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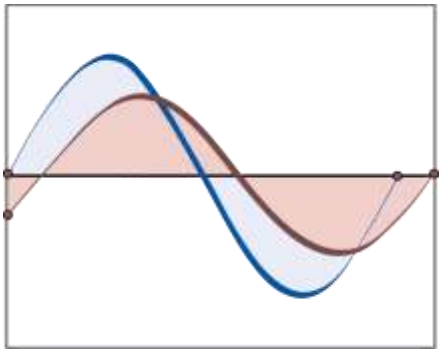

Price Stability and Financial Stability in Trinidad and Tobago: Is there a relationship? What is the direction of this relationship?

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The relationship between price stability and financial stability is one that has been questioned for many years and gained popularity over the last decade due to the global financial crisis. This paper aims to analyze the relationship between price and financial stability using simple correlation and causal analysis and well as a traditional and Bayesian Vector Auto Regression (VAR) model. It was found that while the correlation between the variables were moderate to high, no causal relationship existed between them as illustrated by the use of the Granger Causality test. Furthermore, impulse response functions from both the reduced form VAR and the Bayesian VAR suggested that there was little relationship between price and financial stability in Trinidad and Tobago. As a result, it can be inferred that financial stability requires its own tools and policies and monetary policy tools are not sufficient to promote and maintain financial stability.

JEL Classification: C11, C22, E31, G20

Keywords: Price stability, Financial stability, Bayesian VAR

1. Introduction

Does price stability imply financial stability? This is a question that has been researched for decades, but interest in the topic has increased greatly in popularity since the global financial crisis in 2007/2008. Other related questions include can monetary policy promote financial stability? Or is there a greater need for macroprudential policies? The literature does not provide definitive answers to these questions. Authors such as Blot et al. (2015) and Christe and Lupu (2014) put forth the view that financial stability and price stability possess little relationship with each other. Others such as Smets (2014), Van den End (2010) and Apostoaie (2010) argued that price stability is a useful and in some cases necessary prerequisite for financial stability.

Before analyzing the linkage between price and financial stability, it is important that to clarify these concepts. Price stability is usually the single most important macroeconomic objective of any Central Bank. It refers to a stable price level or low level of inflation. Some countries have explicitly defined price stability in terms of a year-on-year price change of no more than two per cent. On the other hand, by its very nature, financial stability has been very difficult to define. The term is broad and encompasses the state and interconnectedness of financial intermediaries, financial markets and financial infrastructure. A stable financial system should foster the development of an economy and alleviate financial imbalances that build endogenously or due to significant and unanticipated events (Schinasi, 2004).

The aim of this paper is test if there is a relationship between price stability and financial stability in Trinidad and Tobago and to examine the direction of this relationship between the selected set of indicators. There is a void in quantitative analysis on the relationship between price and financial stability in Trinidad and Tobago and as such, this paper provides a useful starting point for measuring this relationship. This paper uses quarterly data of selected financial stability and price stability indicators between March 2000 and March 2015 to determine the direction and magnitude of shocks to the indicators. Correlation analysis and Granger Causality was used as well as a reduced form VAR as proposed by Blot et al. (2015) and a Bayesian VAR. Both models found that shocks to both price and financial stability indicators have relatively insignificant responses on each other.

The remainder of this paper is as follows: Section two encompasses the relevant literature that lays the foundation for the analysis. Section three examines the variables and indicators used to proxy price and financial stability in the local context. In addition, it gives a brief data description and correlation and causal analysis. Section four includes the estimation of the reduced VAR and the Bayesian VAR and their respective impulse response functions. Lastly, section five gives a conclusion and some brief policy recommendations.

2. Literature Review

In wake of the recent global financial crisis, Smets (2014) found that many economies now turn to macroprudential policies, but to varying extents. For example, some economies make minor adjustment to their inflation targeting framework while others place financial stability and price stability on the same level. Smets (2014) argued that the most seen scenario is somewhere in between and concluded that macroprudential policies can be used to monitor and maintain financial stability as well as using monetary policy to assist macroprudential policies in maintaining financial stability.

Schwartz (1988) put forth the view that shocks to financial stability are often made worse in the presence of price fluctuations. As such, inflation targeting and monetary policy can also contribute to financial stability. Bordo and Wheelock (1998) stated that price shocks in the form of commodity price shocks and real estate markets can cause financial distress if it continues for a number of years. Furthermore, speculation and investments may increase due to inflation expectations. However, if there is an abrupt decline in prices, borrowers may not be able to repay their loans thereby contributing to credit risks, default and the failure of financial institutions. They concluded by stating that regardless of the triggers of the financial distress, it is usually intensified during inflationary/disinflationary pressures.

Kunt and Detragiache (1998) used a logistic regression for both developing and developed nations in the presence of repeated systemic banking sector problems between 1980 and 1994 and found that financial crises usually exist when the rate of inflation is high. High and volatile inflation rates are usually accommodated by contractionary monetary policy in the form of higher nominal interest rates and maturity transformation problems. The authors also found that where there is the presence of an explicit deposit insurance scheme, banking crises are usually more frequent and severe due to moral hazard.

Van den End (2010) used an early warning signal approach to map the trade-off between price stability and financial stability. He found that periods of financial stability coincided with price stability in both the US and UK. The author then investigated the relationship between macroprudential and monetary policy. Using a binary probit model, he analyzed which macroeconomic conditions and variables lead to the interference in the coordination between both monetary policy and macroprudential policy. The estimated results suggested that when macroeconomic and financial disturbances occur, it interferes with the optimal policy coordination between both policy objectives.

Apostoaie (2010) studied the relationship between two main objectives of the central bank, that is, price stability and financial stability. The author concluded that emphasis should be placed on both financial and price stability. Given the interconnectedness of the macroeconomic and financial sectors in an economy, if financial shocks occur, it may have consequences for macroeconomic objectives such as price stability and if the economy is faced with macroeconomic shocks such as volatile inflation rates, it puts pressure on the financial system.

