THE INTERACTION BETWEEN MONETARY POLICY AND STOCK PRICES: A COMPARISON BETWEEN THE CARIBBEAN AND THE US

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Contents

Global Financial Crisis

- The damage to the world economy caused by the unexpected increase in asset prices beyond their true values, spiralled out of control, partly due to insufficient monitoring of asset price movements in developed and developing countries

- Jamaican Stock index increased by 275% between the years 2000 and 2005, the Barbados index increased by about 88% and the T&T stock index increased by 142% during the same period of time, which should have indicated to the market that the price bubble is ominous
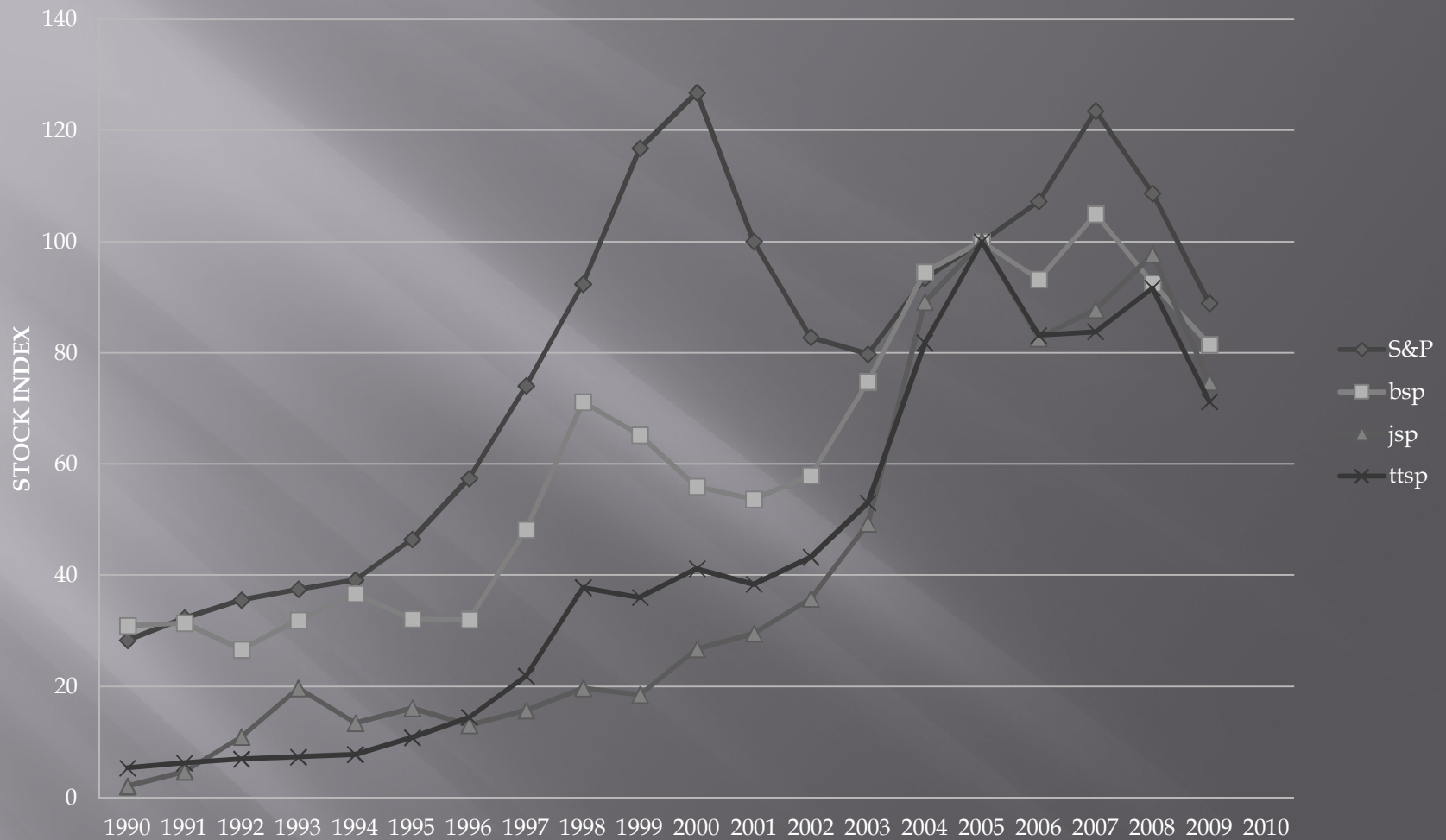
Figure 1: Annual stock price index for Barbados (bsp), Jamaica (jsp), Trinidad and Tobago (ttsp) and the US (S&P)

Stock Market

- These increases in stock prices have an impact on the macro economy via two channels; first through the wealth effect and second through its effect on the level of investment.

