&T Dutch disease is not a cyclical phenomenon but a permanent characteristic of the economy given the historical preponderance of oil and gas in total exports over the last three decades. Artana et al. (2007) argue that the Dutch disease phenomenon accounts for only part of the reasons why T&T has failed to significantly develop its non-energy sector. The authors find several others factors that have limited the expansion of economic activities in line with our findings. First, evidence is found that the natural resource abundance has affected public policies. Fiscal policy has been rather pro-cyclical in past years and, even though prudent fiscal management mechanisms have been created lately, the credibility of the authorities has suffered, hereby exacerbating the macroeconomic risk perceived by business leaders. Second, the unsatisfactory quality of education appears to be another binding constraint in their study. Moreover, insufficient innovation and technological readiness outside the energy sector are listed as further impediments. Infrastructure bottlenecks are also found to constrain diversification. Lastly, the rising criminality observed in recent years appears also to discourage entrepreneurship.

5. CONCLUSION

T&T has successfully achieved progress in the roadmap to diversification in which it has been engaged for several decades, albeit in the energy sector. Convergence towards the world average level of export concentration over the period 1980-2011 can be observed, and the country has transformed into an oil and gas economy from a solely oil-based economy. Nevertheless, further diversification away from the oil and gas sectors is possible and likely desirable as it would reduce the vulnerability of the economy to commodity price shocks and contribute to securing output growth for many years after the full depletion of the countries' limited oil and gas resources.

We have attempted to determine the significant drivers of diversification episodes across the world and T&T using both descriptive statistics and econometric estimations. We have exploited a large panel dataset covering 183 countries over the period 1980-2010, and our econometric findings indicate that openness to FDI and access to finance are fundamental determinants of economic diversification over which the government has some control.

To diversify further its economy, these findings suggest that T&T could aim to attract more FDI in the non-energy sector and take measures aimed at increasing FDI induced spill-overs in the energy sector. Based on the findings of the FDI determinants' literature, this could be achieved by participating more actively in regional trade agreement initiatives as it would increase the access to international markets its local and foreign producers enjoy. The country could push the Caribbean Community and Common Market (CARICOM) customs union members to implement more actively the necessary steps to establish a well-functioning common tariff zone in addition to potentiating the investment perception of the sub region. In addition, the government could envisage further free trade areas with large neighboring countries such as Brazil, Colombia or Venezuela. Improving the functioning of the domestic financial markets could also facilitate the creation of new business activities and generate employment opportunities.

While already quite good at the international level, there is scope to improve the quality and access to education in T&T. Secondary and tertiary education as well as research and development are important for maximizing FDI's full benefits, and the authorities may consider investing more in these domains. Expanding the knowledge base of the economy would facilitate the development of new activities and also make the country more attractive to foreign investors.

Finally, improving the business environment for both local and foreign investors is crucial to diversify the economy of T&T. Easing the access to finance, improving property rights, reducing the burden of bureaucracy and rationalizing further the tax systems are reforms that have been proven to attract more investments in new activities.

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7. ANNEX

ANNEX 1

Overview of Diversification and Industrialization Policies in T&T since the 1950's⁷

Since the mid 1950s T&T has applied diverse, and sometimes overlapping, industrial policies. These policies served as a means to promote industrialization but were precisely meant to promote diversification, targeting both production and exports. Interventions during these years were addressed both to specific sectors (vertical policies) as well as directed across new sectors and to the improvement of the business climate (horizontal policies). Over the years the Government did put forward initiatives aiming at fostering private sector development. In many cases the State even took the main role as a provider, and as a result such interventions have been subject to multiple interpretations, some seeing them as an active role that the Government played while others saw it as a limiting factor for private sector development. Diversification away from energy dependence has also mobilized significant Government efforts in the economic planning areas, although in T&T diversification has proven to pose significant challenges, partly due to the possible diagnosis of a Dutch disease or a natural resources curse but also partly due to other persistent underlying determinants limiting diversification. We review in what follows the main industrial policies implemented by the successive Governments of T&T.

- Industrialization By Invitation - model of Sir Arthur Lewis: 1958-1973

The government sought to follow the example of Puerto Rico and attract investors through the newly created Industrial Development Corporation (IDC) by providing investors with incentives, especially to exporting firms. The government implemented three five-year programs and was basically in control of economic planning. However, the model eventually failed because T&T could not compete with Puerto Rico and the benefits they granted to US investors.

- Import Substituting Industrialization (ISI): mid 1960s to early 1990s

To encourage the expansion of nascent industries, the main instrument of protection used was the “Negative List”. Importing products on that list would require a special license that was not easy to acquire. It was therefore implicitly imposed to buy local products, particularly for assembly type goods such as mattresses, radios, TVs, motor cars, home appliances, processed foods and furniture. During this period the IDC also started developing service industrial parks. After 1984 the “Negative List” was replaced by high import tariffs due to growing concerns regarding corruption practices associated with the granting of import licenses. By the 1990s the

⁷ Author's compilation based on Mohammed, A., Moya, R., Sookram, S., (2010) and Elías, Jaramillo, Rojas-Suárez (2006).

Government started bringing down the high import tariffs thereby signaling the end of the ISI model.

- State participation in the economy, state-led approach: between 1969- early 1980s

The Government policy focused on investment in heavy industry, especially the petroleum sector which was tremendously expanding due to Amoco's new oil discoveries off the east coast of Trinidad (1969), the discovery of gas reservoirs (1970) and the oil price increases after the Arab/Israeli war (1973). The Government used the oil revenues to increase its ownership in the economy in several sectors and diversify the industrial base of the economy.