Gilchrist and Leahy (2002) examined how asset prices influenced financial stability which in turn had a rippled impact on price stability. One reason they proposed that financial stability might impact price stability is through the wealth effect. When an asset price boom occurs, it leads to an increase in consumption as proposed by Friedman's permanent income hypothesis. This rise in consumption usually fuels higher levels of inflation. Additionally, the authors proposed that the relationship works both ways and when asset price falls, consumption and consequently inflation falls as well.

Abu et al. (2011) used an Autoregressive Distributed Lag (ARDL) framework to estimate quarterly data between 1985 and 2005 for Bangladesh in an attempt to illustrate the relationship between the financial sector and inflation. They argued that an efficient financial sector allocates its resources efficiently which should stimulate economic activities. However, inflation can lead to volatility in the financial markets, specifically with equity returns and lower levels of investment due to policy measures to curb high inflation rates. Their estimated results led to the inference that inflation interferes with the efficiency of the financial markets in both the short and long term.

Christe and Lupu (2014) examined the relationship between price stability and financial stability and the policies used to achieve both objectives. The authors argued that the policies to achieve price stability were short term and changed as business cycles change. However, the policies for financial stability were long term. It is believed that if a Central Bank broadens its operational framework to now include financial stability, it may lead to a shift away from a Central Bank's independence and less emphasis will be placed on the primary objective of price stability. However, it was proposed that since financial stability is of crucial interest to the economy, there should be a specific focus on price stability and a general focus on financial stability due to the linkages in the economy.

Blot et al. (2015) investigated the link between price and financial stability in the US and Eurozone using monthly data between 1993 and 2012. The authors estimated both a Vector Autoregression (VAR) model and a Dynamic Conditional Correlation analysis. None of the estimated models showed a robust link between price and financial stability and more so, this relationship was not stable over time. The authors therefore questioned the conventional wisdom of 'leaning against the wind' since evidence showed that financial instability can still occur in the presence of low inflation rates.

3. Data Description and Stylized Facts

The dataset uses quarterly data from March 2000 to March 2015 on key macroeconomic and financial stability variables for Trinidad and Tobago.

Table 1: Variables and Definitions

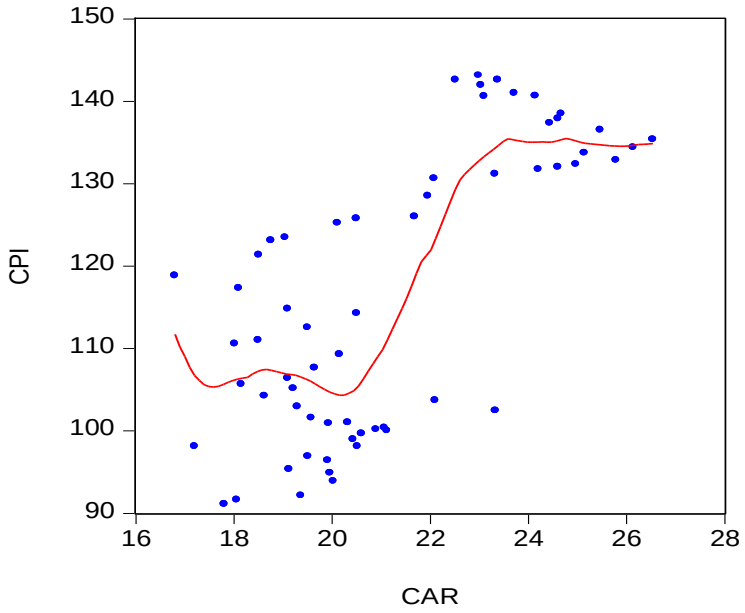
Variable	Notation	Definition
Capital Adequacy Ratio	CAR_t	The capital ratio is calculated using the definition of regulatory capital and risk-weighted assets. The total capital ratio must be no lower than 8% (Basel II).
Private Sector Credit	PSC_t	Loans and credit to the private sector. Measured in TT Millions.
Non-performing Loans	NPL_t	A loan that is in default or close to being in default. Non-performing loans are usually those past due in excess of 3 months
Oil Price	OP_t	Price of oil per barrel as measured by the West Texas Intermediate
Productivity Index	PI_t	This is an index of the various productive sectors, excluding the energy sector in Trinidad and Tobago. The production index is viewed as a measure of output.
Retail Price Index	RPI_t	An index of consumer prices which measures changes in the prices of goods and services bought for household consumption. Core inflation is used which excludes food price inflation, with a base year 2003= 100
Stock Market Index	SMI_t	This is an index of the prices of all the stocks traded on the Trinidad and Tobago Stock Exchange, with the weights based on the volume of the transaction
10 year Government Bond Yield	$YIELD_t$	10 year interest rate on government bonds
Interest Rate	R_t	This is the lowest rate on loans granted to customers. It does not include concessionary rates on certain categories of loans, for example, staff loans.

Source: Central Bank of Trinidad and Tobago

To begin the analysis, the correlation between the measures of inflation, that is, the RPI and other key indicators of financial stability such as CAR, NPL and PSC is assessed.

The correlation between CAR and RPI is highly positive with a correlation coefficient of 0.72. This is contrary to what is observed in the literature. Cao (2014) in the study of commercial banks in the US found that moderate inflation is supposed to lead to a capital loss by the bank and more so to the banks that are systematically important. Cao (2014) stated that "*due to the mismatch of maturity between assets and liabilities, a persistent increase in inflation rate causes a larger decline in bank asset value than in liability value. We find that a one percent permanent increase in inflation rate leads to an average 15 percent loss of Tier 1 capital to U.S. commercial banks*". Hortlund (2005) also supports this view where he found an inverse relationship between inflation and capital in Swedish banks. Furthermore, Blot et al. (2015) also found a negative correlation between RPI and CAR. Granger causality also led to the non-rejection of RPI causing CAR in Trinidad and Tobago.