- Stock prices influence firm's ability to finance investment projects. Firms with higher stock values are in a better position to receive more equity, see Rigobon and Sack (2001).

Interest rates

- High interest rates mean high cost of borrowing so firms invest less.

- If firms cannot invest it means that the present value of their future cash flows will also decline and this has a direct negative impact on firms' stock prices.

- The second avenue is through availability of credit.

- If government uses tight monetary policy then there is less credit available and economic activity slows down

Interaction

- In theory, increase in money demand means that economic agents will sell assets to satisfy their liquidity needs, the sale of assets means a fall in asset prices which is associated with an increase in interest rates.

- Asset prices influence invest via the Tobin's Q effect, if the central bank uses aggregate demand as an instrument to control inflation, then the relationship between interest rates and stock prices important

- Therefore, any model used to estimate the relationship between stock prices and interest rates would have to accommodate any simultaneity which may exist between both variables
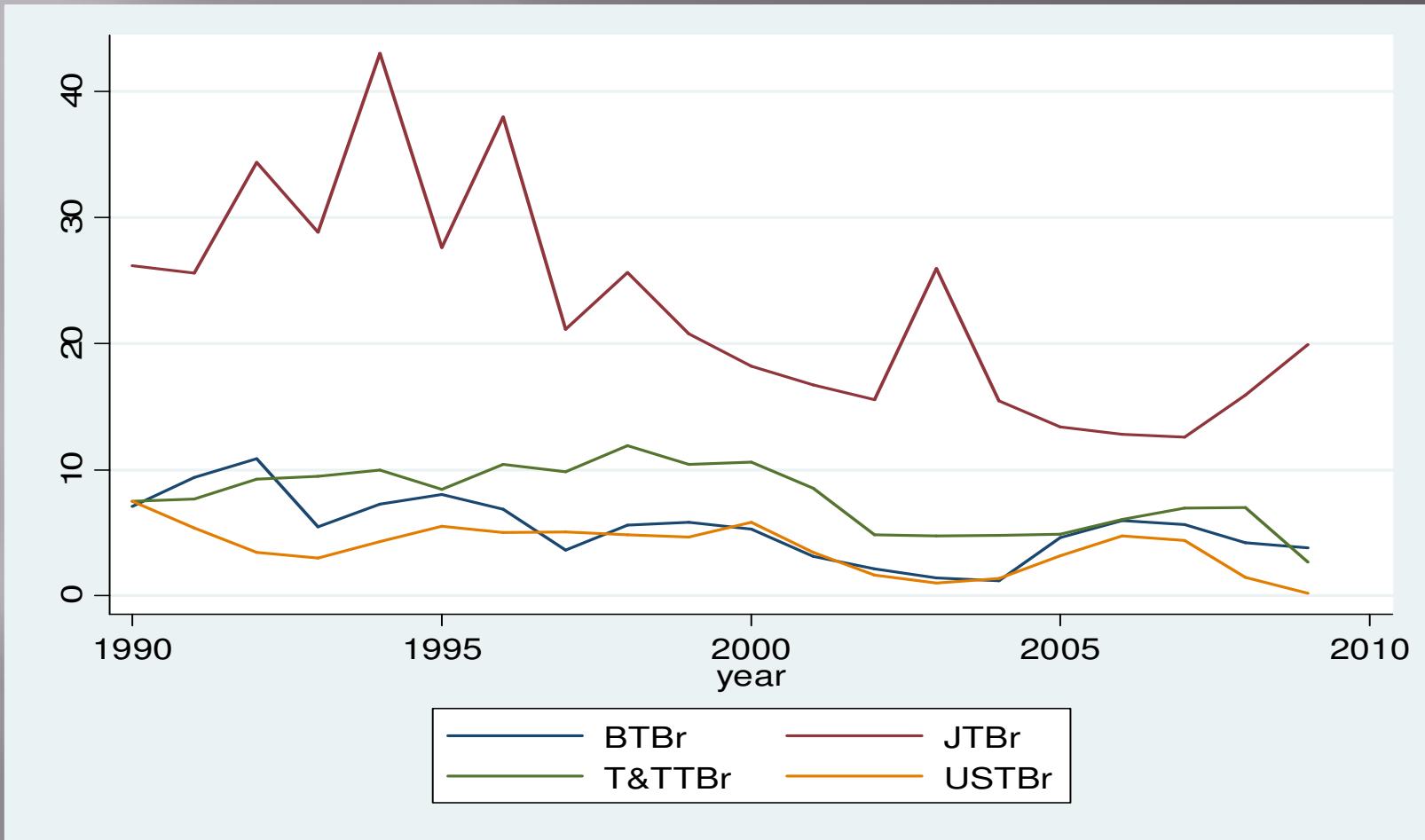
Figure 2: *Annual Treasury bill rate for Barbados (BTBr), Jamaica (JTBr), Trinidad and Tobago (T&TTBr)and the USA (USTBr)*

