The Impact of Capital Flight on Investment and Growth in Trinidad and Tobago, 1971-2008

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Abstract
This study examines the impact of capital flight on investment and economic growth in Trinidad and Tobago over the period 1971-2008. It has been argued that capital flight can reduce domestic investment and dampen a country's economic growth. However these relationships are seldom examined for Caribbean countries. As such, we provide an empirical investigation into the causal linkage among these variables. We use two estimation techniques: first, short run and long run analysis is combined and explored with a Vector Error Correction (VEC) Model, and second, Generalised Method of Moments (GMM) estimation is utilized to augment the analysis. The results are in accordance with a priori expectations of negative relationship capital flight and domestic investment and the same for economic growth. This implies that policy aimed at reducing capital flight can have a positive effect on domestic investment and therefore lead to increased levels of economic growth in Trinidad and Tobago.

Keywords: Capital flight, Domestic investment, Economic growth

1. Introduction

Capital flight can be defined as "the transfer of assets abroad in order to reduce loss of principal, loss of return, or loss of control over one's financial wealth due to government-sanctioned activities" Epstein [2005][1]. These undeclared, undocumented or illicit transfers can deprive capital scarce economies of critical financial resources. This paper empirically investigates the possible negative relationship between capital flight and investment, and capital flight and growth. This is important because studies by Umoru [2013], Ndikumana and Boyce [2008], Ndiaye [2007], Schneider [2000], Henry [1996], Hermes et al [2002] and Ajayi [2000] have all highlighted the dangers of capital flight, and supported the notion that the loss of these resources would starve economies of the reserves and foreign exchange needed to reduce debt, increase domestic investment and support government expenditure and other productive measures such as manufacturing, health, education and public infrastructure that could contribute to increased economic growth and development.

Using the broad measure of capital flight, it is estimated that Trinidad and Tobago has lost an approximate nominal sum of US$32.4 billion or a real sum of US$33.3 billion from capital flight over the 38-year period 1971 to 2008[2]. Results further show that there were substantial increases in the amounts of capital flight in recent years, reaching a peak of US $5,564 million in 2008, despite the conventional wisdom of its 'imminent decline' post liberalization. These estimates reflect a serious loss which could be imposing constraints on domestic investment and the level of GDP. Given this context, it is critical to examine the potential consequences for such massive outflows. In spite of this, the empirical literature on the effects of capital flight on domestic investment and growth seem infinitesimal compared to the vast amount of literature and theoretical discussion on the determinants and estimates of capital flight. This divergence in the literature is considerably apparent for Caribbean countries such as Trinidad and Tobago as these relationships are seldom examined.

This paper attempts to fill this void in the literature, as such it provides a thorough econometric investigation of the above stated relationships. The findings provide for a clearer assessment and measure of the effects of capital flight from Trinidad and Tobago's increasingly liberalized economy, especially in the context of freer capital mobility, foreign tax havens, new innovative financial instruments and institutions. This study may also help answer surrounding questions relating to the country's absorptive capacity and improve the understanding of the underlying economic fundamentals that may be contributing to the relative stagnation of the growth rate in Trinidad and Tobago over the last several years.

This paper has four remaining sections. Section 2 reviews the literature on capital flight and its causal linkages to reduced levels in domestic investment and output. The methodology adopted is examined in section 3. First, the measurement of capital flight is briefly discussed and thereafter the methods for the econometric examination of capital flight and other controlled a priori determinants are presented. Section 4 illustrates and discusses the results. Section 5 summarizes the major findings, discusses the major implications of the results and concludes with some policy implications.

[1] The definitions of capital flight are discussed in an earlier paper (Salandy, 2013)
[2] Estimates of capital flight are taken from earlier paper and presented in Table A. 1

2. Impact of Capital Flight on Investment and Growth

Empirical studies by: Adesoye, Maku, and Atanda [2012] [3], Ndiaye [2007][4], African Economic Outlook [2012], Saheed and Ayodeji [2012] have all found negative a relationship between investment to capital flight. They find that as more capital is shifted abroad and invested or stored, the supply of capital available domestically is reduced, and the direct and indirect reductions in domestic investment levels are intensified. For example, in Nigeria and Angola the African Economic Outlook [2012] suggests that capital flight reduced investment by US$10.7 billion and US$3.6 billion per year, respectively in the period 2000 to 2008. The report also states that a reduction in the stock of capital flight in Africa by a quarter would have increased the ratio of domestic investment to GDP from 19% to 35% [Fofack and Ndikumana [2010], see African Economic Outlook [2012]]. Furthermore, Ndiaye's econometric estimates for countries in the Franc Zone, for the period 1970 to 2005, also indicate that capital flight significantly decreases domestic investment and postulates that a one dollar increase in capital flight lowers domestic investment by 4.5 cents.

