Do inflation expectations matter for small open economies? Empirical evidence from the Solomon Islands

Vitarina H Takana Central Bank of Solomon Islands
Angeline H Bata'anisia Central Bank of Solomon Islands
Tarlok Singh Griffith University
Jen-Je Su Griffith University
Parmendra Sharma Griffith University

GRIFFITH UNIVERSITY–SOUTH PACIFIC CENTRAL BANKS JOINT POLICY RESEARCH WORKING PAPER SERIES

Griffith Asia Institute

Griffith University–Central Bank of Solomon Islands JPRWP#9

Griffith Asia Institute

Griffith University–South Pacific Central Banks
Joint Policy Research Working Paper Series

Do inflation expectations matter for small open economies? Empirical evidence from the Solomon Islands

Vitarina H Takana[a], Angeline H Bata'anisia[a],
Tarlok Singh[b,c], Jen-Je Su[b,c]
and Parmendra Sharma[b,c]

[a] Central Bank of Solomon Islands
[b] Department of Accounting, Finance and Economics, Griffith University
[c] Griffith Asia Institute, Griffith University

About the Griffith Asia Institute

The Griffith Asia Institute (GAI) is an internationally recognised research centre in the Griffith Business School. GAI aims to be the informed voice leading Australia's strategic engagement in the Asia Pacific by cultivating knowledge, capabilities and connections that will inform and enrich Australia's Asia-Pacific future.

GAI's focus is on conducting and supporting excellent and relevant research on the politics, security, economies and development of the Asia-Pacific region; facilitating effective partnerships and policy outcomes for positive impact in the region; leading and informing public debate on Australia's place in the Asia Pacific; and shaping the next generation of Asia-Pacific leaders.

The Institute reflects Griffith University's longstanding commitment to the study of and engagement with nations of Asia and the near Pacific.

About this publication

The Joint Policy Research Working Paper Series endeavours to disseminate the findings of work in progress to academics, governments and the public at large to encourage the exchange of ideas relating to the development of the South Pacific financial sector and thereby national economic growth and development. The papers carry the names of the authors and should be cited accordingly. The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors and do not necessarily represent the views of the partner Bank or Government.

Disseminating findings quickly, even if work is still in draft form, is expected to encourage early and wider debate.

This joint Central Bank of Solomon Islands—Griffith University working paper is part of an ongoing extensive research capacity building program led by Griffith University for the South Pacific central banks.

The texts of published papers and the titles of upcoming publications can be found on South Pacific Centre for Central Banking page on the Griffith Asia Institute website: www.griffith.edu.au/asia-institute/our-research/south-pacific-centre-central-banking

'Do inflation expectations matter for small open economies? Empirical evidence from the Solomon Islands', Griffith University–South Pacific Central Banks Joint Policy Research Working Paper No. 9, 2019.

About the Authors

Vitarina H Takana

Mrs Takana worked for the Central Bank of Solomon Islands (CBSI) since 2010, heading the Research Unit. Mrs Takana earned her Bachelor of Art degree, majoring in Economics and Land Management in 2003 at the University of the South Pacific. She later pursued her further studies and attained her Masters in Economics from Waikato University, New Zealand in 2010. Since then Mrs Takana worked for the Central bank as a Real Sector Analyst for 5 years and promoted to head the Research Unit for another 4 years. She was appointed to higher responsibilities as acting manager role for nine-months while conducting research task for the bank. In terms of working papers, Mrs Takana was also involved in writing other working papers that were co-authored with CBSI colleagues and Griffith University.

Angeline H Bata'anisia

Angeline Bata'anisia works as a Research Analyst for the Research Unit under the Economics Research and Statistics Department of the Central bank of Solomon Islands. Since joining the bank in 2017 she also worked for a year as an acting Senior Analyst for the Real Sector Unit. She holds an Honours Degree in Applied Economics from Massey University, New Zealand. Her research interests include: development economics, financial sector development and economic growth and public policy.

Tarlok Singh

Associate Professor Tarlok Singh's teaching expertise includes interest rate, money and central banking, international economics, intermediate macroeconomics, advanced macroeconomics, macroeconomic policy analysis, applied econometrics, and financial economics. He has published a number of research papers in the areas of macroeconomic modelling and economic growth. Associate Professor Singh has been as a manuscript referee for a number of international journals. His primary research interests are in the area of open economy macroeconomics, applied econometrics, economic growth and development, money and financial economics.

Jen-Je Su

Dr Jen-Je Su is a Senior Lecturer in the Department of Accounting, Finance and Economics at Griffith University. He has training in economics and econometrics and significant experience in econometric modelling. Before joining Griffith, he had worked in several academic institutions across Taiwan, USA, and New Zealand. Dr Su has published intensively in the areas of time-series econometrics, international finance, economic development and tourism in academic journals.

Parmendra Sharma

Dr Parmendra Sharma is a senior lecturer and the program convenor of the South Pacific Centre for Central Banking at Griffith University. His publications are beginning to fill the huge vacuum in the literature relating to South Pacific's financial sector, including on issues such as determinants of bank interest margins, profitability and efficiency. His recent publications include Factors influencing the intention to use of mobile value-added services by women-owned micro enterprises in Fiji), Microfinance and microenterprise performance in Indonesia (International Journal of Social Economics), A first look at the trilemma vis-à-vis quadrilemma monetary policy stance in a Pacific Island country context, (Review of Pacific Basin Financial Markets Policy), Mobile value added services in Fiji: Institutional drivers, industry challenges and adoption by women micro entrepreneurs (Journal of Global Information Management) and Bank reforms and Efficiency in Vietnamese Banks: Evidence based on SFA and DEA (Applied Economics).

Contents

Abstract

This is the first study to examine the dynamics of inflation expectations in Solomon Islands, using the Hybrid New Keynesian Phillips Curve framework and quarterly data for the period 2003-2017. The estimation uses the standard Ordinary Least Squares, the General Method of Moments and the Fully Modified Ordinary Least Squares methods. The study finds that both backward-looking and forward-looking behaviour of firms matter for inflation. The study also finds that fuel prices, output gap and real effective exchange rate are important indicators of current inflation. Policy implications are discussed.

Keywords: Inflation, Phillips Curve, Solomon Islands

1. Introduction

Assessing inflation expectations as early and as precisely as possible for appropriate, proper and timely action has traditionally been a primary role of central banks worldwide. At the same time, the assessment itself has always been challenging for the monetary authorities since inflation expectations are not directly observable, requiring a need to turn to suitable indicators for assessment instead such as surveys, extractions from yield curves and inflation-linked bonds (Tomfort, 2011). Moreover, central banks have often pondered on the question of whether expectations follow predominantly a forward-looking or backward-looking behaviour of firms. This question is important ultimately for the optimal monetary policy stance, via a process of understanding the different sources of inflation persistence and the costs of disinflation mechanisms (Dorich, 2009).

