"Are Monetary Transmission Mechanisms Effective in the presence of Interest Rate Volatility: New Evidence in Latin American, the Caribbean and the United States"

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Motivation

- Monetary policy (through reduction in interest rate to fuel investment) is a major tool used to offset effects of recession in the Latin American and Caribbean region

- Monetary policy is only effective if pass-through is complete

- Not enough research done on the Caribbean and Latin American region to assess whether is tool is effective

Key Terms

- **Monetary Transmission Mechanism**

  This is the process through which monetary policy decisions affect the economy in general and the price level in particular.

- **Interest Rate Pass-through**

  This is the degree and the speed of changes of policy or market rate into retail banking rate.

- **Interest Rate Volatility**

  This is the extent to which the interest rate changes over time.

Introduction

- **Pass-through is essential for the effective conduct of monetary policy**
  - Central bank manipulates rates and impact is passed through to commercial bank rates
- **Financial markets are central for the conduct of monetary policy**
  - Monetary policy works through its influence on prices in the financial system

Introduction

- **Financial development impacts the effectiveness of monetary policy**
  - The effectiveness of monetary policy is measured through the level of pass-through, therefore the more sophisticated market have complete pass-through

Comparison of the Financial Sector for the Countries Analyzed

	Caribbean			Latin America		
	Barbados	Jamaica	Trinidad & Tobago	Brazil	Mexico	United States
5-bank asset concentration (%)	-	100	100	73.01	71.21	46.98^{2011}
Bank concentration (%)	100	89.99	98.78	61.71	53.28	35.38^{2011}
Financial system deposits to GDP (%)	117.49	38.98	56.71	59.94	25.03	78.76
Percentage of foreign bank assets among total bank assets (%)	100^{2009}	96^{2009}	54^{2009}	22^{2008}	75^{2009}	18^{2009}
Percentage of foreign banks among total banks (%)	100^{2009}	71^{2009}	67^{2009}	38^{2009}	48^{2009}	32^{2009}
H-statistic	-	0.431	0.541	0.751	-	0.689^{2010}
Lerner index	-	0.404	0.342	0.224	-	0.223^{2010}

Sourced from: The World Bank – Data is from 2010 unless specified

Objectives

- To ascertain whether the effectiveness of monetary policy is dependent on the level of financial development
- To assess the impact of economic stressors on monetary policy effectiveness
- To assess the effectiveness of monetary policy in the presence of policy rate volatility

Literature

- Cottareli and Kourelis (1994)
- Sander and Kleimeier (2002, 2004)
- Egert, Crespo-Cuaresmaand Reininger (2007)
- Singh, Razi, Endut and Ramlee (2008)
- Wang and Lee (2009)
- Karagiannis, Panagopoulos and Vlamis(2010)
- Tai Sek and Har (2012)
- Haughton and Iglesias (2012)

Literature

- Singh, Razi, Endut and Ramlee (2008) -*Impact of financial market developments on the monetary transmission mechanism*

  Monetary transmission is affected by:
  – **Financial liberalization**

  – **Financial disintermediation**

  – **Financial innovation**

  – **Financial consolidation**

  – **Payment instrument technology**

  – **Islamic finance**.

Literature

- **Cottarelli and Kourelis (1994)-** *Financial Structure, Bank Lending Rates and the Transmission Mechanism of Monetary Policy*
  - **Differences in pass-through for countries**:
    - Degree of competition
    - Money market development
    - Private –public ownership of banking institutions
    - Barriers to foreign competition

- **Tai Sek and Har (2012**)- *Interest Rate Pass-through and Monetary Transmission in Asia*
  - **Tested interest rate pass-through in pre-crisis and post-crisis periods to assess the degree of pass-through across countries in both periods**

- **Haughton and Iglesias (2012)-** *Interest Rate Volatility, Asymmetric Interest Rate and Monetary Transmission Mechanism in the Caribbean*