This observed negative relationship between capital flight and domestic investment occurs through various channels. Firstly, capital flight leads to the loss of resources as capital is transferred abroad. This removal of domestically available resources directly alters the desire for domestic investment by individuals and thus the level of aggregate domestic investment. The lost resources transferred abroad also indirectly affect domestic investment as capital, which may be normally saved in the domestic financial system, is diverted externally. Thus, the resources of banks become smaller inhibiting the banks' ability and willingness to provide credit to the private sector to finance domestic investment [Saheed and Ayodeji [2012], Ndiaye 2012]. The lower levels of private sector credit lead to a more noteworthy point as longer term investments are generally enhanced by domestic forces rather than external sources [Adegbite and Adetiloye 2013].

Furthermore, the level of domestic investment is also reduced indirectly as capital flight also lowers the taxable income and government revenue [Khodaei 2012, Saheed and Ayodeji 2012]. This loss of the government's tax revenue is described as the "Tax-Depressing Thesis" as postulated by Forgha [2008] because it reduces available income for government investment. Ndiaye [2007] believes that this loss in public investment consequently affect private investment.

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[3] Adesoye, Maku and Atanda [2012] used model of the functional form $INV = F(CFL, INT, EXR)...(1)$ Where INV represents Investment, CFL represents capital flight, INT represents Interest rate, EXR represents Exchange rate

[4] Ndiaye [2007] used model of the functional form $INVP = F(INVP_{t-1}, \Delta FCRP_{t-1}, X, Y)...(2)$ Where INVP is the ratio of domestic investment to GDP (+), FCRP is the ratio of real capital flight to GDP (-), X represents the vector of macroeconomic control variables [Real GDP growth rate, the private sector credit to GDP ratio, and the rate of inflation], Y represents the vector of institutional control variables [quality of institutions, governance].

Another route identified by Nkurunziza [2012], Ndiaye [2007] and Collier et al. [2001] is the uncertainty and fear that capital flight causes. The existence of capital flight in an economy indicates the possibility of future economic failures such as; increases in the level of external indebtedness, taxes and exchange rate instability. This expectation of economic failures is evaluated as part of the cost to domestic investment and cause domestic investors to become more cautious reduces their levels of domestic investment [Nkurunziza 2012]. Considering it is an economic axiom that investment is a main component in the calculation of GDP, it is not implausible to conclude that its' decline reduces GDP [Lesotlho 2006, Dutta 2008, Adegbite and Adetiloye 2013] as it reduces the productive capacity for sustainable long term development [Ndiaye 2007].

Additionally theoretical and empirical research has identified capital flight as a direct contributor to the reductions in the growth rate of an economy. Supporting evidence for this negative causal relationship has been identified in several countries including Indonesia (Wahyudi and Maski 2012), Nigeria (Ajayi[5] 2012, Umoru[6] 2013, Osu, Amamgbo and Adeosun[7] 2012), Iran (Khodaei 2012), Cameroon (Forgha's[8] 2008), Philippine (Beja 2007) and other developing and transition countries (Gusarova's[9] 2009).

Estimates of this negative relationship show that South Africa lost an average of 9.2 per cent of GDP (US$13 billion in 2000), China lost 10.2 per cent of GDP (US$109 billion in 1999), Chile lost 6.1 per cent of GDP (US$4.7 billion in 1998) and Indonesia lost 6.7 per cent of GDP (US$14 billion in 1997) due to capital flight [Kapoor 2009 p.2]. This result is in line with the findings of Beja [2007]. His counterfactual calculation of the year-on-year potential output if the magnitude of capital flight was instead invested in domestic productive endeavours in the Philippine also suggest an average loss of US$ 432 million to US$ 864 million, or an average loss in growth rate of between 1 to 2.3 per cent between 1970 and 1999 in the Philippine's. Additionally Forgha's [2008] study indicates that a one per cent increase in capital flight retarded economic growth by

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[5] Ajayi [2012] used model of the functional form $GDP = F(\delta EXDEBT, DFI, CAB, \delta RES)...(3)$ Where:
GDP represents the Gross domestic product; Δexdebt represents the change in external debt; DFI represents the Direct foreign investment; δRES represents the change in External reserves; CAB represents the Current account balance

