

# **Economic Volatility and Growth in Trinidad and Tobago**

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# Major Objective of Paper

- To determine for Caribbean countries whether the relationship between volatility and growth is positive or negative.
- To determine how volatile Trinidad and Tobago economy is relative to CARICOM peers.
- To estimate the extent to which the terms of trade is a contributor to volatility in Trinidad and Tobago.

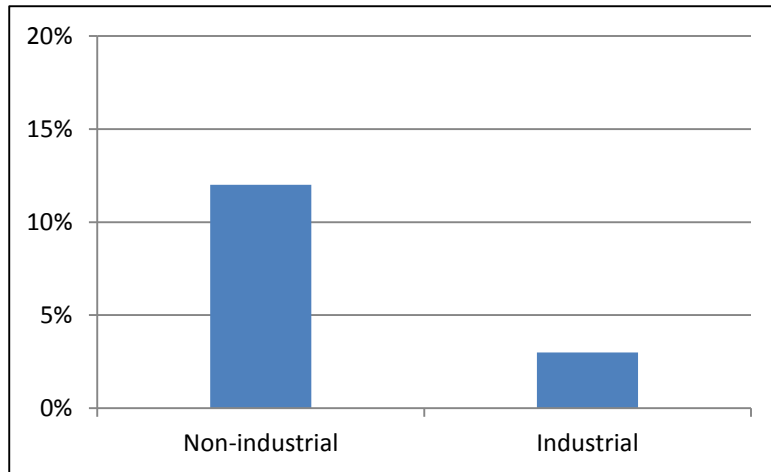
# The Relationship between Volatility and Growth

- **Negative:** Ramey and Ramey (1995); Hausmann and Gavin (1998)
- **Positive:** Lee (2010); Jiranyakul (2011); Caporale and McKiernan (1998); Grier and Tullock (1989)
- **Ambiguous:** Imbs (2002); Dejuan and Gurr (2004)

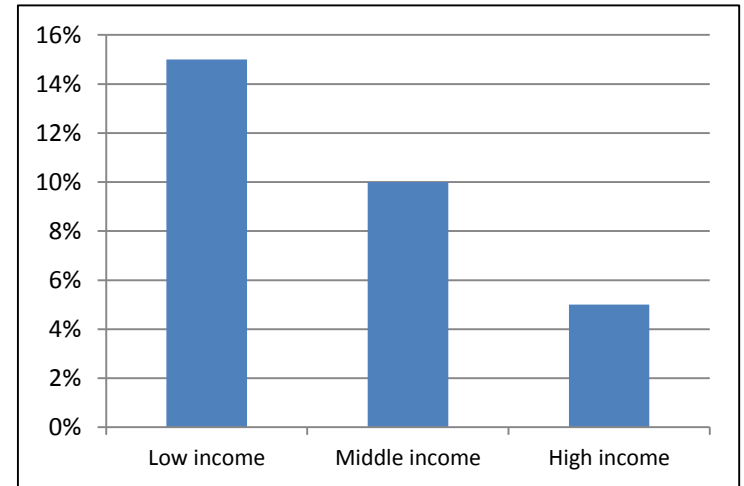
# Aggregate Volatility: Developed and Developing Countries