Figure 1: Correlation between RPI and CAR

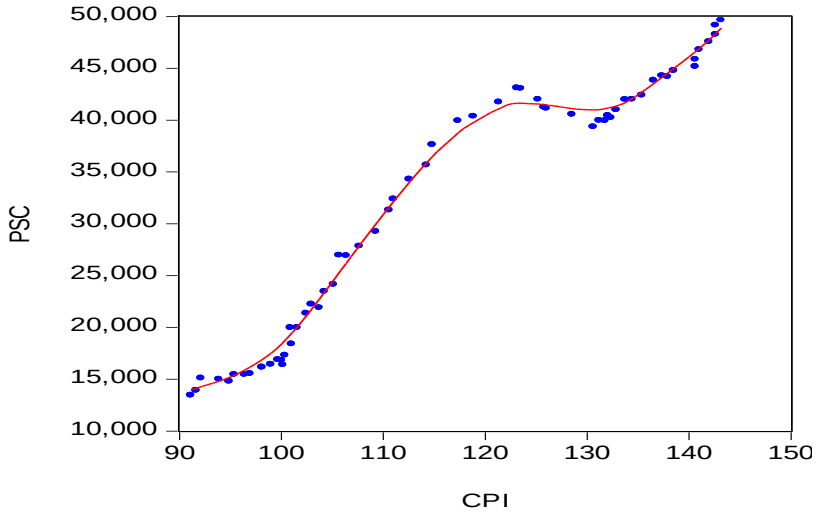


Source: Authors' Calculation

Additionally, a 96 per cent correlation was found between RPI and PSC. Arsene and Guy-Paulin (2013) in their analysis found that there is a bi-directional relationship between RPI and PSC. A low and stable rate on inflation promotes economic growth which results in an increase demand for PSC and this in turn will contribute to an increasing inflation rate through spending. This was supported by Younus (2012) who found that PSC is highly correlated to the inflation rate as well as a significant causality relationship exists between both variables. Conversely, Korkmaz (2015) in a panel analysis of ten selected European nations found that PSC did not contribute

to the inflation rate in the economy. Whilst the data for Trinidad and Tobago yielded a high correlation between the two variables, there was no significant causal relationship between them.

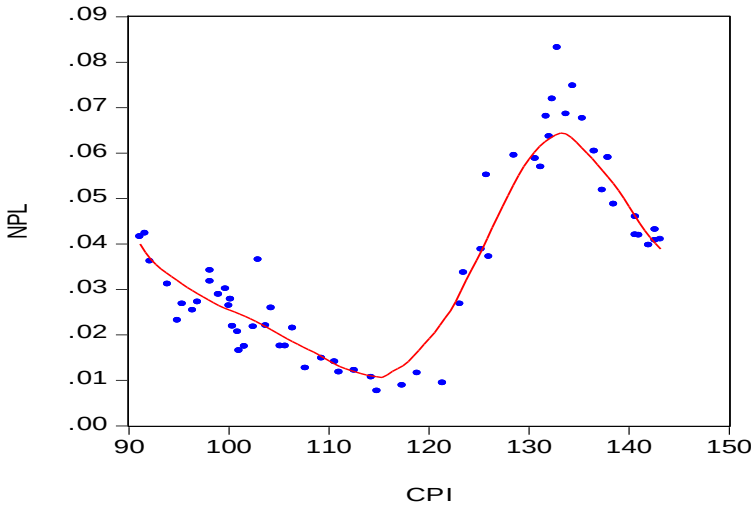
Figure 2: Correlation between PSC and RPI



Source: Authors' Calculation

A moderately high correlation coefficient of 60 per cent was found between RPI and NPL in Trinidad and Tobago. These results are consistent with Farhan et al. (2012) in their analysis which also found a positive and statistically significant relationship between NPL and RPI. Endut et al. (2013) in their panel analysis of Asian Pacific economies found that in the short run, inflation and non-performing loans has an inverse relationship since Central Banks will increase interest curb inflation however in the long run, inflation volatility is positively correlated with non-performing loans. In Trinidad and Tobago, even though there was a moderately high positive correlation, no causal relationship existed between NPL and RPI. This is illustrated in figure three.

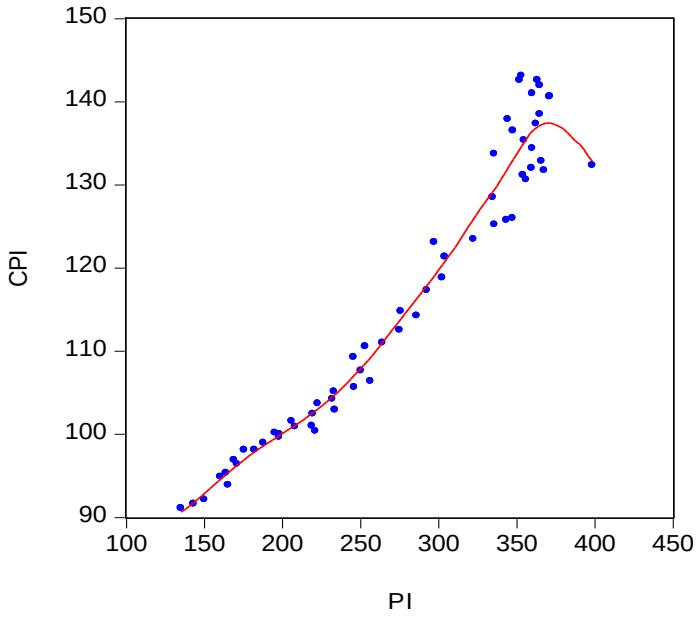
Figure 3: Correlation between NPL and RPI



Source: Authors' Calculation

Furthermore, a near perfect correlation of 97 per cent was found between RPI and the productivity index. However, the causal link between both variables was insignificant. This was consistent with the relationship found by Yildirim (2015) where the author's estimation found that inflation had a greater impact on productivity than increases in real wages. Similarly, there was a feedback relationship.