[6]Umoru [2013] used model of the functional form
$LnGDP = F(LnCFLT, LnRXRC, LnDOMV, LnPUDT, LnINDQ)...(4)$ Where GGDP is the growth rate of the Nigeria economy as measured by the growth rate of GDP, CFLT is capital flight, EXRC exchange controls, DOMV is the domestic investment, PUDT is public expenditure, INDQ is the level of industrial output

[7] Utilized Brownian motion process with drift that evolves according to an operational time instead of the physical time investigated herein via a class of distribution known as the Normal Inverse Gaussian (NIG) distribution to examine capital outflow

[8] Forgha [2008] used model of the functional form $\Delta LRGDP = F(\Delta CAPFL, \Delta TOT, \Delta POPG, \Delta INF)...(5)$
Where LRGDP represents log of real Gross Domestic Product, CAPFL represents capital flight, TOT represents terms of trade and INF represents inflation rate.

[9] Gusarova [2009] used model of the functional form $Y = F(X_{t-1}, CF_{t-1})...(6)$ Where Y represents per capital growth, X represents the vector of macroeconomic control variables [capital formation as a ratio of GDP, rate of inflation, growth in terms of trade and rate of population growth], CF represents real capital flight to GDP.

0.0617 per cent ceteris paribus. The trend in these findings are also established for 139 developing and transition countries for the period 2002 to 2006 by Gusarova's [2009]. Her study revealed that a one per cent increase in capital flight led to a fall in economic growth by 0.14 per cent for the period.

This reduction in the rate of growth occurs via the loss in resources, lower investment and reduction in productivity [Saheed and Ayodeji 2012, Kapoor 2009, Gusarova 2009, Forgha 2008, Ndiaye 2007, Debajyoti et al 2006]. As capital flight increases the transfer of domestic resources abroad the level of demand for goods and services and thus domestic production is reduced. Additionally, the decline in the taxable income reduces the potential revenue generating power of the government [Forgha 2008, p.78] and the resources to finance government expenditure thus the rate of growth in an economy. Capital flight also undermines sustainable development by increasing the dependence on external resources such as aid that are needed to replace the gap left by the fleeing of domestic capital [Kapoor 2009, p.3]. In particular, the inability of domestic firms to repay foreign debts may force them to lay off workers, causing unemployment and a further decrease in real output.

Growth is also reduced as the capital to labour ratio is reduced by capital flight. Gusarova [2009] and Collier et at [2001] shows that as the capital to labour ratio declines so do the productivity of capital and the levels of output. Debajyoti et al [2006] also support this finding and add that the additional effects of capital flight on other physical effects such as redistributive taxation and human capital investments also affect long term growth. The African Economic Outlook [2012] report states, "If flight capital was saved and invested in the domestic economy of the country of origin it would increase income per capita and help to reduce poverty."

3. Methodology

3.1 Data

Capital flight estimates for Trinidad and Tobago were previously calculated using the Residual or Broad Estimate of capital flight adjusted for Trade Misinvoicing and inflation for the sample period, 1971-2008. This common measure is supported by several economists including Cerra, Rishi, and Saxena [2005], Schneider [2000], Ajilore [2010] and Henry [1996] and calculated as shown by the equations below.

$$KF = KF^* + MIS \quad \ldots(1)$$

$$KF = [\Delta DEBT + NFDI - CAD - \Delta FR] + [\text{Export Misinvoicing} + \text{Import Misinvoicing}] \quad \ldots(2)$$

$$RKF = KF/PPI \quad \ldots(3)$$

Where:

KF is estimated capital flight adjusted for trade misinvoicing, KF* is the Residual or Broad Estimate of capital flight, RKF is the estimate of capital flight adjusted for inflation using the United States producer price index (PPI) for 2000 as the deflator, Δ denotes change, ED is stock of gross external debt reported by the World Bank, NFDI is the net foreign investment, CAD is the current account deficit and FR is the stock of official foreign reserves.

The data for the dependent variables; domestic investment [INV] and logged real gross domestic product [RGDP] were sourced from the Central Statistical Office of Trinidad and Tobago. Domestic investment was measured by lagged real gross capital formation adjusted and output measured by GDP and both variables adjusted for inflation using the United States producer price index (PPI) for 2000. Significant micro, macro and financial factors also sourced from the CSO and the Central Bank of Trinidad and Tobago were utilized as control variables for the functional form of each dependent variable[10] to empirically identify and quantify the impact of capital flight as a determinant of domestic investment and growth in Trinidad and Tobago. The vector of control variables utilized for the parsimonious domestic investment model was real government expenditure (RGE), the growth rate of GDP (RCGDP) and interest rate differential (RD). The a priori expectations ceteris paribus are as follows:

- Real government expenditure [RGE] positively affects domestic investment. It accounts for the fiscal policy expansion or expansion of domestic investment.