The empirical evidence here has been mixed. Some studies find a predominantly forward-looking behaviour of firms (Sakurai, 2016; Meng, 2016; Hervino, 2015; Gali & Gertler, 1999) while others argue that the backward-looking behaviour is more prominent (Tomfort, 2011; Mukhtar & Yousaf, 2014). These studies span across many years, countries and regions but have largely ignored the case of the Pacific Island Countries (PICs)—small, vulnerable, open economies. This study, therefore, using the case of Solomon Islands, attempts to fill that gap in literature. We do this using the Hybrid New Keynesian Phillips Curve (HNKPC) framework. The model is estimated using quarterly data for the period 2003-2017. The estimation is conducted using the standard Ordinary Least Squares, the General Method of Moments and the Fully Modified Ordinary Least Squares methods. The study finds that both backward-looking and forward-looking behaviour of firms matter for inflation. The results show that fuel prices, output gap and real effective exchange rate are important indicators of current inflation. Policy implications are discussed.

The rest of the paper is organised as follows. Section 2 provides the study context. Section 3 provides the review of the literature. Section 4 discusses the model, methodology and data. Section 5 presents the empirical results. Section 6 concludes with some policy implications.

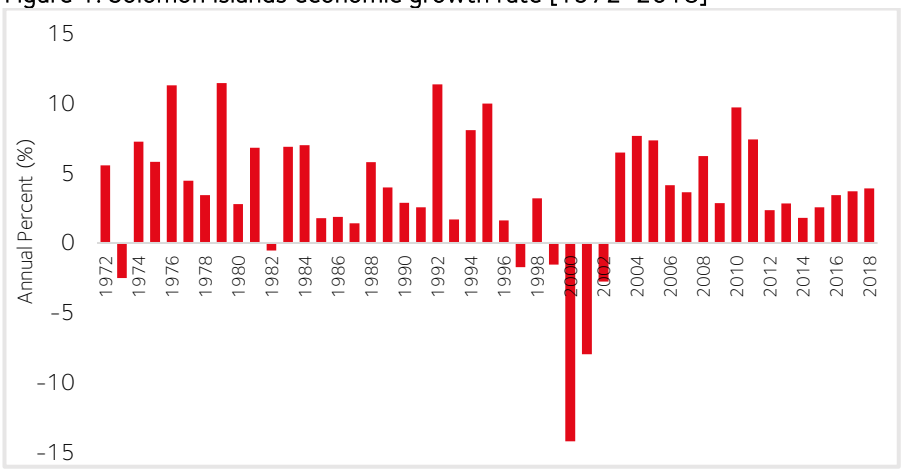
2. Study context: Macroeconomic performance and inflation

2.1 Solomon Islands economy: An overview

Solomon Islands is a small island open economy with population of around 652,858[1]. It is located North East of Australia and lies in an archipelago encompassing over 28,000 square kilometres of land area. It accommodates many scattered islands, with a total of 10 provincial centres including Honiara, the capital city. It is a country of multi-cultural and diverse ethnicity. Since gaining its independence in 1978, the Solomon Islands economy has made reasonable progress in certain areas of its development, however it has struggled to provide the basic and adequate infrastructure development for its people. Its geographically scattered islands is a major constraint for its planned developments and service delivery coupled with poor planning at the top hierarchy level.

Solomon Islands' economic growth has generally been low and volatile in the last four decades due to a wide range of external and internal shocks (Figure 1). In the 1970s, Solomon Islands experienced robust growth, recording an average growth of 5.8 per cent predominantly supported by the agriculture and fishing sectors. However, growth has gradually declined over the decade, falling to 3.8 per cent in the period 1981–1990 and falling substantially to 1.2 per cent over the period 1991–2001. The peak in 1984 and 1992 was driven by fish and log productions respectively.

Figure 1: Solomon Islands economic growth rate [1972-2018]



Source: Solomon Islands National Statistics Office (SINSO) & Central Bank of Solomon Islands (CBSI). Economic Growth rates for 2017 and 2018 are estimates by CBSI, others are actuals by SINSO.

The declining trend seen since 1996–2002 is a culmination of factors namely, unfavourable seasons in the agriculture and fishing sectors, the Asian Financial Crisis in 1997 that affected the country's log exports and the period of political instability from 1999 to 2002. The economy was badly affected by the civil unrest between 1999–2002, which led to contraction of the economy, recording an average growth of negative 6.7 per cent over the period. The four years of conflict disrupted the narrowed-based production of the country and brought the country to an accumulated debt which triggered acute fiscal deficit balances.

In July 2003, the arrival of the Regional Assistance Mission to the Solomon Islands (RAMSI) led to restored law and order, increased business confidence coupled with the injection of donor inflows towards the country's post-conflict recovery efforts. All of these enabled the economy to a stable footage again. As such, the economy entered a period of recovery from 2001 to 2008, with growth emerging out of the negative territory post RAMSI's arrival to register an average growth of 3.1 per cent from 2001 to 2008. Conversely, in 2009, economic growth contracted sharply to 2.9 per cent following the global economic recession in late 2008 reflecting the slow down in global demand. The peak in 2010 was due to the opening of Gold Ridge Mining while the slight down-turn in growth in 2014 was atributed to the April Flash Floods that disrupted business activities in the capital. In the recent years, economic growth continued to pick up progressively, averaging at 3.5 per cent over the period 2011-2018.

Solomon Islands is a lower middle income country with a per capita income of US$1,477 (2018); comparable countries in the region thus include Papua New Guinea, Samoa, Tonga and Vanuatu. According to the latest report by the UNDP (2018), Solomon Islands is classified in the Low Human Development Index (HDI) group (ranking 152 out of 189 countries) and ranks lower than the average of the East Asia and the Pacific region of 0.733 and other PICs like Fiji (ranking 92), Tonga (ranking 98), Samoa (ranking 104), Vanuatu (ranking 138), although slightly higher than Papua New Guinea (ranking 153) (see Table 1).

Table 1: Economic development indicators

Country	GDP per capita (2018)	Population (2018)	HDI Category	World Bank Income Classification
Solomon Islands	1477	652858	0.546 (Low)	Lower Middle Income
Fiji	4856	883483	0.741 (High)	Upper Middle Income
Papua New Guinea	2400	8606316	0.544 (Low)	Lower Middle Income
Samoa	3894	196130	0.713 (High)	Lower Middle Income
Tonga	4054	103197	0.726 (High)	Lower Middle Income
Vanuatu	2863	292680	0.603 (Middle)	Lower Middle Income

Source: For comparison purposes other country data collected from World Development Indicators, The World Bank, 2019. HDI sourced from United Nations Development Programme, 2018. Notes: (1) GDP per capita in 2018 is at constant prices (2010 US$); (2) HDI: Human Development Index.

Solomon Islands has a high import dependancy and a narrow export base, dominated by primary commodities of round logs, fish, palm oil, cocoa and copra. The country's forestry sector continues to drive economic growth with log export receipts a major source of export earnings and revenue for the Government totalling $2,949 million and $749 million respectively in 2018. In the past decades, logging continues to occur at a grossly unsustainable level, with log volumes reaching a peak of 2.734 m^3 in 2018. However, this is expected to be short-lived, following the fall in log prices in 2019 and the implementation of the Government's new sustainable logging policy in 2019/2020, wherein logging activities are expected to decline over the medium term. This presents critical challenges for the overnment to diversify and invest in other sources of growth.
Following RAMSI's departure in 2017 and the Government's challenge to diversify its economic base coupled with its proposed developments in terms of government expenditure and borrowing are of major concern and needs to be investigated. This is because all these macroeconomic activities can lead to inflation in the medium to long term. That relates to this paper on investigating whether or not inflation expectations matters for the present decision of households, firms and government.