Figure 4: Correlation between RPI and PI



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4. Methodology, Estimation and Results

All variables required for estimation log linear and tested for stationarity using the Augmented Dickey-Fuller (ADF), Phillips-Perron (PP) and Kwiatkowski–Phillips–Schmidt–Shin (KPSS) test. They were all non-stationary in levels but stationary in first difference. As such the model was estimated using logged differenced stationary variables.

Table 2: Stationarity Testing

Variable	ADF (Level)	ADF(First Differenced)	Phillips-Perron (Level)	Phillips-Perron First Differenced)	KPSS (Level)	KPSS (First Differenced)
CAR_t	-1.82*	-13.11**	-2.83*	-13.20**	0.14***	0.43****
PSC_t	-0.39*	-4.09**	-0.78*	-6.59**	0.20***	0.30****
NPL_t	-2.00*	-8.95**	-2.12*	-8.84**	0.15***	0.14****
OP_t	-1.24*	-5.81**	-1.31*	-4.53**	0.19***	0.26****
PI_t	-0.47*	-7.36**	-1.45*	-9.12**	0.25***	0.60
CPI_t	-1.73*	-2.62	-1.24*	-6.87**	0.12***	0.17*****
SMI_t	-1.88*	-5.36**	-1.65*	-5.35**	0.13***	0.10****
$YIELD_t$	-0.93*	-5.83**	-1.28*	-5.89**	0.22***	0.15****
R_t	-1.89*	-5.19**	-1.80*	-5.18**	0.09	0.12****

Where * denotes the variables are not significant at the 10% level of significance and ** denotes the significance at the 1% level of significance.*** and **** denotes the significance and insignificance respectively of the KPSS test at 5% level of significance since the hypotheses are opposite to that of the ADF and the PP.

Following the convention in the literature, this paper starts off with a Vector Autoregression (VAR) model to assess relationship between price and financial stability to determine whether the relationship follows a particular direction or is feedback in nature. Blot et al. (2015) proposed the following specification:

$$Y_t = \alpha + \gamma_1 Y_{t-1} + \cdots + \gamma_p Y_{t-p} + \varepsilon_t \quad (1)$$

$$Y_t' = [PI_t, CPI_t, PSC_t, IR_t, SMI_t, YIELD_t, CAR_t, NPL_t,] \quad (2)$$

Y_t' is a $8\ x\ 1$ vector of endogenous differenced stationary variables α' is a $8\ x\ 1$ vector of constants, γ_p' is a $24\ x\ 8$ matrix of coefficients and ε_t' is a $8\ x\ 1$ vector of residuals. Oil price (OP_t) was also included in the model as an exogenous variable.

Orthogonalization [1] of the residuals so that the model becomes identifiable [2] was done using the Cholesky Decomposition can be used. This is necessary since the co-variance matrix is unlikely to be diagonal[3]. Using the Cholesky decomposition, the endogenous variables assume a particular ordering, where residual correlation of any variable pair is attributed to the first variable in the system. By using the Cholesky decomposition, the variables are arranged such that the initial variables in the system has contemporaneous effects on all subsequent variables in the ordering but only lagged effects on the variables prior to it. The macroeconomic variables are ordered after the risk variable since it is advocated that they have a lagged reaction to the financial variables. That is the latter ordered variables in the system and responds instantaneously to shocks on real sector variables. The model was also estimate using three lags as suggested by the Final Prediction Error lag length criteria.

Model Robustness

Prior to interpreting the impulse response functions of the estimation, the robustness of the model needs to be validated to strengthen the reliability and validity of the inferences. Several tests for model robustness were undertaken and the following was found.

Table 3: Model Diagnostic

Test	Statistic/Description	Inference
Jarque-Bera	16.86	Residuals normally distributed
Serial Correlation LM	51.12 (3 lags)	No serial correlation exist
AR Roots	All roots are less than modulus one	VAR model is stable

Source: Authors' Calculation

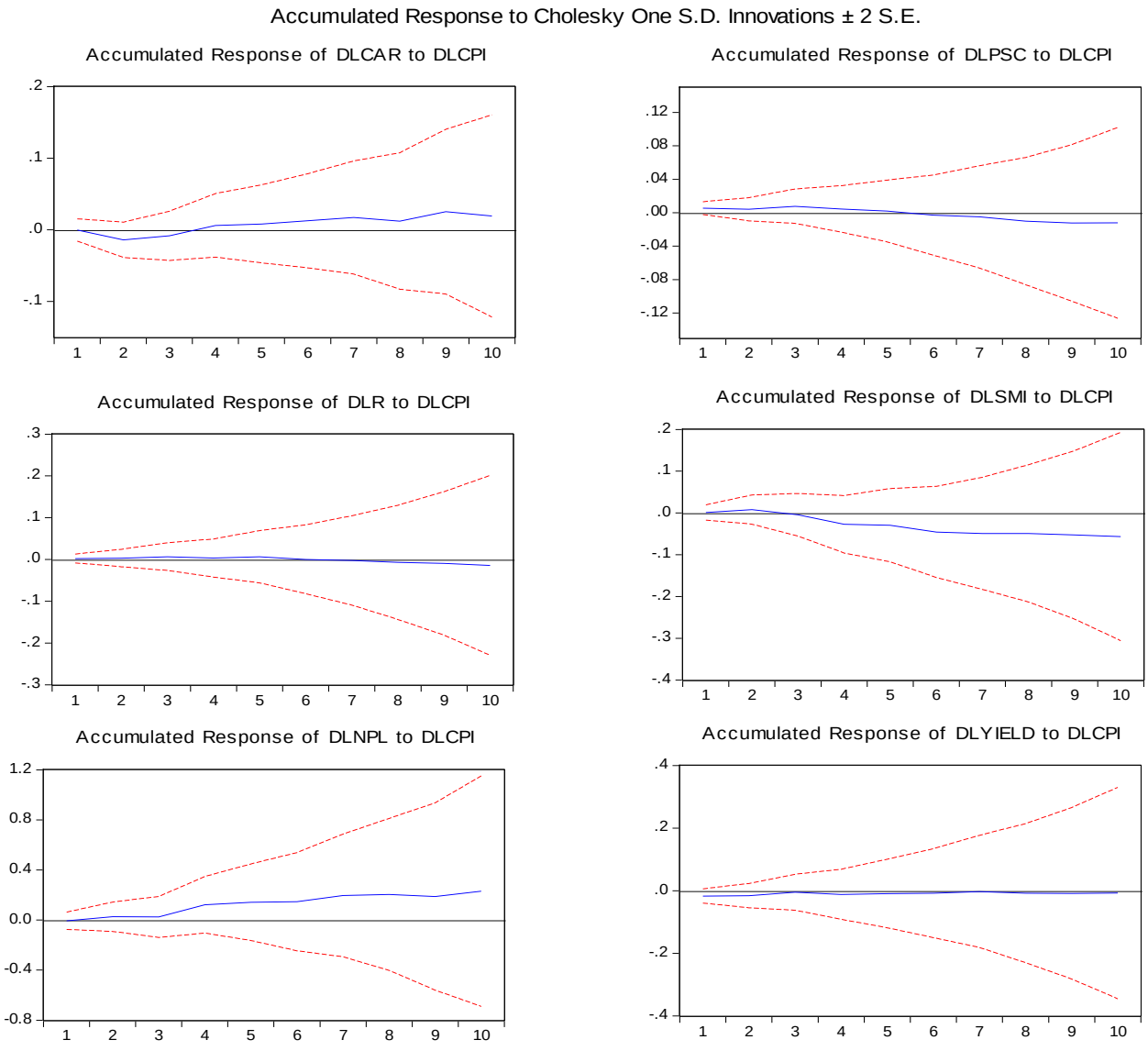
Using the Jarque-Bera, serial correlation and inverse AR roots tests, it was found that the model had normally distributed residuals, no serial correlation existed and the VAR model did not explode. The model therefore satisfies the various checks for model robustness.