- Growth rate measured by change in real GDP [RCGDP] is used to account for the effects of macroeconomic stability and growth on investment, as low growth can signal lower expected returns on domestic investment and thus initiate lower levels of domestic investment.

- Past levels of the change in GDP [$RCGDP_{-1}$] measured by lagged changes in real gross domestic product was used as an indicator for the investment climate and its effect on current investment decisions.

- The real interest rate differential [RD] measured as the gap between domestic and foreign real rate where; $RD = (\text{US Tbill rate} - \text{US rate of inflation}) - (\text{T Tbill rate} - \text{T rate of inflation})$ will account for the proposed negative effects of the cost of capital to changes in domestic investment as lower domestic rates provide the incentive for foreign asset holdings.

On the other hand the parsimonious GDP model comprised of domestic investment (INV) the terms of trade (TOT), population growth (POP), and the real exchange rate (RER) as control variables. The a priori expectations ceteris paribus are as follows:

- Logged domestic investment [LINV] measured by logging INV which is a component of GDP, and has a positive impact on growth.

- The population growth [POP] is used as proxy for the level of human capital which positively affects growth.
- The real exchange rate [RER] measured as $e \times \frac{PPI_{US}}{CPI_T}$ accounts for the uncertainty created by exchange rate overvaluation which make the domestic environment unattractive for investment.

[10] A few control variables (only subsets of these were used simultaneously in the regression) are used in the a priori functional form of investment and growth due to the limited number of annual data points. Despite the possibility of omitted variables the economic impact and significance of capital flight on investment and growth would be derived from the econometric results.

- The terms of trade [TOT] account measured as the country's export prices in relation to its import prices control for the positive effects on GDP.

3.2 Model Specification and Regression Analysis

To ensure that the regression analysis on the proposed models did not produce spurious results, it was necessary to analyse the behavior of the time series data and determine the stationarity and the order of integration I(d). The order of integration I(d) or the stationarity of all the variables were determined using the Augmented Dickey Fuller and Phillips Perron tests. The I(1) variables were then examined for cointegrating relationships established by the Unrestricted Cointegration Trace test and Max Eigenvalue statistics using the Johansen cointegration test. The appropriate lag length[11] for the Johansen cointegration test was determined using the SIC from the lag length selection test[12]. With established cointegrating vectors the impact of capital flight on domestic investment, and on the level of GDP were then tested using Vector Error Correction Model (VEC) of the form 4 and 5 eliminating explanatory variables with the lowest t-ratio and then resubmitting the remaining variables.

$$\Delta INV_t = \alpha_0 + \alpha_1 \Delta RKF_t + \alpha_2 \Delta RKF_{t-1} + \alpha_3 \Delta X_t + \lambda ECT_{t-1} + \varepsilon_t \ldots (4)$$

$$\Delta LRGDP_t = \beta_0 + \beta_1 \Delta RKF_t + \beta_2 \Delta RKF_{t-1} + \beta_3 \Delta X_t + \gamma ECT_{t-1} + \varepsilon_t \ldots (5)$$

Where:
α_0 / β_0= constant
α_i / β_i = coefficients of each determinant
X= the vector of macroeconomic control variables[13]
ECT = the error correction term[14] and provides evidence of the long-run relationship and links the long run relationship between cointegrated vectors with the short-run adjustment mechanism by restoring equilibrium in the presence of any disequilibrium shocks.
LRGDP= logged values of RGDP
ε = error term

Afterwards, GMM estimation was applied to circumvent any bias that may have occurred due presence of heteroskedasticity and to correct for endogeneity problems [Wooldridge 2001][15]. The

[11] Keeping in mind too many lags could increase the error in the forecasts and too few could leave out relevant information

[12] A simple comparison of the penalties for the Akaike Information Criterion [AIC], Schwarz Bayesian Criterion [SC] and Hannan-Quinn Information [HQ] shows that, if they disagree, the AIC would choose the largest model, the SC the smallest (less than 120) and the HQ in between. [Ayalew et al 2012]

[13] This study does not consider all the potential factors determinants of investment and growth but utilizes several macroeconomic factors as control variables for the functional form

[14] ECT represents one period lagged error correction term captured from the co-integrated variables and must be negative and statistically significant