2.2 Inflation—measurement and trends

Inflation — some conceptual underpinnings

The most well-known indicator of inflation in Solomon Islands is the Honiara Consumer Price Index (HCPI) formerly known as the Honiara Retail Price Index (HRPI), which measures the average price changes in the price levels of a basket of goods and services purchased by households in Honiara (country proxy) at a specific time relative to the base year (SINSO, 2018). Currently, the headline inflation rate in Solomon Islands is calculated based on a three-months moving average.

In the last four decades, the HCPI has been rebased several times and have undergone structural developments to its composition. Since, the late 1970s, the HRPI[2] was the most closely monitored indicator of inflation in the country for which the consumption basket was derived from a household survey conducted in 1977 (CBSI, 1988). This consumption basket consisted of six main categories including food, drink and tobacco, clothing, housing and utilities, transport and miscellaneous component. In the late 1980s, the HRPI was later split into Imported and Other Items as measures of imported and domestically sourced inflation respectively. In 2007, the HRPI was rebased by the Solomon Islands National Statistics Office (SINSO) to a new base period of the 4th Quarter of 2005. The changes included an updated consumption basket to accurately reflect consumer patterns as well as an expansion of the HCPI basket to include two additional categories namely 'transport and communication' and 'recreation and health', resulting in a total of eight main categories (CBSI, 2007). Consequently, this also led to a re-weighting of the main categories within the basket, while food and housing utilities still accounted for higher weights within the HCPI (see Table 2).

More recently, the HCPI Series 3[3] was introduced in July 2018, using data from the latest Household Income and Expenditure Survey (HIES) 2012/ 2013. The basket was revised to reflect an updated basket of goods and services covering 205 items compared to 187 items in the prior series. The consumption basket was also revised to align with the United Nations Classification of Individual Consumption According to Purpose (COICOP) categories used in the HIES. Thus, the consumption basket was increased from eight to twelve main categories (see Table 2). Accordingly, the new series is now more comparable to the other PICs also using the COICOP categories such as Fiji and Samoa.

Table 2: Evolution of Honiara Consumer Price Index composition

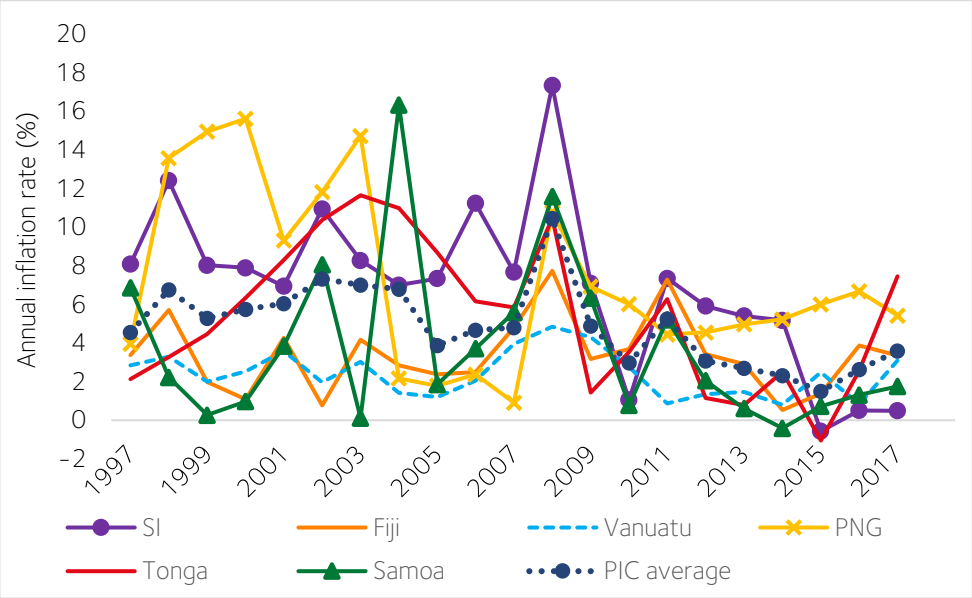
HRPI		HCPI Series 2		HCPI Series 3	
Q4 1977=100, Rebased 1985=100		Q4 1992 = 100 Rebased Q4 2005=100		Q4 2013=100	
Categories	Weights	Categories	Weights	Categories	Weights
Food	470	Food	429	Food & non-alcoholic beverages	33.3
Drink & tobacco	95	Drink & tobacco	47	Alcoholic beverages & tobacco, narcotics	12.6
Clothing	50	Clothing & footwear	38	Clothing & footwear	2.6
Housing & utilities	155	Housing & utilities	181	Housing, water, electricity, gas & other fuels	16.9
Transport	110	Household operations	47	Furnishing, household, equipment, routine, household maintenance	2.9
Miscellaneous	120	Transport & communications	164	Health	0.3
		Recreation & others	76	Transport	18.2
		Miscellaneous components	18	Communication	6.3
				Recreation & culture	1.3
				Education	2.7
				Restaurants & hotels	1.5
				Miscellaneous goods & services	1.5
Total	1000		1000		100

Source: SINSO and CBSI.

Trends in inflation

Inflation movements in the Solomon Islands, like many other PICS is volatile as the economy is vulnerable to shocks originating from both domestic factors and pass through from external developments (see Figure 2). As a developing and small open economy that relies on tradable and consumable goods like food and fuel, it is highly exposed to price shocks in the global market. Whilst on the domestic front, it is highly susceptible to supply shocks such as natural disasters affecting the supply of domestically produced goods and services. In late 2008, inflation in the PICs averaged around 10% stemming from high food and fuel prices in the global market following the 2008 Global Financial Crisis (see Figure 2).