[1] Orthogonality implies that $AA^T = I$ and $A^{-1} = A^T$.
[2] Non-identifiability implies the inability to distinguish among explanations of the responses.
[3] Entries outside the leading diagonal are non-zero.

5. Impulse Response

Impulse response functions are used to assess the relationship between both price and financial stability indicators. Firstly, a one standard deviation shock was applied using Monte Carlo simulations with 100,000 iterations to the measure of price stability (RPI) to examine the responses of the financial stability indicators in Trinidad and Tobago. Analysis revealed that a shock to the RPI had inconsequential for all variables. NPL had an initial shock, however, this decayed after several quarters.

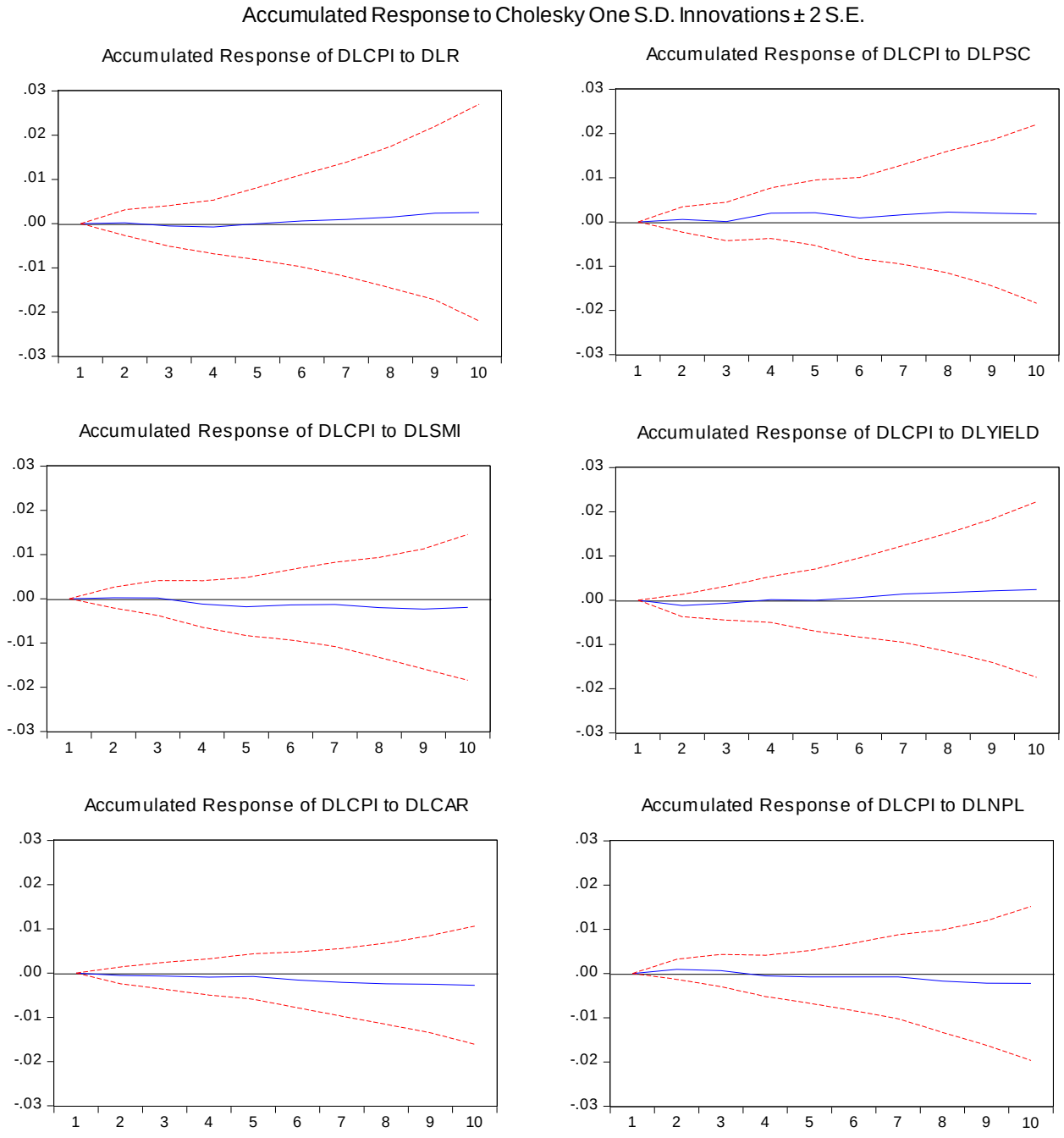
Figure 5: Response of Financial Stability to Shocks in Price Stability