1975 – 2005

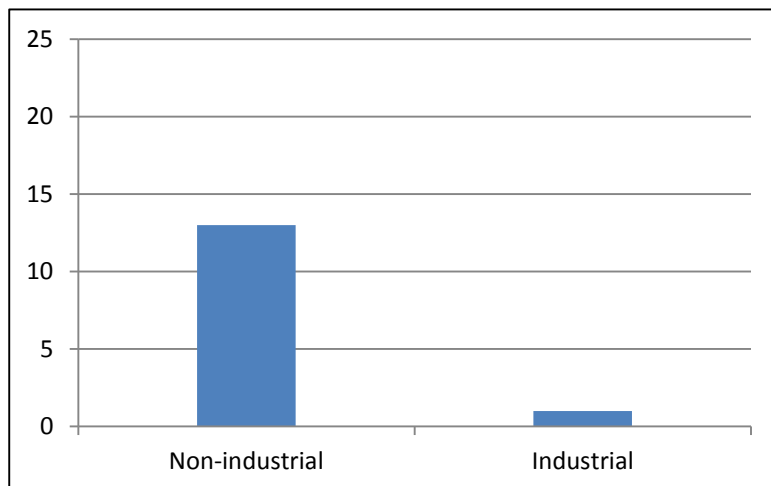
## Output volatility



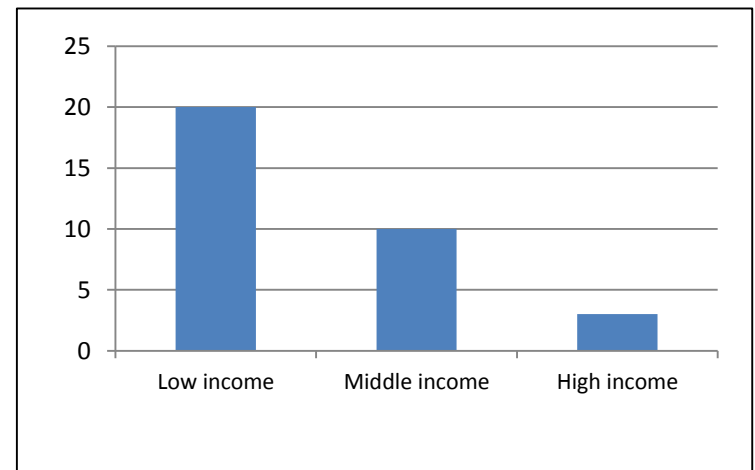
## Output volatility



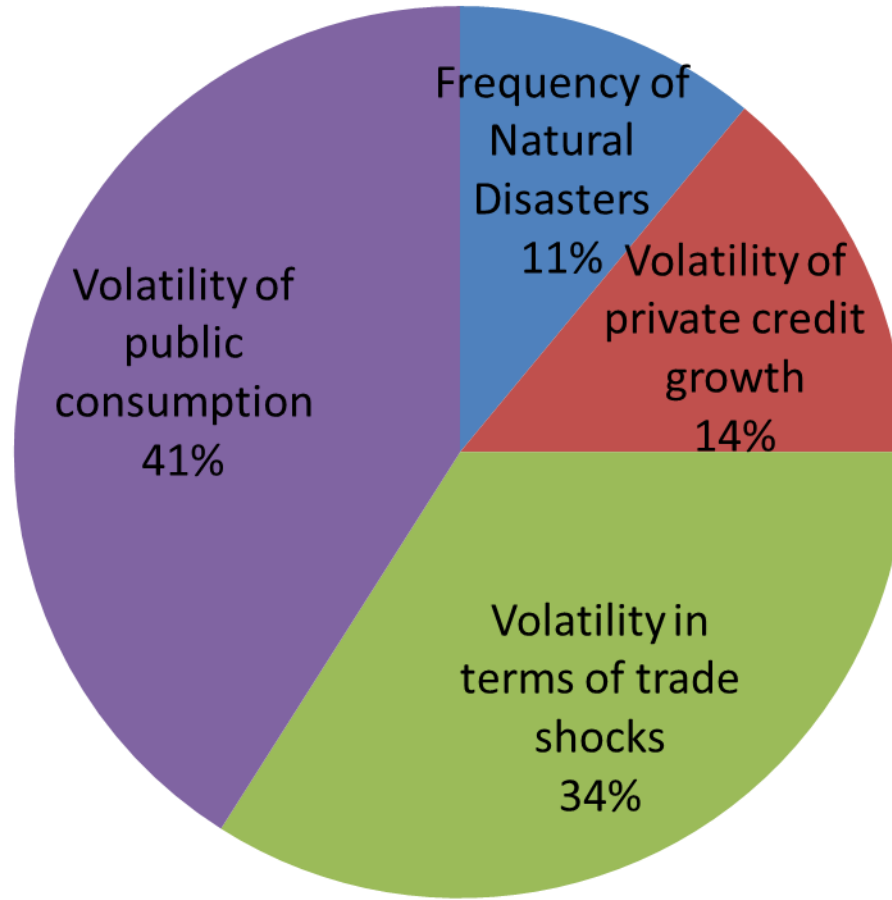
## Shock frequency



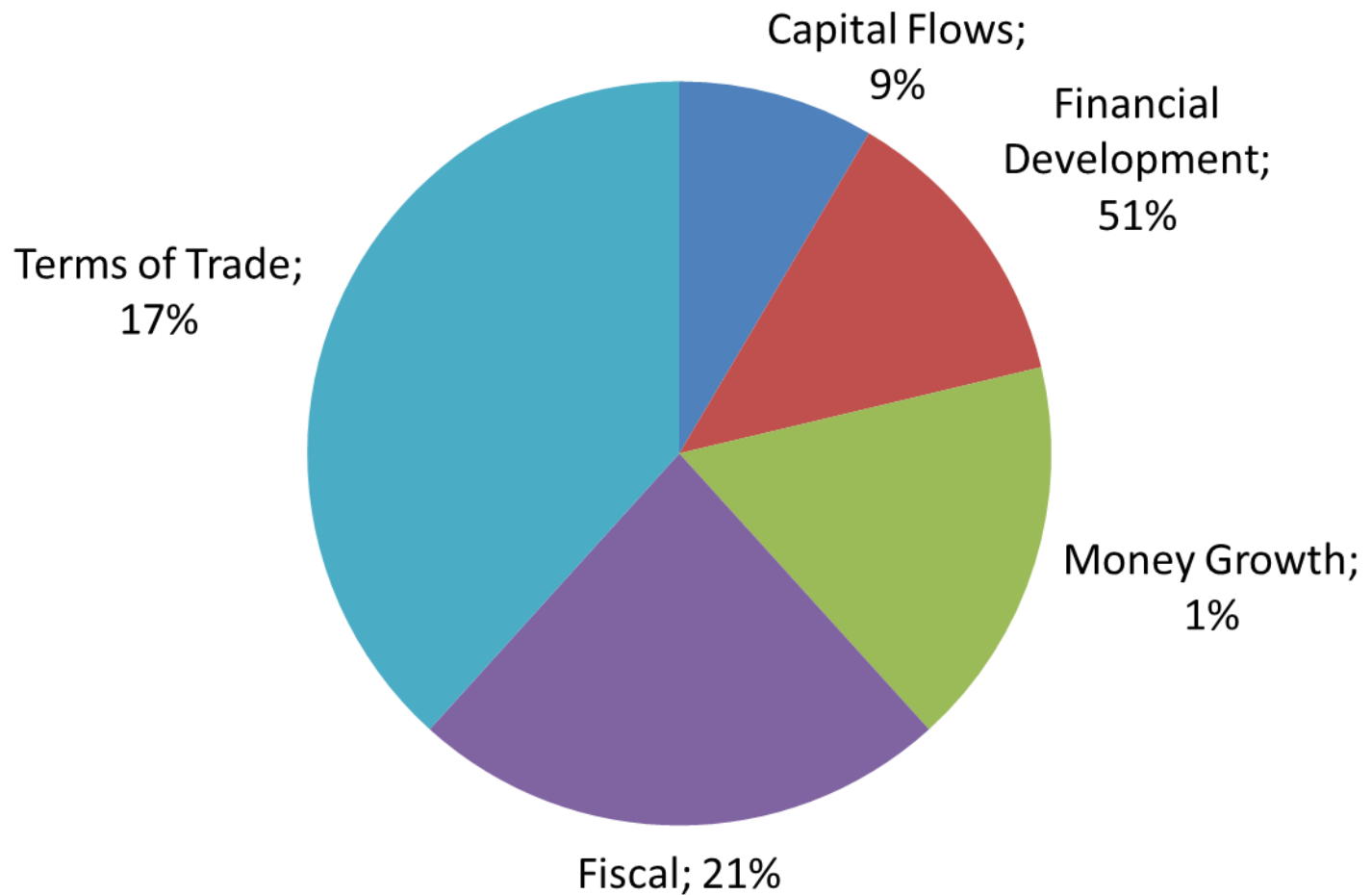
## Output drop frequency



# World Bank Caribbean Economic Overview 2002



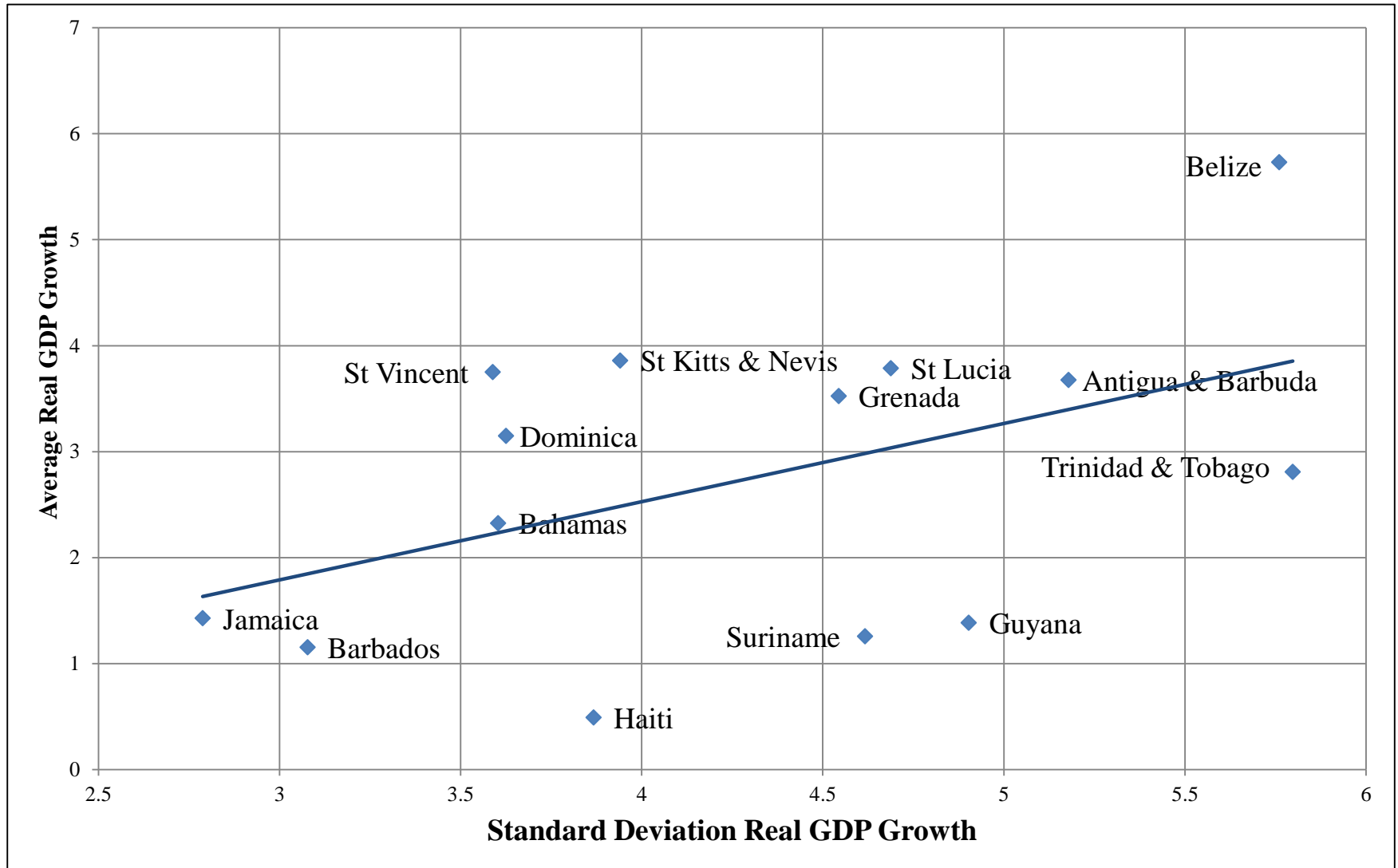
# Change in excess volatility in Developing Countries between 1995-2005 Perry (2009)



# Triggers of Financial Crises in Advanced, Emerging and Low Income Countries

- Low income countries more likely to experience terms of trade shocks: 17.2 per cent of years.
- Reversal of Capital flows for low income countries was next at 15.4%
- Other sources was between 1.8% to 3.2%.

# Volatility over last three decades in CARICOM





# Methodology

- GARCH (1,1) model
- Quarterly observations
- Period of Study: 1992Q1 to 2011Q2 (78 observations).