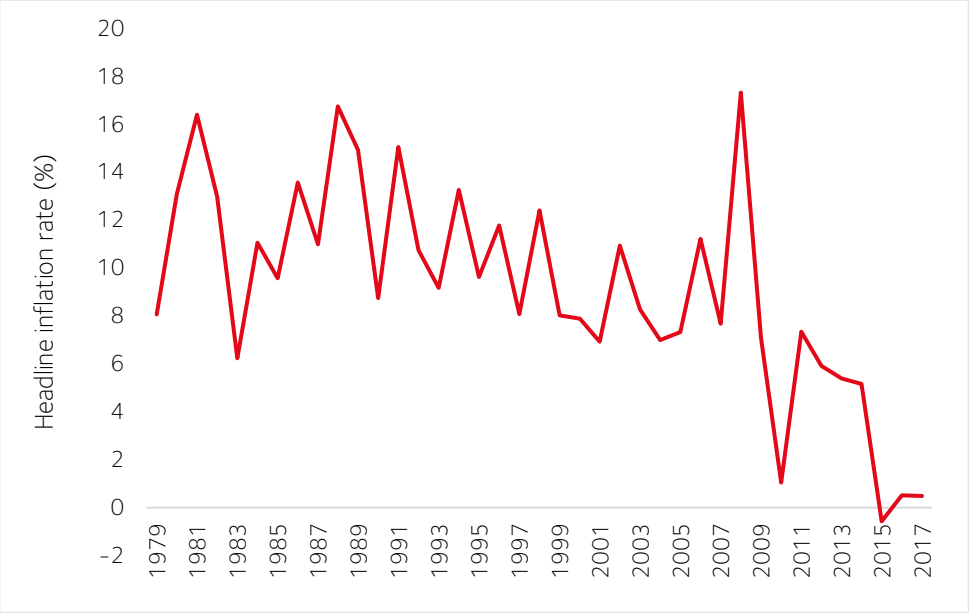
Figure 2: Annual rates of inflation in PICs [1997-2017]



Source: World Data (2018).

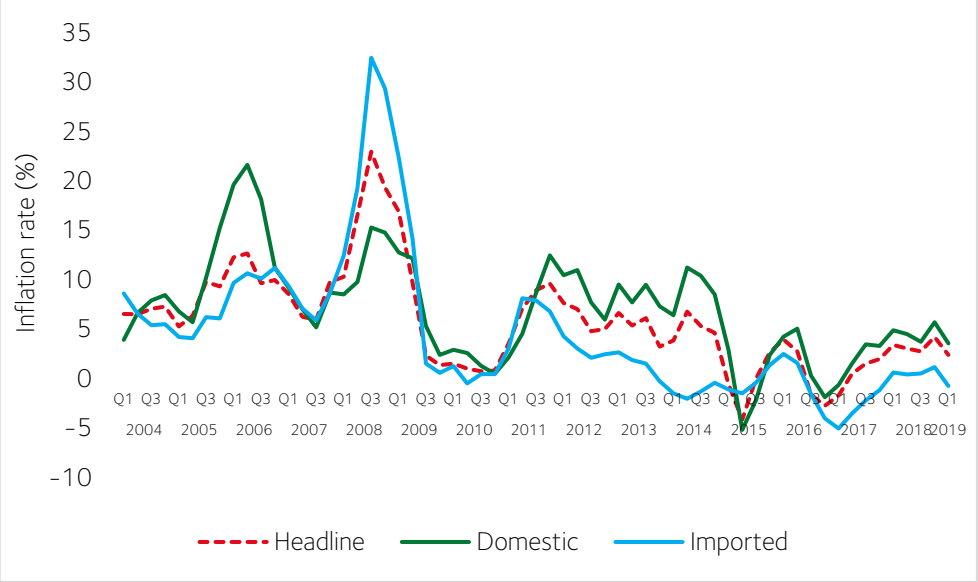
In the early 1990s, the average inflation rate was at 11 per cent driven mainly by domestic inflation (see Figure 3). In the later part of the decade, which is marked by the periods of the ethnic unrest from 1999 to 2002, average inflation went down to 8.4 per cent driven by imported inflation reflecting sluggish demand that existed during the crises. During the aftermath of the crises, between 2004-2008, average inflation surged again to 10.1 per cent, equally driven by both imported and domestic inflation. The spike in imported inflation was attributed to the commodity price boom in early 2008 followed by the decline in imported prices during the global financial crisis as external demand waned. Whereas, the increase in domestic inflation was underpinned by price rises in food due to supply shortages in the market (see Figure 4).

Figure 3: Annual headline rate of inflation in Solomon Islands [1979-2017]



Source: World Data (2018).

Figure 4: Headline, imported and domestic inflation rates in Solomon Islands, 2004Q1-2019Q1



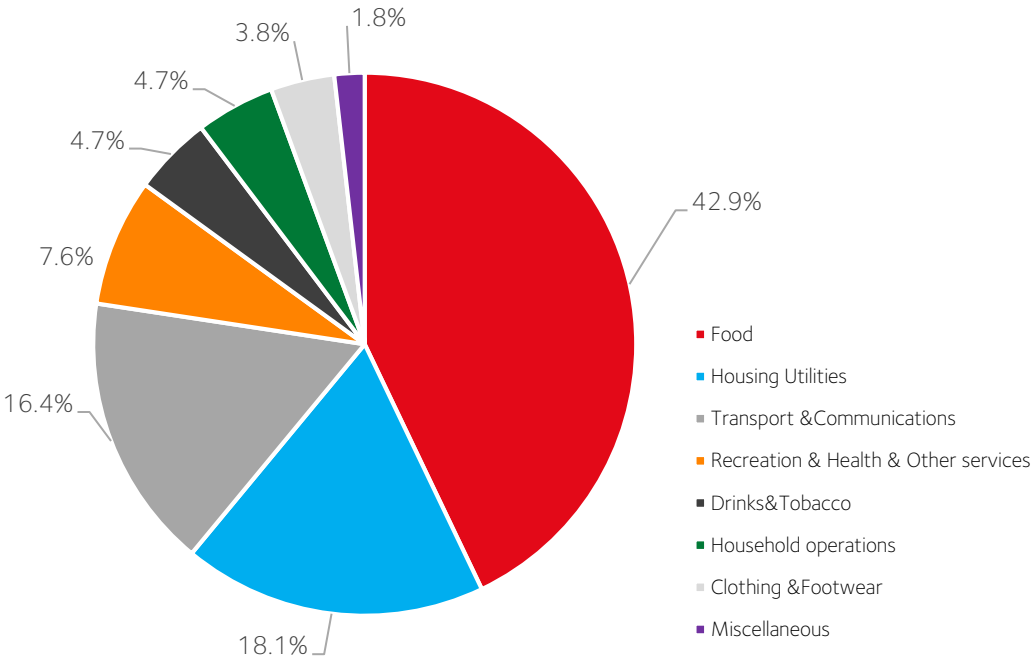
Source: SINSO.

Moreover, the average inflation rate dropped to 5.4 per cent over the period 2009-2013 reflecting price falls in both imported and domestic inflation. This downward trajectory continued into recent periods with the average inflation rate recorded at below 2 per cent, which stemmed from domestic component whilst imported inflation has fallen and remained subdued to below zero as imported prices continued to ease (see Figure 4) .

Measures and targets

Inflation in the Solomon Islands is currenlty measured on a monthly basis by the SINSO. Whilst, the latest revised HCPI Series 3 basket consists of 12 new categories (see Table 2), the HCPI basket used for this study consists of eight categories with food category accounting for the highest weight (42.9 per cent) followed by housing and utilities (18.1 per cent), transport and communication (16.4 per cent), recreation (7.6 per cent), drinks and tobacco (4.7 per cent), household operations (4.7 per cent), clothing and footwear (3.8 per cent) and miscellaneous (1.8 per cent) (see Figure 5).[4] Similarly, most PICs have relatively high weights of food, transportation and housing utilities in their CPI baskets.

Figure 5: HCPI (2005 Q4) categories and weights



Source: SINSO.