Source: Authors' Calculation

Similarly, a one standard deviation shock was applied to the financial stability indicators to assess its impact on price stability. Similar to the response of financial stability to a shock in the RPI, shocks to the financial stability indicators has almost no impact on the RPI.

Figure 6: Response of Price Stability to Shocks in Financial Stability



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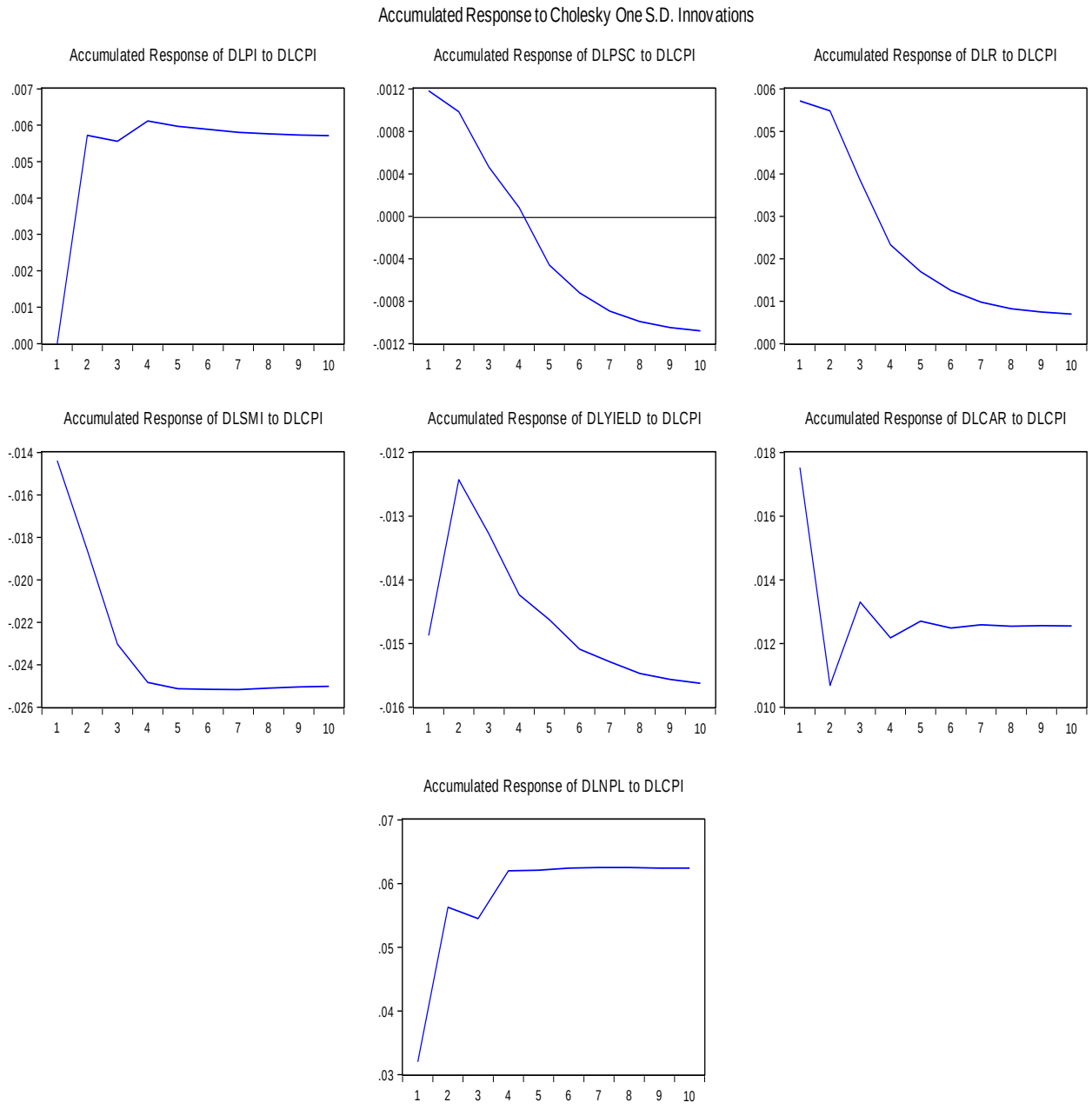
Bayesian VAR

With a reduced form VAR, when a dataset is not sufficiently large, the problem of over-parameterization or over-fitting the model can occur. To overcome this problem, one can adopt a Bayesian specification of the VAR model. According to Ciccarelli and Rebucci (2003), a Bayesian VAR can overcome the problem of over-fitting since it does not assign "too much weights on a particular value of the model parameters such as zero restrictions on certain parameters and as such, it is known to produce better forecast than a reduced form VAR". In estimating the Bayesian VAR, the choice of priors is extremely important to the researcher. One of the most renowned priors available is the Litterman/Minnesota (1986) priors. It assumes that the prior mean is near zero which avoids overfitting the model and the overall tightness of the variance should be small so as the prior information dominates the sample[4]. The Bayesian VAR was estimated using the same number of lag length as the reduced form VAR, that is, a lag length of three.

[4] See Ciccarelli and Rebucci (2003) for detailed technical analysis of the Bayesian VAR and priors.