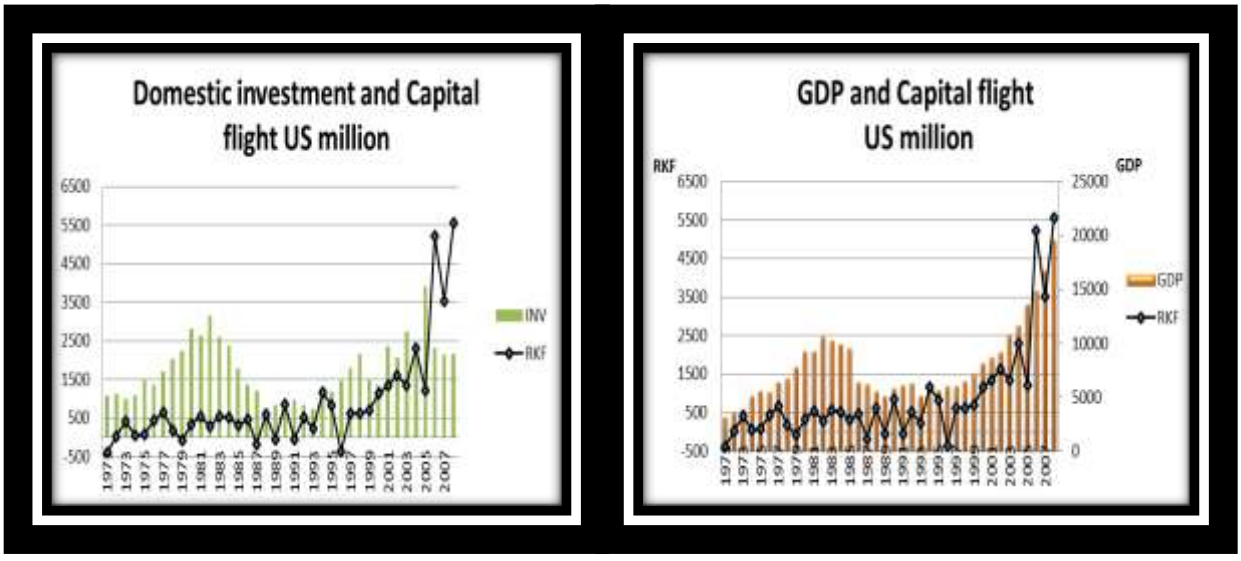
GMM model also corrects for functional error of measurement [Umoru 2013] and operated as a robustness test.

Residual diagnostics were also performed on the accepted best-fit model to ensure that the null hypothesis of no serial correlation, homoscedasticity and normality was accepted at the 5% level using the, ARCH LM, Breusch-Godfrey and Jarque-Bera tests respectively. The F test also ensures that the observed variables jointly influenced capital flight, while the correlation matrix is utilized to ensure this result was not affected by high levels of multicollinearity between variables. Stability was of the model was then determined with the use of the Ramsey test (OLS only) and the CUSM test to ensure that residuals were stable and its cumulative sums were located within the two standard deviation bands. In addition to these tests the significance of the GMM model was verified with the use of the Hansen J statistic (minimized value of the objective function divided by the number of observations) to ensure validity of the model specification and instruments. The J-statistic is independently calculated in Eviews with Chi-square distribution for the degrees of freedom equal to the number of over identifying restrictions.

4. Results and Discussion

Looking at the raw data in Figure 1 below, one observes a fluctuated trend in the levels of real domestic investment, real gross domestic product and real capital flight. There is also a notable disparity in the later years between the levels of real capital flight and real domestic investment. This seemingly large relative difference between these two variables especially in the latter years may signify the existence of an inverse relationship. Conversely, the comparison of the real data for capital flight and real gross domestic product does not reproduce such an apparent relationship.

FIGURE 1 SHOWING THE RELATION BETWEEN INV AND RGDP



[15] "Cragg (1983) was the first to discover that one can improve over ordinary least squares in the presence of heteroskedasticity and serial correlation of unknown form by applying generalized method of moments." Wooldridge [2001, p.90]

Further exploration of the causal relationships with the Granger Causality test (refer to Table 1) indicates a significant bi-directional causal relationship between the level of real capital flight and the level of the real gross domestic product and only one-way Granger causality from real domestic investment to real capital flight. The Granger Causality accepts the null hypothesis that real capital flight does not Granger Cause the real domestic investment at an 87% level of significance, indicating that real capital flight does not Granger cause real domestic investment.