While the Central Bank's primary objective is to maintain domestic price stability, there is no specific reference value or policy guideline, such as in the case of Australia (2–3 per cent), for managing the inflation rate. Nonetheless, there is a broad expectation that the rate should be within 3–5 per cent .

In summary, economic growth have been low and volatile in the past decades reflecting the country's vulnerability to external and internal shocks. While the country has made reasonable progress in terms of economic growth, socio-economic development challenges persist. Inflation on the other hand, has become relatively low in recent years however, still susceptible to shocks on the domestic and external fronts. Thus, monitoring inflation developments is important for such a small island, vulnerable open economy and for achieving monetary policy's primary objective of price stability.

3. Literature review

This section provides a review of the literature relating to the study. It begins with an overview of the relevant economic theories used in estimating inflation dynamics, followed by a review of various Hybrid New Keynesian Phillips Curve (HNKPC) related empirical studies focusing on the coverage, elements of the HNKPC model and the role of inflation dynamics in shaping inflation expectations.

3.1 HNKPC and the small open economy: An overview of the theory

The Hybrid New Keynesian Phillips Curve (HNKPC) developed by Gali & Gertler (1999) has become a widely used framework for estimating short-run inflation dynamics. The model is an extension of the NKPC model, which assumes a purely forward-looking inflation expectations as well as accounts for a backward-looking component for determining current inflation rates (Mavroeidis, Moller -Plagborg, & Stock, 2014). It is well established on sound microeconomic foundations, originating to the prominent A.W Phillips Curve (1958) and the price adjustment Calvo model (1983)[5].

The HNKPC framework estimates the development of the inflationary process by relating current inflation rates to lagged inflation (backward-looking component), future inflation (forward-looking component) and an inflationary gap pressure such as marginal cost or output gap (Gali & Gertler, 2000; Gali, Gertler, & Lopez-Salido, 2005; Tomfort, 2011). The results of Gali & Gertler (1999) provide empirical support for the forward-looking process as more dominant than the backward-looking behaviour in the formation of current inflation rates. However, Rudd & Whelan (2001) and Linde (2005) have raised criticism with respect to the model's estimates as products of specification bias and that the results produced are non- robust. In response to these criticisms, Gali, Gertler, & Lopez-Salido (2005) have found robust evidence using estimation procedures including the GMM closed form and non-linear variables to confirm the initial findings of Gali & Gertler (1999).

In recent decades, the HNKPC has evolved to include an open economy version of the HNKPC model. Leith & Malley (2003) have developed an open economy model of a firm's pricing behaviour under imperfect competition while Gali & Monacelli (2005) have designed a small open economy version of the HNKPC that assumes a small open economy that makes up the world economy. In both frameworks, an element of the open economy was included in the HNKPC model using an openess parameter namely terms of trade or an exchange rate variable under varying levels of assumption.

3.2 HNKPC: The empirical studies

Geographical coverage of studies

The empirical studies that applied the HNKPC to estimate inflation dynamics have emerged mainly from developed countries (Gali & Gertler, 1999; Tomfort, 2011; Dufour, Khalaf, & Kichian, 2005; Abbas K. S., Bhattacharya, Mallick, & Sgro, 2016) and emerging economies (Meng, 2016; Sakurai, 2016; Mukhtar & Yousaf, 2014; Ishak-Kasim & Ahmed, 2010). Whilst a dearth of empirical studies exists in small island economies especially in the case of PICs. Moreover, existing studies have found mixed results in terms of their relevance in explaining the inflation dynamics of the countries studied.

The initial work of Gali & Gertler (1999) have developed and estimated a structural model for the United States of America (USA), wherein the findings indicate that the HNKPC

provides a good approximation to inflation dynamics of the USA. Similarly, Tomfort (2011) reaffirms empirical support for the use of the HNKPC in measuring the role of inflation expectations in the USA and Germany. Furthermore, Dufour, Khalaf, & Kichian (2005) assesses the empirical adequacy of the HNKPC in the case of USA and Canada by using two variants of the model, one using rational expectations assumptions and the other based on inflation expectations survey data. Although the framework is applicable for the USA, it does not provide empirical support for explaining Canada's inflation dynamics partly reflecting data compatibility issues with the Canadian data.

Moreover, in emerging economies, a study by Sakurai (2016) examines the validity of the HNKPC in Thailand over two periods of large economic crisis namely in 1997 and 2009. The study provides empirical evidence for explaining the inflation dynamics of Thailand over the period studied. Moreover, a study by Mukhtar & Yousaf (2014) investigates whether the inflation dynamics in Pakistan can be explained by the NKPC and HNKPC models. The findings of their study confirmed the role of both models in explaining the inflationary process in Pakistan. Similarly, a study by Hervino (2015) provides evidence for the relevance of the HNKPC in explaining the inflationary process in Indonesia.

Furthermore, a study by Maturu, Kisinguh, & Maana (2006) considers whether the NKPC is applicable to the Kenyan data under different assumptions of technology. Similary, a study by Leshoro & Kollamparambil (2016) examines whether a stable NKPC exists in South Africa by testing whether inflation expectations in South Africa is forward-looking or backward-looking? Similarly, in Singapore, Meng (2016) applies the HNKPC by incorporating openess variables, namely terms of trade and relative wage to assess the inflation processes in Singapore. This study provides evidence for the use of the HNKPC in explaining Singapore's inflationary process as critical for informing its monetary policy. Another study by Domic (2012) reviews the inflation dynamics of Croatia by applying a variant of NKPC model combinations and was found to be effective in modelling inflation dynamics in Croatia.

Other studies have applied various open economy versions of the HNKPC in estimating inflation dynamics and have found mixed results. A study by Leith & Malley (2003) estimates an open economy version of the HNKPC for G7 economies and finds that similar to the closed economy version of the HNKPC, the formulated open economy model is supportive in explaining the inflation dynamics of the countries studied. Moreover, a study by Mihailov, Rumler, & Scharler (2011) which analyses the inflation dynamics in the case of 10 OECD countries, employs the Gali & Monacelli (2005) model and finds empirical support for the role of small open economy as measured by the terms of trade in explaining inflation dynamics in the countries examined. Similarly, a small open economy NKPC model was applied for the Israeli economy and adquately explained the inflation dynamics of the Israeli economy under the inflation targeting regime from 1995-2006 (Binyamini, 2007). Conversely, the findings of a study by Abbas, Bhattacharya, Mallick, & Sgro (2016) suggests that the inflation dynamics of Australia cannot be explained by the small open economy model by Gali Monacelli (2005). The outcome can be attributed to various factors such as invalid assumption of complete exchange rate pass through effect in the case of Australia and weak uncertainty sampling uncertainty due to weak identification.

Elements of HNKPC

The second feature of the literature explores the elements of a HNKPC. Conventional variables used to estimate a HNKPC include both rational forward-looking inflation expectations and lagged inflation values (Gali & Gertler, 1999) largely derived from the CPI data and an inflationary demand pressure gauged by a nominal marginal cost and or output gap. The selection of the variables are dependent on data availability, significance of the variable in the model, the relevance of the country specific variables and the approach undertaken.

