# Can a Taylor-type rule predict the response of the short-term interest rate to short-term macroeconomic disturbances in an energy based economy with a managed exchange rate?

**Preliminary**

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# Rational for Study

- To see whether the policy rate set by the monetary authorities in Trinidad and Tobago can be obtained from a simple rule. This improves transparency and consistency, minimise variability of inflation and output, and allows central banks to incorporate limited knowledge of a narrow set of variables. (Svenson 2005, Haung (2003)
- Examines whether the short-term interest rate can be a useful instrument for closing the monetary transmission gap between the final target and the operating instrument.
  - Economy is small and open.
  - a managed exchange rate where government is a near monopoly supplier of foreign currency.
- To investigate which measure of inflation best lends itself to tracing the path of the policy rate.

# About the Taylor Rule

- Taylor (1993) rule attempts to trace the path of the short-term policy rate through a simple rule. Policy rate is modelled as a function of the inflation gap and output gap.
- Taylor rule was originally developed for a closed economy with a flexible exchange rate.
- Later literature sought to examine the rule in relation to an open economy. ((see for example Batini and Levine (2007), Clarida (2007) and Gali and Monacelli (2005,).
- The Taylor rule was augmented by including the exchange rate.
- Much of the literature has sought to incorporate the Taylor rule in a dynamic stochastic general equilibrium framework and apply callibration to minimise the loss function on inflation and output gap. (Galí and Monacelli (2005), Batini and Levine (2007))

# Specification of the open economy Taylor rules

- ρ  captures the degree of smoothing. It indicates a gradual adjustment of the policy rate by the monetary authority. This is done to
  - Avoid frequent policy reversals
  - Minimise volatility of policy instrument.
  - Account for a cautious approach given uncertainty about parameter values.
  - Steer private sector in the direction central bank desires.
- Monetary authorities are assumed to take a backward view by setting the policy rate based on past inflation. That is, it is based on information they already have.
- For stabilisation, the coefficients of inflation and the output gap must be greater than unity and zero respectively.

# Specification of Alternative Taylor-Type Hypotheses

1.0 $i_t = \rho i_{t-1} + (1-\rho)(\alpha + \beta_\pi \pi_{t-1} + \beta_y Y_{t-1}) + \varepsilon_t$

2.0 $i_t = \rho\, i_{t-1} + (1-\rho)(\alpha + \beta_\pi \pi_{t-1} + \beta_y y_{t-1} + \beta_e e_t) + \varepsilon_t$

3.0 $i_t = \rho i_{t-1} + (1-\rho)\left(\alpha + \beta_\pi \pi_{t-1} + \beta_y Y_{t-1} + \beta_T \frac{P^{¿}}{P}\right) + \varepsilon_t$

4.0 $i_t = \rho i_{t-1} + (1-\rho)(\alpha + \beta_\pi \pi_{t-1} + \beta_y Y_{t-1} + \beta_i i^{¿}_t) + \varepsilon_t$

5.0 $i_t = \rho i_{t-1} + (1-\rho)(\alpha + \beta_\pi \pi_{t-1} + \beta_y Y_{t-1} + \beta_r (r_{t^{¿}} - r_t)) + \varepsilon_t$

# Estimation Technique

- GMM estimation is the preferred estimation method.
  - Backward view is assumed.
  - Instruments list consist of endogenous variables, and exogenous oil price and excess liquidity.
- Overidentifying restrictions not significant.  All lagged coefficients significant , and significantly less than unity.
- The constant $\alpha$ is the domestic

# Data

- Estimation period: 1997q1-2008q2.
- Trinidad and Tobago data are obtained from the CBTT.  However, CPI used in the TOT are obtained from the IFS.
- 90-day Treasury bill is used as a proxy for the combination of REPO and Liquidity absorption in the TT market.
- US data are obtained from the IFS.
- Inflation is measured as quarter on quarter growth in CPI index.
- Headline CPI is inclusive of food index while the food index is excluded for core inflation.

# Estimation: Traditional Taylor Rule-Eq 1

- Core Inflation
  - Core Inflation can be stabilised by the short-term interest rate with a coefficient of 1.37 which is not significantly different to 1.5 recommended by Taylor for the US.
  - Output gap stabilised by the short-term interest rate with a significant coeficient of 0.56.
- Headline inflation
  - Headline inflation significant but not stabilised by the short-term interest rate.
  - Output gap not stabilised by the short term interest rate given the insignificance of it coefficient

# Estimation: Augmented Taylor Rule – Nominal Exchange Rate Eq2

- Absence of feedback when nominal exchange rate is included. Nominal exchange rate is not significant for either core or headline inflation. It did not impact on the significance of the inflation and output gap coefficients.
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# Estimation: Augmented Taylor Rule – Terms of Trade Eq3

- The terms of trade (p*/p) is lagged once since it was assumed that policy makers would collect information on prices with a lag. The TOT turned out to be significant only for core inflation. Its coefficient was -0.33. This would suggest that the short-term interest rate rises when core domestic price rise.
- The macroeconomic parameters turned out not to be significant for either core or headline inflation. This suggests the monetary authorities could not pursue

# Estimation: Augmented Taylor Rule – Interest rate parity Eq4-5

- Interest rate parity is significant in terms of both headline and core inflation.
- Interest rate parity is upheld in nominal terms. In both core and headline inflation models the Wald test shows that the coefficient of 0.96 and 0.84 are not significantly different from unity.
- The macroeconomic variables were only significant under headline inflation but it turned out to be negative, thus carrying the wrong sign.

# Summary

- The evidence suggest that the tradition Taylor rule can adequately capture the movement of the Treasury bill rate in the TT market with respect to core inflation.
  - This may occur as a result of the significant correlation between the short-term interest rates (0.76) and inflation rates (0.42) between the US and TT markets.
- Purchasing power parity is not upheld. Also the evidence suggest that the monetary authority could not achieve both purchasing power parity and stability of the macroeconomic parameters.
- The interest rate parity is upheld.
- The insertion of the exchange rate did not improve the applicability of the Taylor rule

# Conclusion

- The Traditional Taylor rule is more applicable to TT.
- Evidence suggest that the central bank Repo rate is more effective at targeting core inflation rather than headline inflation.
- The evidence suggest that the augmented Taylor rule may not make a difference to stabilisation when there is a managed float.
- Evidence suggest that the central bank could not simultaneously achieve stability