- SOEs challenges, economic recession and structural adjustment: 1980s

The fall in the international price of oil and in domestic production caused a severe decline in government revenues, SOEs and Public Utilities increasingly accumulated debt and became a drain on the Treasury. These circumstances of lower income and higher debt led the economy to recession. At the time, a Task Force which was set up to help the economy recover indicated that the economy was still dominated by oil, dependence on imported food was heavy, diversification of the production and export structure was too low and levels of unemployment and wages were too high.

- Policy of industrial development based on the non-energy sector: since 1986

In order to avoid a new swing due to the dependence on oil.

- Privatization took place since 1987

The state moved away from taking command of the economy to establish a mixed economy with private sector involvement where the state should be a facilitator and not a producer.

- Resource Based Industrialization Or The Point Lisas Strategy: the 1990'S

The State focused on the development of the energy sector in areas such as natural gas, methanol, urea, ammonia, etc. This strategy is one where the value chain is extended by taking a natural resource and processing it further, rather than exporting it in its crude form. Government maintained control of all the energy companies and even established a national petroleum marketing Company. The strategy also involved public sector investment in the offshore sector and in Free Trade Zones so as to increase the national take from resource exploitation for distribution onshore. This strategy ensures that the onshore sector is tied to the vagaries of the offshore sector.

- Enterprise Development Policy 2001-2005

In 2002 the Government issued a policy statement declaring as a top priority the divestment of management and ownership of State Operated Enterprises, with preference given to local investors.

- *Green Paper on The Trinidad and Tobago Industrial Policy: 2007-2012*

The main strategy is to diversify the economy away from its dependence on the petroleum sector by developing non-oil manufacturing activities as well as services and the promotion and diversification of exports. Plans have been formulated in part through collaboration with private sector representatives. Diversification challenges are intended to be solved through Government institutions only if it could result in greater social and economical gains.

- *Vision 2020: 2002-2020*

The aim is “to lead the process of planning to develop a national strategy that would guide the country becoming a developed nation by the year 2020”. The Government is targeting seven sectors: Food and Beverage, Printing and Packaging, Merchant marine, Film, Music and Entertainment, Fish and Fish processing and Yachting; and Information Communication and Technology (ICT) was also included⁸. The specific Ministries would be outlining the policies and assigning for each selected sector or selected activity to be encouraged one main official institution that would be in charge of implementing the Productive Development Policy (PDP) as well as responsible of extracting information and cooperating with the private sector to build up a cluster structure. The new sectors were supposed to be linked with the non-oil sector and promote export led growth in that sector. Measures envisaged under the Vision 2020 reform include: creation of entrepreneurs, measures to ease restrictions on imports and exports of manufactured goods, E-commerce and E-business, reform of the public service, legislative reforms to increase trade and investment and to develop the financial and capital markets, human resource development, innovation and entrepreneurship.

- *Future of Vision 2020 is uncertain*

Vision 2020 seems to be no longer on the planning agenda given that a new government is now in power. The Budget Speech of the new Minister of Finance 2012 acknowledges that “other than the transition from an oil-based to a gas-based economy, the structure of the economy has not changed” and “economic activity in non-energy sector remains dependent on Government’s ability to transfer the energy sector revenue to domestic expenditure”. Government proposes a different approach to diversification of the economy, “this year we will find or explore new

⁸ The list of sectors selected by the government has been recurrent subject of debate and has been modified adjusting to the contributions of different actors that were subsequently building up on the existing diagnostic work. The long list of contributors to the list of targeted sectors includes: Investment Promotion Strategy Study for Trinidad and Tobago (TDI- TIDCO), June 1999; Vision 2020, Draft National Strategic Plan, 2001; Green Paper on the Trinidad and Tobago Investment Policy 2007-2012, Ministry of Trade and Industry; and Ministry of Trade and Industry, Business Development.

physical, financial and investment spaces within which we would like to see responses from the private sector, the labor movement and the state enterprises”, and regarding the energy sector “we are concentrating on the generation of high-value output to replace similarly-lost crude output and we are focusing on the several integrated energy-based manufacturing industries.”

ANNEX 2

Table 5: Summary Statistics

Variable	<i>Observations</i>	<i>Mean</i>	<i>Stand. Dev.</i>	<i>Min</i>	<i>Max</i>
Herfindhal Index	3641	.222018	.2105506	.0008	.9872
Access to Finance	4826	41.95048	40.19503	0	319.4609
Trade Openness	4461	79.63397	53.61374	0	460.6864
Population	5598	3.09e+07	1.16e+08	8051	1.34e+09
Human Capital	2720	84.62435	17.78343	13.25723	100
Quality of Institutions	3596	11.00431	3.514056	0	12
Real Exchange Rate	4982	1245.482	61432.19	1.93613	4300000
Inflation	4803	41.26022	379.1438	-34.57088	10896.2
Terms of trade	3752	101.3466	20.68765	25.63404	317.6712
Investment	4405	21.83702	9.807636	-36.70507	108.0246
FDI Inflows	5232	2.439106	5.391174	-24.60952	136.1931
PPP Real Income per capita	5157	10014.46	12210.22	140.0198	123263

ANNEX 3

In what follows, the average HH index of each comparison country groups is graphed against each potential diversification determinant (period 1980-2010 decomposed in six sub-periods).