The measure for inflationary pressure in the HNKPC varies considerably across the empirical studies reviewed. Most studies have used marginal cost in the HNKPC model by following closely the work of Gali & Gertler (1999), Meng (2016) and Gali, Gertler, & Lopez-Salido (2005) in place of the output gap. The rationale for the preferred use of marginal cost relates to measurement uncertainties arising from the use of the output gap (Gali & Gertler, 1999; Leith & Malley, 2003) and in other cases the output gap variable does not perform well (Gali, Gertler, & Lopez-Salido, 2005). Conversely, other studies (Sakurai, 2016; Hervino, 2015; Mukhtar & Yousaf, 2014) have incorporated an output gap variable as an indicator used for measuring the level of economic acitivty due to the non-availability of marginal cost data (Mukhtar & Yousaf, 2014). Whereas, others have utilised an output gap as a direct measure of inflationary pressure as preferred by Central Banks (Tomfort, 2011). Notwithstanding these, a few studies have incorporated both marginal cost and output gap in the HNKPC model to ascertain the variable that produces the more robust and meaningful results (Domic, 2012; Maturu, Kisinguh, & Maana, 2006). In other instances, a dummy variable was used to capture the period of country specific crisis (Sakurai, 2016) while others captured external shocks namely oil price and the global financial crisis (Hervino, 2015; Leshoro & Kollamparambil, 2016).

For open economy versions of the HNKPC, empirical studies have applied various openess parameters to capture the influence of the external sector upon the current inflation rates. In the case of Singapore, inflation dynamics was modelled using a variation of marginal cost variables instead of the output gap, which consisted of relative wage, terms of trade, labour share in GDP and aggregate output in addition to the forward-looking and backward-looking components. Their results revealed the significance of the labour share and aggregate output in the HNKPC model. Meanwhile, the relative wage and terms of trade coefficients were not statistically significant at the conventional level although they obtained the correct signs and were economically significant. Similary in Croatia, an open economy version of the HNKPC model was used to model the short-run inflation dynamics by incorporating a marginal cost variable that captured the price of imported intermediate goods and the output gap. Similary, Leith & Malley (2003) have formulated a model for capturing the firm's pricing decision by including a terms of trade effect influencing the firms pricing decision.

Furthermore, several studies have adopted the Gali-Monacelli NKPC (2005) to estimate inflation dynamics by including an openess parameter to capture the effect of the small open economy through the use of real exchange rate or terms of trade variable. A variant of Gali-Monacelli NKPC models were used to estimate the inflation dynamics for Australia, namely combinations of terms of trade and real exchange rate versions with marginal cost and output gap also employed in the model. Similarly, in Mihailov, Rumler, & Scharler (2011), the study uses external macro variables namely terms of trade and marginal cost that was constructed using both domestic and imported component and an output gap variable.

Inflation dynamics: Is it a forward-looking or backward-looking process?

The HNKPC is primarily used to ascertain the role of inflation expectations in the inflation development process, whether inflation dynamics is predominately a forward-looking or backward-looking process. This information is important for Central Banks in forecasting inflation rates and providing insights into the appropriate inflation regime for the country (Cunningham, Desroches, & Santor, 2010). The forward-looking behaviour is largely associated with well anchored inflation expectations for which these countries have adoped an inflation targetting regime, while countries with high persistence in inflation expectations are known to form inflation expectations in a backward-looking manner.

The forward looking behaviour appears to be a key determinant of inflation dynamics in the reviewed studies (Sakurai, 2016; Meng, 2016; Hervino, 2015; Gali & Gertler, 1999). Following on from the inital work of Gali & Gertler (1999), forward looking inflation expectations is more significant than the backward-looking inflation expectations that is

quantitively insignificant. Sakurai (2016) when estimating a HNKPC for Thailand finds a forward-looking behviour that is more dominant over the period 2009Q2 to 2014Q4. The author uses quarterly data namely GDP deflator as CPI is not readily available and the output gap to estimate the Phillips curve. It should be noted that the study captures two large crisis in Thailand in 1997 and 2008, however the NKPC is more observable and significant in post 2009 following improved economic conditions.

Moreover, Hervino (2015) finds that inflation dynamics in Indonesia can be explained by both the backward-looking and forward-looking components of the HNKPC. In this study, the forward-looking component is more significant by utilising monthly inflation expectations survey data from consumers despite the output gap being insignificant in the model. Similarly, in the case of Singapore, although both forward-looking and backward-looking expectations were important dynamics in Singapore's inflationary process, forward-looking expectations was more dominant (Meng, 2016).

Conversely, empirical studies have found the backward-looking component as a more significant factor in explaining inflation dynamics. A study by Tomfort (2011) considers the impact of inflation expectations on the development of inflationary process in the US and Germany. The results show that past inflation rates and forward-looking expectations were relevant explanatory variables in explaining the development of inflation expectations over the term of three years. However for longer time horizon, past inflation rates were more important than forward-looking expectations primarily relating to increasing uncertainty driving economic agents to anchor inflation expectations on past experiences hence favouring the lagged term of the model to become more dominant. Similarly, Mukhtar & Yousaf (2014) found empirical evidence in support of the backward-looking component as more significant in explaining inflation dynamics in Pakistan besides a significant output gap in the HNKPC model.

4. Data and methods

4.1 HNKPC model

We follow closely the HNKPC model proposed by Tomfort (2011) and Meng (2016) to model inflation expectations. The HNKPC model is specified as follows:

$$\pi_t = \gamma_{b\pi_{t-1}} + \gamma_{f\pi_{t+1}} + \mu \mathrm{Flx}_t + \lambda\, \mathrm{REERx}_t + \delta \mathrm{M0}_t + \beta \mathrm{O}_t + \eta \mathrm{Dum}_t + \varepsilon_t \qquad (1)$$

In equation (1), $\eta > 0, 0 < \gamma_b < 1, 0 < \gamma_f < 1$, $\gamma_b + \gamma_f = 1$. The HNKPC model (1) states that inflation at time t (π_t) depends on past inflation $(\gamma_{\pi_{t-1}})$, expected inflation $(\phi \mathrm{E}_{\pi+1})$; fuel prices proxied by tapis oil prices $(\mu \mathrm{Flx}_t)$; the real effective exchange rate, $(\lambda\, \mathrm{REERx}_t)$; money supply $(\delta \mathrm{M0}_t)$ as measured by reserve money; the output gap of the economy $(\beta \mathrm{O}_t)$; and a dummy variable $(\eta \mathrm{Dum}_t)$, which represented three major shocks in the economy affecting inflation in the 2008Q2 episode of global financial crises, 2010Q1 and 2014Q2 reflecting the supply shocks due to bad weather conditions.