  - ***Assessed the level of asymmetric pass-through, the impact of volatility and monetary transmission mechanism in the Caribbean***

    - **Dynamic OLS- to measure the level of pass-through**
    - **EGARCH-m(1,1) - to measure volatility**

Data

Monthly data from 2002:01 to 2012: 02

- **Treasury Bill Rate**
- **Deposit Rate**
- **Lending Rate**

International Monetary Fund (IMF) International Financial Statistics (IFS)

Latin America: **Brazil, Mexico**

Caribbean: **Barbados, Jamaica, Trinidad & Tobago**

The United States of America (*for comparison*)

Methodology

- Modeling the Long run relationship between policy rate and retail rates:

$$RR_t = \beta_0 + \beta_1 PR_t + u_t \tag{1}$$

Where:

- RR_t is the retail deposit or the retail lending rate
- PR_t is the policy rate

Methodology

- ## The Dynamic Ordinary Least Square:
  - This is regressing leads and lags of the differences policy rate on the retail rate.

$$\Delta RR_t = \beta_0 + \sum_{i=1}^{M} \theta_i \, \Delta PR_{t+i} + \sum_{i=1}^{M} \varphi_i \, \Delta PR_{t-i} + u_t \qquad\qquad (2)$$

Where:

θ_i is the parameter on the leads in the DOLS equation

φ_i is the parameter on the lagged values on the DOLS equation

M is the optimal number of leads/ lags.

Methodology

- Zivot Andrew unit root test for structural break
  - **This is used to identify the natural break date in the treasury bill rate**

Model specification into pre and post crises:

$$\Delta RR_{1t} = \beta_0 + \sum_{i=1}^{M} \theta_i \, \Delta PR_{1t+i} + \sum_{i=1}^{M} \varphi_i \, \Delta PR_{1t-i} + u_{1t} \tag{3}$$

$$\Delta RR_{2t} = \beta_0 + \sum_{i=1}^{M} \theta_i \, \Delta PR_{2t+i} + \sum_{i=1}^{M} \varphi_i \, \Delta PR_{2t-i} + u_{2t} \tag{4}$$

Where:

- RR_{1t} is the pre-crisis retail deposit or the retail lending rate
- PR_{1t} is the pre-crisis policy rate
- RR_{2t} is the post-crisis retail deposit or the retail lending rate
- PR_{2t} is the post-crisis policy rate

Methodology

- EGARCH-M(1,1) model

$$\Delta RR_t = a_0 + a_1 \Delta PR_{t-1} + \varepsilon_t \qquad (5)$$

- In the presence of heteroskedasticity we get:

$$\Delta RR_t = a_0 + a_1 \Delta PR_{t-1} + s_i \sqrt{\sigma^2} + \varepsilon_t \qquad (6)$$

Methodology

- EGARCH-M(1,1) model
  - We incorporate the DOLS in the EGARCH-M(1,1)

$$\Delta RR_t = a_0 + p_i \Delta PR_t + \sum_{i=1}^{M} \theta_i \Delta PR_{t+i} + \sum_{i=1}^{M} \varphi_i \Delta PR_{t-i} + \sum_{j-1}^{q} \delta_i V_{t-j} + s_i \sqrt{\sigma^2} + \varepsilon_t \qquad (7)$$

$$\log(\sigma_t^2) = \omega + \alpha \left| \frac{V_{t-1}}{\sigma_{t-1}} \right| + k \frac{V_{t-1}}{\sigma_{t-1}} + b\log(\sigma_{t-1}^2) \qquad (8)$$