A one standard deviation shock was applied to the price stability indicator (RPI) and the following responses were found. It can be seen that the accumulated responses after the second to fourth period, there was little response of the financial stability indicators to a price shock.

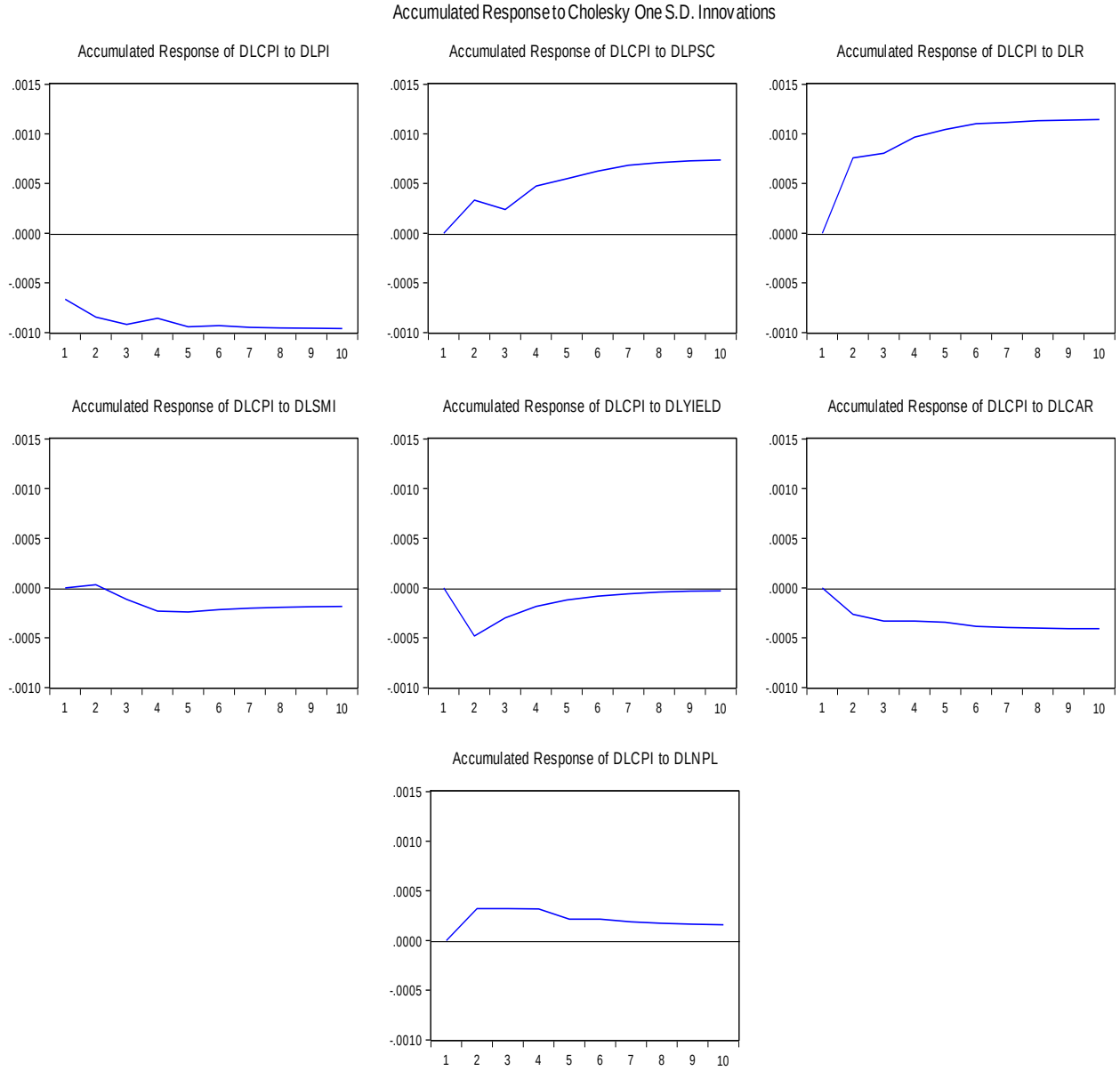
Figure 7: Response of Financial Stability to Shocks in Price Stability



Source: Authors' Calculation

Additionally, a one standard deviation shock was applied to the financial stability indicators and the accumulated response to the price stability variable was observed. Once again, it can be seen that after the second to fourth period, the accumulated responses plateaued this indicating little additional response to a financial stability shock as time progresses.

Figure 8: Response of Price Stability to Shocks in Financial Stability



Source: Authors' Calculation

6. Conclusion and Policy Implications

The aim of this paper was to estimate the relationship between price stability and financial stability using correlation analysis and VAR analysis between 2000 and 2015. Correlation analysis revealed that there was a moderate to high linear relationship between the various indicators. However, correlation does not imply causation since the Granger Causality test signaled that there was no causal relationship among the variables as well. This was followed by an estimation of a reduced form VAR model as well as a Bayesian VAR model and the relationships were analyzed through the use of impulse response functions. Both the reduced form VAR and the Bayesian VAR found that a shock to the price (financial) stability indicators did not lead to any significant response to the financial (price) stability indicators.

While the model produced those results based on data from the Trinidad and Tobago economy, the recent experience of the international financial crisis highlighted that the pursuit of financial stability cannot be divorced from the objectives of price stability. It is believed that a stable financial system will promote efficient investments and proper avenues for savings. This will in turn facilitate economic growth and reduce unemployment. A strong labour force will contribute to the balance sheets of corporations and households, further fostering financial stability. On the other hand, price stability allows for the allocation of resources in the economy and assists in price-setting within financial markets, which directly buttresses financial stability.

Despite the complementary nature of the policies, it must be kept in mind the balancing act that must be undertaken by Central Banks charged with this dual mandate, as these policies, if not monitored, can be counter-productive. For example, evidence from the crisis suggests that low inflation fostered asset price bubbles which lead to financial imbalances. This was exacerbated by the lack of regulation in financial systems, which engineered a credit boom and facilitated excessive leveraging.