The HNKPC model (1) is adopted for this study with modifications used to capture imported inflation through the real effective exchange rate. As marginal cost is not available for Solomon Islands, the output gap is used. The output gap mesasures the deviation of actual output from potential output. The process of generating the potential output was done through the Hodrick-Prescott filter method, then the output gap is defined as the diference between the actual and potential output in percent of potential output. When the output gap is zero, there is neither nor upward or downward pressure on inflation. When output gap is positive, there is an upward pressure on inflation while the opposite is true when there is a negative output gap. In theory, we expected to see a positive relationship between the fuel and inflation as fuel is an imported item in the Solomon Islands and adds to the cost of production in productive sectors. Likewise, reserve money is expected to have a positive correlation with the dependent variable as more money in circulation leads to inflation. As for real effective exchange rate, the expected coefficient is a significant positive relation.

4.2 Methodology

The HNKPC model is first estimated using the standard OLS method. The standard OLS estimates could suffer from the problem of serial correlation and endogeneity. As such the two common estimation methods also used in this study are the General Method of Moments (GMM) and the Fully Modified Ordinary Least Squares (FMOLS).

The GMM has been a popular methodology in the estimation of NKPC model. It was initially used by Gali & Gertler (1999) and subsequently by several other studies (Gali & Monacelli, 2005; Gali, Gertler, & Lopez-Salido, 2005). The GMM is a more preferred estimation method compared to its alternative as it is relatively simple to use based on its computation simplicity whereby specifiying the full data generating process for the forcing variable is not required and second for its robustness to correcting mispecifications (Mavroeidis, Plagbord-Moller, Mikkel, & Stock 2014). Notwithstanding these, Binyamini (2007) points out the drawback of this estimation method is the choice of instrument variables and the poor sampling properities of the GMM method. Similarly, Linde (2005) who utilises the Full Information Maximum Likelihood also rejects Gali & Gertler's (1999) estimation approach using the GMM and its findings in favour of a forward-looking NKPC. In reponse to these claims, Gali, Gertler, & Lopez-Salido (2005) finds that the conclusions of Gali & Gertler (1999) and others regarding the importance of forward-looking behaviour remain robust under various estimation procedures.

Moreover, the GMM estimation is conditioned on a set of instrumental variables, which requires the orthogonality conditions to be met. In order to determine the GMM estimates, the moment conditions are set in orthogonality conditions between the residual of the regression in equation (ε_t) and a set of instrumental variables ($\mathbf{z_t}$). The instrumental variable are variables that are influential to inflation. In Equation 1, the instrumental variables ($\mathbf{z_t}$) used in this model are three lags of each of the following variables: inflation, fuel prices, international food prices, real effective exchange rates and reserve money. The constant is also included as an instrument to restrict the model errors in the equation to have a zero mean.

The FMOLS estimator of Phillips & Hansen (1990) starts with the standard OLS regression. Subsequently, similar to the Phillips-Perron (Phillips & Perron, 1988) unit root test, the FMOLS makes a non-parametric correction to account for the endogeneity-bias and serial-correlation that may show up in the OLS residuals (Singh, 2016, 2017). The estimates of the long-run parameters and the associated t-statistics are, thus, adjusted to correct for the bias arising from the endogeneity of regressors and serial-correlation of residuals.

4.3 Data

Estimation of the HNKPC model is based on quarterly data spanning from 2003Q1 to 2017Q4. Data coverage were dictated by non-availability of some variables in prior periods such as the monetary data. Variables used in the study are headline inflation rate (Inf) which measures the price movement under the three-months moving average (3mma) measure; real effective exchange rate (REER); fuel prices using the the tapis oil prices (Fl), reserve money supply (M0); output gap (OG) and a dummy variable for 2008Q2, 2010Q1 and 2014Q2 reflecting several spikes in inflation rates (Dum). The output gap is calculated using the Hodrick-Prescott (HP) filter techniques and the use of chow-lin disaggregation procedure. In determining the output gap, quarterly GDP was generated using the imported food index reflecting several imported food items such as wheat, flour, sugar, beef and chicken prices.

All data are available in quarterly frequency except for GDP which is compiled on an annual basis and is disaggregated using methodologies of Chow and Lin (1971) and Fernandez (1981) to convert the annual GDP series to a quarterly real GDP series. Although GDP is not included in the model, it is used in computing the output gap. Both GDP and headline inflation are sourced from SINSO, whilst real effective exchange rate, food price index and fuel prices are sourced from the International Financial Statistics and IMF websites respectively.

5. Empirical results

5.1. Unit root tests

The aim of this section is to assess the time series properties of inflation and its explanatory variables. In determining the order of intergration, the augmented Dickey Fuller (Dickey and Fuller, 1979, 1981) and Phillips-Perron (Philips & Perron, 1988) test for the null hypothesis of a unit root were conducted. The Augmented Dicky Fuller (ADF) test is based on the following regression model:

$$\Delta y_t = \kappa + \alpha y_{t-1} + \beta_t + \sum_{j=1}^{m} \mathrm{dj}\Delta\mathrm{yt} - \mathrm{j} + \varepsilon_t \qquad (2)$$

Equation (2) tests for a unit root in y_t, where y consists of each of the four variables in our model, $t = 1 \ldots T$ is an index of time, Δy_{t-j} is the lagged first differences to accommodate serial correlation in the errors, ε_t. In conducting the unit root test, all variables were checked with only intercept. The null and the alternative hypotheses for a unit root in yt are: H_0: $\alpha = 0$ and H_1: $\alpha<0$. To select the lag length (k), we use the'*t-sig'* approach proposed by Hall (1994).

Both the ADF and Phillips-Perron tests showed that dependent variable and output gap are stationary variable or I(0), while the rest of the explanatory variables are non-stationary variables or are integrated of order one I(1) (see Table 3). The results indicated that all variables except for inflation rate and output gap are I(1) (non-stationary). Inflation rate and output gap are stationary at the levels, implying a much smoother path in comparision to month-on-month price movement as the headline inflation is obviously used in monetary policy considerations. The rest of the variables are therefore converted to first differenced form to induce stationarity, implying non-stationary data or I(1) variables.

Table 3: Unit root test results

	ADF Statistics		Phillips-Perron Statistics	
Series	Level	Difference	Level	Difference
Inf	-3.2890**		-2.6968*	
FI	-1.9738	-6.2101***	-2.0886	-6.0726***
M0	0.4970	-8.5608***	0.6415	-8.5344***
REER	-0.7122	-6.1795***	-0.6330	-5.7842***
OG	-4.0429***		-4.1148***	

Notes: ***,**, * indicate the statistical significance at the 1%, 5% and 10% respectively. The MacKinnon (1996) critical values for ADF are -2.5940 (at 10%), -2.9126 (at 5%), and -3.5482 (at 1%). The critical values for Phillips-Perron test are 2.5936 (at 10%), 2.9117 (at 5%) and -3.546 (at 1%) (Mackinnon, 1996).

5.2. HNKPC model estimates

The HNKPC model is estimated using the standard OLS, GMM and FMOLS methods. The results of the HNKPC estimation are two-fold. Apart from establishing whether a short-run trade-off between inflation and output exists, this study also establishes the combined

influence of backward and forward-looking behaviour to influencing inflation as depicted by the model results (see Table 4). The model specification showed that both the backward and forward-looking components appeared to have statistically significant coefficients. The backward-looking component is estimated at 0.66, indicating a high level of inflation persistence. Similarly, the significance of the forward-looking coefficient implies that the inflation process in the Solomon Islands is also influenced by forward-looking expectations.