Literature

- Thorberke (1997)
- Rigoban and Sack (2001)
- Theoretically, Bordo and Jeanne (2002)
- Gilchrist and Leahy (2002)
- Mann, Atra and Dowen (2004)
- Cassola and Morana (2004)
- Rigobon and Sack (2004)
- Ioannidis and Kontonikas (2007)
- Basistha and Kurov (2008)
- Bjornland and Leitemo (2009);

The structural VAR model

□ Let A_t be the vector of macroeconomic variables with the following order

$$A_t = \left[y_t , \pi_t , \Delta s_t , r_t \right]'$$

□ y_t is log of the de-trended industrial production index (IPI),

□ π_t is changes in the log of consumer price index (CPI)

□ Δs_t is changes in the log of the stock index for the specific country deflated by the CPI

□ r_t the central bank's Treasury bill rate

□ It can be converted to the following moving average process;

$$A_t = B(L)u_t,$$

where u_t is a (4×1) vector of reduced form errors and

$$B(L) = \sum_{j=0}^{\infty} B_j L^j = I + b_1 L + b_2 L^2 + b_3 L^3 + \ldots + b_\infty L^\infty \quad \text{is a convergent}$$

matrix polynomial in the lag operator L.

The vector of reduced form residuals u_t can be written as a linear combination of the innovations e_t, which is identically independently distributed with mean zero and positive definite covariance matrix Ч, such that $u_t = Qe_t$, where Q is a lower diagonal contemporaneous matrix

$$A_t = C(L)e_t,$$

▣ Therefore

$$C_t = B(L)Q$$

In matrix form

$$
\begin{bmatrix} y_t \\ \pi_t \\ \Delta s_t \\ r_t \end{bmatrix} = B(L) \begin{bmatrix} Q_{11} & 0 & 0 & 0 \\ Q_{21} & Q_{22} & 0 & 0 \\ Q_{31} & Q_{32} & Q_{33} & Q_{34} \\ Q_{41} & Q_{42} & Q_{43} & Q_{44} \end{bmatrix} \begin{bmatrix} e_t^y \\ e_t^\pi \\ e_t^s \\ e_t^r \end{bmatrix}
$$

We impose the restriction

So that

$$\sum_{j=0}^{\infty} B_j Q = \sum_{j=0}^{\infty} C_j$$

$$B_{31}(1)Q_{14} + B_{32}(1)Q_{24} + B_{33}(1)Q_{34} + B_{34}(1)Q_{44} = 0$$

DATA

- The model is estimated using monthly data for Barbados from 1990M3 to 2009M12.

- The same is done for Barbados, Jamaica and Trinidad and Tobago using annual data from 1990 to 2009.

- Annual data is employed because there is no monthly data available to measure output in Jamaica and Trinidad and Tobago.

- The IMF's International Financial Statistics (IFS) provide the monthly data on the Industrial production Index (IPI), the Treasury bill rate and the Consumer price index for Barbados, the annual data on the real GDP index, annual the Treasury bill rate and the consumer price index (CPI) for all three countries.

- data on the stock market index for each country is provided by their respective stock exchange; the Barbados stock index, Jamaican stock index and data on Trinidad and Tobago stock index

RESULTS

Monetary Policy Shock

Variables	Barbados Monthly	Barbados Annual	Jamaica Annual	Trinidad and Tobago annual	USA
Output	-0.003	0.006	-0.800	-0.010	-0.5
Inflation	-0.001	0.008	0.003	0.007	0.05
Stock prices	0.038	-0.060	-0.300	-0.100	-6.00
Treasury bill rate	-25 bp	-70 bp	-550 bp	-120 bp	-4 bp

Table 1: Compares the instant effects of a monetary policy shock on the output gap, inflation, stock prices and the Treasury bill rates bp = basis points.

Stock Price Shock

Variables	Barbados Monthly	Barbados Annual	Jamaica Annual	Trinidad and Tobago annual	USA
Output	-0.001	0.400	0.350	-0.001	0.030
Inflation	-0.008	-0.004	0.029	0.009	0.010
Stock prices	-0.040	-0.190	-0.400	-0.500	1.200
Treasury bill rate	30 bp	190 bp	400 bp	330 bp	6 bp

Table 2.2: Compares the instant effects of a stock price shock on the output gap, inflation, stock prices and the Treasury bill rate