TABLE 1 GRANGER CAUSALITY TEST RESULTS

Null Hypothesis:	**Obs**	**F-Statistic**	**Prob.**
DRKF does not Granger Cause DRGDP	35	7.41972	0.0266
DRGDP does not Granger Cause DRKF		14.4115	0.1036
DRKF does not Granger Cause DINV	35	1.52327	0.8704
DINV does not Granger Cause DRKF		6.83375	0.0547

Source: E Views Results

Additional examination of the raw data reveals that the two dependent variables (INV, RGDP), as well as the main independent variable (RKF) and all the respective control variables are non-stationary. All examined variables are characteristic of one unit root [I(1)] and thus become stationary after first differencing (refer to Table 2).

TABLE 2 SHOWING RESULTS FOR STATIONARITY OF VARIABLES

VARIABLES	AUGMENTED DICKEY FULLEY				PHILLIPS PERRON				**Order of integration**
	Level		First Difference		Level		First Difference		
	Intercept	Trend	Intercept	Trend	Intercept	Trend	Intercept	Trend	
INV	-3.22	-1.79	-6.98*	-6.88*	-1.90	-1.91	-6.90*	-6.81*	**I(1)**
RGDP	-0.47	-0.82	-4.37*	-4.32*	-1.05	-1.47	-4.54*	-4.48*	**I(1)**
RGE	-1.30	-1.36	-5.09*	-5.02*	-1.73	-1.80	-5.21*	-5.15*	**I(1)**
RCGDP	-2.86	-2.88	-8.31*	-8.19*	-2.77	-2.79	-8.65*	-8.53*	**I(1)**
RD	0.023	2.405	-5.22*	-4.90*	-1.76	-2.53	-5.22*	-5.12*	**I(1)**
PPSC	-1.70	-0.78	-5.12*	-5.55*	-1.73	-0.52	-5.15*	-5.64*	**I(1)**
POP	-0.61	-1.32	-5.82*	-5.59*	-1.29	-1.92	-2.72**	-2.78	**I(1)**
TOT	-1.21	-1.40	-4.70*	-4.01*	-1.41	-1.62	-4.72*	-4.64*	**I(1)**
RER	-1.73	-2.24	-6.20*	-6.11*	-1.73	-2.29	-6.20*	-6.11*	**I(1)**

* significant at 1% **significant at 5%

The regression results for the INV and RGDP models reported in Tables 3 and 4 respectively, reveal that capital flight reduces the level of real domestic investment, and the real gross domestic product in Trinidad and Tobago irrespective of estimation technique. Firstly the results for the INV models will be discussed, followed by the RGDP models.

TABLE 3 DETERMINANTS OF INV: VEC AND GMM ESTIMATION

3A VEC Dependent Variable: INV		3B GMM Dependent Variable: INV	
Constant	48.48655 (0.883062)	**Constant**	50.16892 (0.3563)
D(RKF)	-0.298244 (-5.132061)	**D(RKF)**	-0.358324 (-4.070197)
D(RGE)	0.702847 (3.171911)	**D(RGE)**	0.731763 (3.775360)
D(RCGDP)	50.63376 (3.467691)	**D(RCGDP)**	26.78318 (4.201610)
D(RCGDP(-1))	-54.85011 (-3.567964)	**D(RKF(-1))**	-0.174359 (-4.091724)
ECT	-0.581847 (-4.808103)		
DIAGNOSTICS		**DIAGNOSTICS**	
R^2	0.69	**R^2**	0.47
Adjusted R^2	0.64	**Adjusted R^2**	0.40
Functional Form F-test	13.23 [0.00]	**J-Statistic (p value)**	0.53
Serial Correlation	0.01	**Durbin-Watson stat**	2.39
Heteroskedasticity	0.53		
Normality	0.27	**Normality**	0.09
Ramsey RESET /CUSM test	Within bands	**Ramsey RESET test**	Within bands

t-ratios in parentheses ( )

The VEC model for INV in Table 3A consists of 1 cointegrating vector among the I(1) variables [INV, RKF, RGE, RCGDP, RD]. This cointegrating vector was established by the Johansen Cointegration test (see Table A.2) with a lag length of 1 as specified by the SC lag length criterion. The long run co-integrating equation or error correction term (ECT) is presented linearly by equation 6 below. The coefficient of the ECT highlighted in Table 3A is statistically significant and has a negative coefficient of -0.582. This 58.2% adjustment rate is high and enables the cointegrating variables to realign quickly to the equilibrium point in the long run.