# GARCH/ARCH Model

- The GARCH effect is the weighted average of past squared residuals,
  - but it has declining weight that never go completely to zero.
- The ARCH model is the variance of the current error term or innovation
  - as a function of the actual sizes of the previous time periods error terms.

# GARCH (1,1) Model

- $\sigma^2 = \alpha_0 + \alpha_1 \varepsilon_{t-1}^2 + \beta_1 \sigma_{t-1}^2$   
where  $0 \leq \alpha_1, \beta_1 \leq 1, (\alpha_1 + \beta_1) < 1$

- The one-period ahead forecast is denoted by:

$$\sigma_{t+1}^2 = \alpha_0 + \alpha_1 \varepsilon_t^2 + \beta_1 \sigma_t^2$$

- For the multi-period forecast we have

$$\sigma_{t+1}^2 = \alpha_0 + (\alpha_1 + \beta_1) \sigma_t^2 + \alpha_1 \sigma_t^2 (\varepsilon_t^2 - 1)$$

- Hence the unconditional variance (volatility) is given by:

$$\sigma_1^2(\ell) \rightarrow \frac{\alpha_0}{1 - \alpha_1 - \beta_1} \text{ as } \ell \rightarrow \infty$$

# GARCH Model

- The GARCH model examines the evolution of volatility by comparing weights on the past shocks in relation to recent shocks.
- It considers the speed at which shocks dissipate.
- It can incorporate extreme events “Black Swan Events”.

# Results

- GARCH/ARCH model was found to be normally distributed.
- The unconditional variance is  $\alpha + \beta = 0.89$  suggesting a fair degree of persistence of the terms of trade.
- Alpha shocks are significant and larger than beta shocks.
- This suggests that the terms of trade shocks take a little while to dissipate.

# Conclusion

- The results contradict the orthodoxy emanating from industrialised countries that
  - there is a negative correlation between volatility and economic growth.
- The relationship for the CARICOM was found to be on the contrary.
- We found that in Trinidad and Tobago the relationship was positive.
  - The positive relationship may stem from the fact that the country is an energy exporter.