Economic Indicators

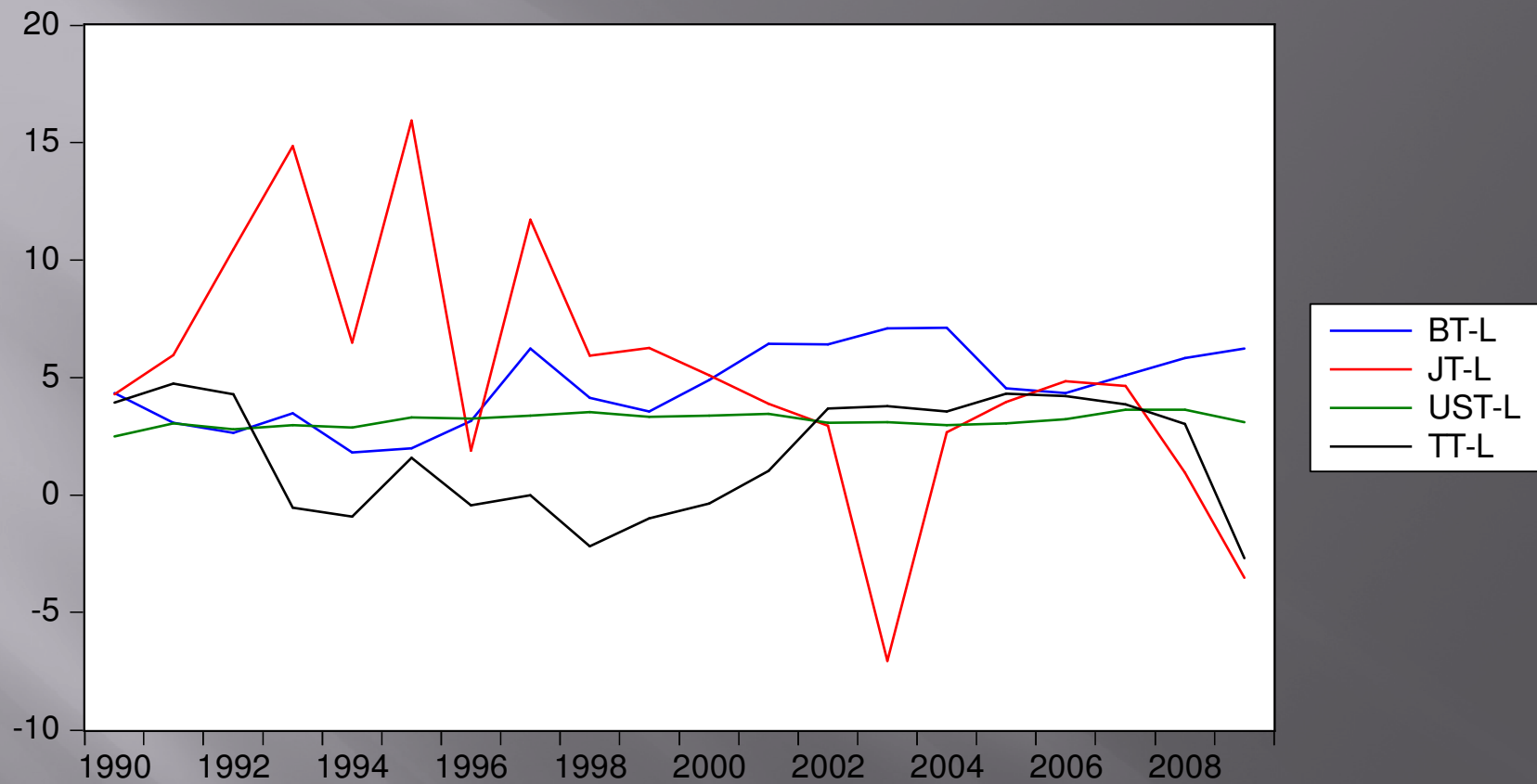|	Barbados	Jamaica	Trinidad and Tobago	USA
Population	284,589	2,825,928	1,229,953	307,212,123
GDP per capita	$ 18500	$8,200	$23,100	$46,400
Labour force	0.175 m	1.311 m	0.629 m	154.100 m
Money supply	$3.701	$4.244	$3.506	$10,990.000
Market value of publicly traded shares	$5.599	$7.5130	$12.160	$19,950.000
Exports	$0.385	$1.422	$10.640	$994.700
Imports	$1.586	$4.625	$7.449	$1445.000

Figure 3: Difference between the Treasury bill rate and the commercial banks' lending rate in Barbados (BT-L), Jamaica (JT-L), Trinidad and Tobago(TT-L) and the USA (US-L)

Conclusion

- Our results for annual data is similar to that of the US using monthly data.
- We attest this to the slow transmission mechanism in the Caribbean.
- However, the magnitudes are different.
- A monetary policy shock has a greater impact on the stock market in the US than in the Caribbean,
- While the effects of a stock price shock is smaller in the US than the Caribbean
- Moreover, the higher economic instability in the Caribbean is clearly observed in the larger effect that a stock price increase has on interest rates versus the USA.
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THANK YOU