INV = 1.00578 -0.46032RKF + 1.41077RGE + 197.74244RCGDP – 14.9435RD…(6)

The VEC result is in accordance with the stated a priori expectations, as it confirms the significance of real capital flight as a determinant of real domestic investment both in the short run and in the long run. The real capital flight variable has a coefficient of -0.46 in the long run and -0.298 in the short run. This result exhibits the inverse relationship between real capital flight and real domestic investment in both time periods. When capital flight increases by one dollar, investment falls by $0.46 in the long run and $0.3 in the short run holding all other factors constant. Furthermore, the results reveal a positive influence of real government expenditure and real changes in the growth rate on real domestic investment in the long run and the short run. Conversely, the interest rate differential has an observed negative impact in both time periods.

The GMM estimation technique addressed any potential endogeneity problems and its results indicated in Table 3B concurs with the VEC results indicated in Table 3A. The result of the GMM INV model indicates a one dollar increase in real capital flight reduces real domestic investment by $0.36 ceteris paribus in the short run. The GMM output also highlights that a one dollar increase in real capital flight in the previous year reduces the level of real domestic investment by $0.17 in the current year. The controlled variables also retain the same signs.

TABLE 4 THE DETERMINANTS OF REAL GDP: VEC AND GMM ESTIMATION

4A VEC Dependent Variable: RGDP		**4B GMM Dependent Variable: RGDP**	
Constant	0.020441 (1.571854)	**D(TOT)**	0.005762 (2.257706)
D(TOT)	0.004799 (5.066181)	**D(RER)**	-0.157736 (-4.498577)
D(RER)	-0.160480 (-5.579878)	**D(LINV)**	0.264186 (3.604983)
ECT	-0.099120 (-5.795502)	**D(RKF(-1))**	-0.000107 (-3.280172)
DIAGNOSTICS		**DIAGNOSTICS**	
R^2	0.64	**R^2**	0.67
Adjusted R^2	0.60	**Adjusted R^2**	0.60
Functional Form F-test	19.14 [0.00]	**J-Statistic (p value)**	0.34
Serial Correlation	0.14	**Durbin-Watson stat**	2.12
Heteroskedasticity	0.26		
Normality	0.47	**Normality**	0.72
Ramsey RESET /CUSM test	Within bands	**Ramsey RESET test**	Within bands

t-ratios in parentheses ( )

The VEC model for RGDP is shown in Table 4A. For an optimal lag length of 2 the Johansen Cointegration test established at least one co-integrating rank (shown in Table A.3), among the I(1) variables [LRGDP, RKF, TOT, POP]. This long run co-integrating equation or error correction term (ECT) is presented linearly by equation 7 below. The -0.099 coefficient of the ECT highlighted in Table 4A is significant and negative indicating long run convergence. However, this 9.9% adjustment rate is relatively low and signifies a slow realignment to long run convergence.

LRGDP = 7.45996 -0.0002RKF + 0.0187TOT + 0.30764POP …(7)

The VEC result conforms to the main theoretical hypothesis of the study, and indicates that real capital flight has an adverse effect on the real gross domestic product in the long run. The small coefficient of -0.0002 shows that holding all other factors constant in the long run a one dollar increase in capital flight reduces the real gross domestic product by 0.02%. Real capital flight has an insignificant impact on real gross domestic product in the short run and is thus eliminated

from the final model shown in Table 4A. Furthermore, the VEC RGDP results reveal that the terms of trade and the population growth positively impacted the real gross domestic product in the long run. In the short run the terms of trade maintained its positive influence but the real effective exchange rate had an adverse impact on the real gross domestic product.

The GMM RGDP model in Table 4B also indicates the same significant adverse impact of real capital flight on real gross domestic product. The estimated impact is given by the coefficient -0.0001 indicating that a one dollar increase in real capital flight reduces the real gross domestic product by 0.01%. The GMM estimation reveals a negative impact of real exchange rate and the positive impact of real domestic investment and the terms of trade on the real gross domestic product. The positive effect of domestic investment on the level of real gross domestic product also substantiates the negative effect between real capital flight and the level of real gross domestic product as a result of the transitive law.

The results presented in Table 3 and 4 also pass diagnostic tests and are statistically acceptable. The results of the regressions are significant and the residual and stability test are sustained and accepted. The average R^2 for the regressions are 0.58 and 0.66 for real domestic investment and real gross domestic product respectively. The F statistics indicate a substantially strong model with significant explanatory usage. The p-value of the J statistics is also satisfactory for both GMM models and lead to the acceptance of the instruments.