Some policy makers believe in the 'benign neglect' approach where a Central Bank should focus on its primary objective of price stability i.e. inflation targeting and by extension growth and full employment, and allow financial stability to be distinctly addressed by prudential regulation or market discipline. In many instances post-crisis, financial stability has become a secondary mandate for some Central Banks or a primary mandate of a new regulatory authority within some countries.

However, an even more popular approach is "leaning against the wind". One interpretation of this approach, used by the European Central Bank among others, is that policymakers should monitor closely developments in asset prices and credit within the financial system and its risks to price stability. Therefore, financial stability becomes a secondary objective; with stabilizing growth in asset prices achieving long-run price stability.

In Trinidad and Tobago, one of the main objectives of the Central Bank's Monetary Policy is to promote price stability. While there is no explicit mandate in legislation for the Central Bank to promote financial stability, it is by far a widely accepted view, especially against the backdrop of the international and local financial crisis, that the Central Bank must consider the integral role of financial stability within the organization. A conditional coordinated approach is being recommended whereby price stability and financial stability should operate with a level of co-ordination while retaining their distinctive primary objectives respectively. In other words, in deliberating on price stability decisions, consideration should be given to the possible impact of desired policy direction on financial stability. On the other hand, the macroprudential policy tools developed under the umbrella of financial stability should target specific financial imbalances in the system while simultaneously not hampering the ability to meet the objective of price stability. Within the Central Bank, there should be clear institutional structures for achieving both price and financial stability, to ensure proper decision-making, accountability and communication. In some jurisdictions, this conditional coordinated approach is undertaken by a governing committee of the Central Bank which is established one tier above the price and financial stability structures.

In closing, financial stability policies are now becoming popular amongst central banks, therefore understanding the interactions of price and financial stability is a crucial piece of knowledge. Further, the interaction of microprudential and fiscal policies with price and financial stability also requires further investigation. In the end, the ultimate goal is to reduce the probability of systemic disruptions and minimize the unfavorable effects on the real economy.

References

Abu. W., S. Muhammad., and A. Pervez. 2001. "Inflation and Financial Sector Correlation: The Case of Bangladesh." MPRA 32925, pp.1-9.

Apostoaie,M. 2010. "Consideration on the Price Stability-Financial Stability Relationship in the Context of Financial Globalisation." Studies and Scientific Research, Economics Edition, 15, pp.6-13.

Arsene, M. and D. Guy-Paulin. 2013. "An Econometric Analysis of the Nexus between Credit to the Private Sector, Inflation and Economic Growth: Case of Cameroon 1965-2010." Global Journal and Management and Business Research Interdisciplinary, 13(7).

Blot, C., J. Creel., P. Hubert., and F. Labondance. 2015. "Assessing the Link between Price and Financial Stability." Journal of Financial Stability, 16, pp.71-88.

Bordo, M. and D. Wheelock. 1998. "Price Stability and Financial Stability: the Historical Record." Federal Reserve Bank of Saint Louis Review, September/October, pp. 41–62.

Cao, Q. 2014. "Inflation and Revaluation of Banks Balance Sheet." Department of Economics, Princeton University.

Christe,A. and I. Lupu. 2013. "The Central Bank Policy between Price Stability Objective and Promoting Financial Stability." Economics and Finance, 8, pp.219-225.

Ciccarelli, M., and A. Rebucci. 2003. "Bayesian VAR: A Survey of the Recent Literature and an Application to the European Monetary System." IMF Working Papers 02/102

Dickey, D., and W. Fuller. 1979. "Distribution of the Estimators for Autoregressive Time Series with a Unit Root." Journal of the American Statistical Association, 74, pp.427-431

Endut, R., N. Syuhada., F. Ismail. and W. Mahmood. 2013. "Macroeconomic Implications of Non-Performing Loans in the Asian Pacific Region." World Applied Sciences Journal, 23, pp.57-60.

Farhan, M., A. Sattar., A. Chaudry., and F. Khalil. 2012. "Economic Determinants of Non-Performing Loans: Perceptions of Pakistani Bankers." European Journal of Business and Management, 4(19), pp.87-99

George, E. 2015. "Monetary and Macroprudential Policy: Complements, not Substitutes." Financial Stability Institute/Bank for International Settlements Asia-Pacific High Level Meetings.

Gilchrist, S. and J. Leahy. 2002. "Monetary Policy and Asset Prices." Journal of Monetary Economics, 49, pp.75-97.

Hamilton, J. 1994. "Time Series Analysis." Princeton, NJ: Princeton University Press.

Korkmaz, S. 2015. "Impact of Bank Credit on Economic Growth and Inflation." Journal of Applied Finance and Banking, 5(1), pp.57-69.

Kunt, A. and E. Detragiache. 1998. “The Determinants of Banking Crises in Developed and Developing Nations.” IMF Staff Papers, 45(1), pp.81-109.

Kwiatkowski, D., P. Phillips, P. Schmidt., and Y. Shin. 1982. “Stationarity Against the Alternative of a Unit Root.” Journal of Econometrics, 54, pp. 159-178.

Phillips, P., and P. Perron. 1988. “Testing For Unit Roots in Time Series Regression.” Biometrika, 75, pp. 335-346.

Schinasi, G. 2004. “Defining Financial Stability.” IMF Working Paper 04/187.

Smets, Frank. 2014. “Financial Stability and Monetary Policy: How Closely Interlinked?” International Journal of Central Banking, pp.263-300.

Van Den End, J. 2010. “Trading of Monetary and Financial Stability: A Balance of Risk Framework.” DNB Working Papers 249, Netherlands Central Bank.

Yildirim, Z. 2015. “Relationship among Labour Productivity, Real Wages and Inflation in Turkey.” Economic Research-Ekonomska Istraživanja, 28(1), pp.85-103.

Younus, S. 2010. “Nexus among Output, Inflation and Private Sector Credit in Bangladesh.” Research and Policy Department, Bank of Bangladesh.