Results: Dynamic OLS

Table 2: *Results of the Dynamic OLS of long run parameters from equation (2)*

	$\hat{\beta}_0$		$\hat{\beta}_1$ TR		$H_0: \hat{\beta}_1 = 1$ Pass-through	
Barbados						
Deposit	-0.002307	(0.8995)	0.222522	(0.1042)	-5.727888	(0.0000)
Lending	-0.002725	(0.8708)	0.326407	(0.0101)	-5.412961	(0.0000)
Brazil						
Deposit	-0.022534	(0.6851)	0.671319	(0.0000)	-2.14788	(0.0341)
Lending	-0.051068	(0.7055)	1.117046	(0.0034)	0.314499	(0.7538)
Jamaica						
Deposit	-0.041254	(0.2086)	0.037011	(0.4637)	-19.13893	(0.0000)
Lending	-0.008519	(0.8595)	-0.091865	(0.2179)	-14.7369	(0.0000)
Mexico						
Deposit	-0.016935	(0.0267)	0.362183	(0.0000)	-14.73037	(0.0000)
Lending	-0.001834	(0.9471)	1.260444	(0.0000)	1.641516	(0.1038)
Trinidad & Tobago						
Deposit	0.020011	(0.5549)	1.177921	(0.0000)	0.810113	(0.4198)
Lending	-0.017622	(0.5525)	0.479194	0.0143	-2.709584	(0.0079)
United States						
Deposit	0.000396	(0.9315)	0.995576	(0.0000)	-0.125333	(0.9005)
Lending	0.001366	(0.7482)	0.985601	(0.0000)	-0.441599	(0.6597)

Level of significance in parentheses ()

Results:
DOLS accounting for structural breaks (Economic Stressors)

Table 3: *Results of the Dynamic OLS accounting for structural breaks from equations (3) and (4)*

		Pass-through Ho: $\beta_1=1$			Pass-through Ho: $\beta_1=1$
Barbados					
Pre-crisis	Deposit	No	*Post-crisis*	Deposit	No
	Lending	No		Lending	No
Brazil					
Pre-crisis	Deposit	Yes	*Post-crisis*	Deposit	No
	Lending	Yes		Lending	Yes
Jamaica					
Pre-crisis	Deposit	No	*Post-crisis*	Deposit	No
	Lending	No		Lending	No
Mexico					
Pre-crisis	Deposit		*Post-crisis*	Deposit	No
	Lending			Lending	No
Trinidad & Tobago					
Pre-crisis	Deposit	Yes	*Post-crisis*	Deposit	Yes
	Lending	Yes		Lending	Yes
United States					
Pre-crisis	Deposit	Yes	*Post-crisis*	Deposit	Yes
	Lending	Yes		Lending	Yes

Results:
DOLS & EGARCH-M(1,1)

Table 4: *Summary table of DOLS and EGARCH-M (1, 1) analyses*

	Mark up/Mark down β_0	Pass-through Ho: $\beta_1 = 1$	Impact of Interest rate volatility (s)	Conditional Variance (k)	Relationship Between retail rates adjustment margins and policy rate (p)	Pass-through in the presence of volatility Ho: $\beta_1 = 1$
Barbados						
Deposit Rate		No		Negative	Positive	No
Lending Rate		No		Negative	Positive	No
Brazil						
Deposit Rate		No			Positive	No
Lending Rate		Yes			Positive	No
Jamaica						
Deposit Rate		No		Positive	Negative	No
Lending Rate		No			Negative	No
Mexico						
Deposit Rate	Mark Down	No	Negative		Positive	No
Lending Rate		Yes		Positive	Positive	Yes
Trinidad & Tobago						
Deposit Rate		Yes	Positive			No
Lending Rate		No		Positive		No
United States						
Deposit Rate		Yes			Positive	No
Lending Rate		Yes			Positive	Yes

Conclusion

- **Interest rate pass-through is similar in countries with relatively similar levels of financial development**

- **There is not enough evidence to say that in the presence of economic stressors pass-through becomes incomplete**

- **In the presence of volatility interest rate pass-through is incomplete for countries that are less financially developed**

Recommendation

- In order for countries with incomplete pass through to effectively employ monetary policy, some level of financial development must take place

- Recommend:
  - Financial Liberalization
  - Financial Innovation
  - Payment Instrument technology

Thank You