5: Policy Recommendations and Conclusion

Capital flight is one of the fundamental problems of developing countries. Previous studies have documented the importance capital flight and have advocated the dangers of capital flight and supported the notion that the loss of these resources would starve economies of the reserves and foreign exchange needed to reduce debt, increase investment and support government expenditure and other productive measures that could contribute to increase economic growth and development. It has been observed that capital flight has increased substantially over the 20th century in Trinidad and Tobago. This recognised trend of capital flight from Trinidad and Tobago and the substantial increase in the 20^{th} century contradicts the conventional wisdom of neoclassical theorists, but does not certify its actual impact on domestic investment and growth. This study was undertaken to empirically investigate the impact of capital flight on domestic investment, and on the levels of output in Trinidad and Tobago over the period 1971-2008.

The economic arguments against capital flight from Trinidad and Tobago are conclusively supported by the econometric results of this study. These results remains valid and viable even after verifying for the contribution of other macroeconomic variables and utilizing two methods of estimation (VEC and GMM). The results cannot be ignored; the financial haemorrhage of capital flight has been proven to reduce domestic investment and growth. In an era where growth and development is a national objective this loss of investment and reduced output can further impair the economy as social sectors can be directly and indirectly affected.

These results must be seriously considered and future levels of capital flight and levels of foreign currency accounts must be monitored especially in an international financial system which is increasingly deregulated, interconnected and sophisticated. The probability of these

consequences worsening in the face of financial crisis and global changes is critically important for the future of economic policy and regulation especially for a country such as in Trinidad and Tobago. Change is needed to ensure that capital flight cannot destabilise the financial markets. Trinidad and Tobago must try and respond to this instability caused by capital flight to protect the economy from external shocks owing to its low export diversification and strong dependence on the oil and natural gas sector.

The protection of the Trinidad and Tobago economy from capital flight will protect the level of domestic investment which is financed through personal savings or bank borrowing which can hamper this already thin financial market. The domestic investment environment must also be evaluated because capital flight does not only indicate poor regulative measures but also an unsustainable investment environment. If the profitable investments cannot be maintained or found locally, investors must seek sources externally to improve their portfolio. Non-restrictive measures such as the promotion of domestic investment should also be considered because confidence in the economy must be re-invigorated to increase the current levels of domestic investment and to curb the influence of capital flight. Additionally capital management techniques may need to be factored to restrict the continuous outflow of capital from such a small developing economy.

To conclude growth and investment are too key areas of concern for any economy. There is a need to reduce the country's vulnerability to capital flight; these lost funds must be channelled into productive areas and warrant more study on its linkages to income inequality as the costs to the poorer citizens must be considered.

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Appendix

Table A. 1 Showing Capital Flight and Real Adjusted Capital Flight 1971-2008 (US $ Million)

YEAR	KF*	RKF	KF/GDP
1971	-32	-381	-12
1972	-28	36	1
1973	74	417	11
1974	77	62	1
1975	2	78	1
1976	149	434	8
1977	159	660	10
1978	-3	170	3
1979	-53	-70	-1
1980	197	346	4
1981	336	542	6
1982	-66	280	3
1983	245	557	5
1984	239	529	5
1985	376	320	3
1986	426	457	7
1987	-198	-174	-3
1988	367	608	11
1989	5	-53	-1
1990	806	856	15
1991	-93	-61	-1
1992	308	514	8
1993	34	238	5
1994	873	1164	21
1995	808	825	15
1996	-257	-362	-6
1997	178	625	10
1998	18	627	10
1999	513	707	10
2000	911	1152	14
2001	810	1356	16
2002	729	1618	18
2003	1399	1350	13
2004	2558	2315	20
2005	1439	1217	9
2006	6480	5221	35
2007	4578	3522	21
2008	8008	5564	28
TOTAL	**32,371**	**33,265**	**323**

Source: Author's computations from previous paper

Table A. 2 Showing Johansen-Juselius test of Cointegration for Domestic Investment

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None*	0.663516	39.21139	33.87687	0.0105
≤ 1	0.497939	24.80522	27.58434	0.1090
≤ 2	0.235932	9.687523	21.13162	0.7734
≤ 3	0.663516	6.290908	14.26460	0.5762

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Table A. 3 Showing Johansen-Juselius test of Cointegration for GDP

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None*	0.627224	34.53720	27.58434	0.0054
≤ 1	0.385200	17.02605	21.13162	0.1708
≤ 2	0.084177	3.077644	14.26460	0.9414
≤ 3	0.006326	0.222097	3.841466	0.6374

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values