Table 4: Standard OLS and the efficient GMM and FMOLS estimates of the model

[Dependent variable: Headline inflation rate]			
Independent variable	Standard OLS estimates	GMM estimates	FMOLS estimates
C	-0.0225	-0.1799	-0.5243
	(0.9586)	(0.7738)	(0.3992)
Inf (-1)	0.6023***	0.6577***	0.5995***
	(0.0000)	(0.0000)	(0.0000)
Inf (1)	0.3981***	0.3339***	0.4288***
	(0.0000)	(0.0010)	(0.0000)
FI	0.0000	0.0610*	-0.0021
	(0.9987)	(0.0601)	(0.8787)
M0	-0.0030	-0.0010	-0.0034**
	(0.3036)	(0.8770)	(0.0242)
REER	0.0623	0.1972**	0.0485
	(0.4732)	(0.0344)	(0.3364)
OG	39.8279***	59.3161***	30.9860***
	(0.0093)	(0.0002)	(0.0014)
Dum	1.2094	-1.0053	1.3080
	(0.3093)	(0.4913)	(0.0813)
R^2	0.8987	0.8676	0.8977
F-statistics	63.3481***		
J-statistics		8.9474	
DW	2.8748	2.2034	
Obs	58	55	57

Notes: Figures in parentheses are the p-values. ***, ** and * indicate the statistical significance of the coefficient at the 1%, 5% and 10% level, respectively. The J statistics for the GMM estimates is 0.4421.

The past and expected inflation are highly significant across all the OLS, GMM and FMOLS estimates of the model, implying a high level of inflation persistence in the inflation process and the importance of inflation expectations (see Table 4). Similarly, the output gap representing marginal cost in Solomon Islands is highly significant with positive coefficient implying the importance of aggregate demand in inflation process and a positive relationship between output gap and inflation. The output gap is also significant implying inflation is susceptible to aggregate demand in the economy. Fuel prices also have a positive relationship with inflation at 10% confidence level and positively related to inflation under the GMM model although not significant under the OLS model. In contrast, fuel prices has a negative relationship with inflation under the FMOLS model although it is insignificant. Solomon Islands is highly dependent on imported fuel therefore fuel is one important indicator of inflation movements. On the other hand, reserve money is negatively related to inflation and insignificant in all models. This in part is explained by the weak transmission mechanism in the money aggregates to affecting inflation as other channels may have played a dominant role. As for real effective exchange rate, it is significant and positively related under GMM model, however, it is insignificant under the OLS and FMOLS models despite showing a positive relationship. The positive relationship between real effective exchange rate and inflation seen in the GMM model implies a direct effect of exchange rate on inflation. On the other hand, the dummy variable representing global financial crisis and supply shocks were found to be insignificant although showing the right negative relationship with inflation under the GMM model.

6. Conclusion and policy implications

Modelling the Hybrid New Keynesian Phillips Curve (HNKPC) is important as it contains information about adaptive and rational expectations which are crucial for policy analysis. Expected inflation and past inflation plays a significant role in determining the current inflation and therefore it is important for the Central Bank to incorporate past and future inflation expectations in the estimation of a forecasting model for inflation in the Solomon Islands. The study has estimated the model for the HNKPC using quarterly time series data for the period 2003-2017 for Solomon Islands, by applying the standard OLS and the efficient GMM and FMOLS estimation methods. The results confirm that the HNKPC does exist for Solomon Islands and relevant for modelling inflation dynamics in Solomon Islands. There is evidence of inflation persistence in the inflation process as demonstrated by a more significant backward-looking coefficient. The forward-looking coefficient is also statistically significant indicating that inflation expectations are an important component of the inflationary process in Solomon Islands. Therefore, inflation expectations do matter for such a small open economy, implying that future perceptions are crucial for inflation process in the Solomon Islands together with past inflation.

The findings of this study provide basis for monetary policy framework in the Solomon Islands. The result also confirms the significance of fuel prices, the real effective exchange rates and the output gap in the process of inflation as opposed to monetary variables, promulgating the need to manage the trade-weighted exchange rate basket. The result also triggers the need to research further on the weak transmission mechanism to disentangle how best the Central Bank can perform its monetary policy under the current regime and decide on how it can effectively conduct its monetary policy in achieving its mandatory role of price stability.

Notes and references

Abbas, K S, Bhattacharya, P S, Mallick, D, and Sgro, P, 2016, 'The New Keynesian Philips curve in a small open economy: Empirical evidence from Australia', *Economic Record,* 92(298), pp. 409–34.

Binyamini, A, 2007, 'Small open economy New Keynesian Philips curve: Derivation and application to Israel', *Israel Economic Review,* 5(1), pp. 67–92.

Calvo, G A, 1983, 'Staggered prices in a utility maximising framework', *Journal of Monetary Economics*, 12(3), pp. 383–98.

Central Bank of Solomon Islands, 1988, *Seminar on Inflation: Causes, effects, remedies.* Honiara: Central Bank of Solomon Islands.

Central Bank of Solomon Islands, 2007, *Annual Report 2007.* Honiara: Central Bank of Solomon Islands.

Chow, G C, and Lin, A-l, 1971, 'Best linear unbiased interpolation, distribution and extrapolation of time series by related series', *The Review of Economics and Statistics,* 53(4), pp. 372–5.

Cunningham, R, Desroches, B and Santor, E, 2010, 'Inflation expectations and conduct of monetary policy: A review of recent evidence and experience', *Bank of Canada Review*, pp. 13–25.

Dickey, D A, and Fuller, W A, 1979, 'Distribution of the estimators for autogregressive time series with a unit root', *Journal of the Americal Statistical Association*, 74(366), pp. 427–31.

Dickey, D A, and Fuller, W A, 1981, 'Likelihood ratio statistics for autoregressive time series with a unit root', *Econometrica,* 49(4), pp. 1057–72.

Domic, A, 2012, 'An application of New Keynesian models to inflation in Croatia', *Business Systems Research,* 3(2), 6–13.

Dorich, J, 2009, Forward-looking versus backward-looking behaviour in inflation dynamics: a new test. 2010 Meeting Papers from Society for Economic Dynamics. Ottawa: Bank of Canada.

Dufour, J-M, Khalaf, L and Kichian, M, 2005, 'Inflation dynamics and the New Keynesian Philips curve: An identification-robust econometric analysis', *Bank of Canada Staff Working Paper No. 2005,* p. 27.

Eviews, 2015,*Eviews 9 Users Guide II.* Carlifornia: IHS Global Inc.

Fernandez, R, 1981, 'A methodological note on the estimation of time series', *The Review of Economics and Statistics,* 63(3), pp. 471–6.

Fuhrer, J, 2009, *Inflation persistence.* Boston: Federal Reserve Bank of Boston.

Fuhrer, J and Olivei, G P, 2010, 'The role of expectations and output in the inflation process: An empirical assessment', *Public Policy Briefs No.10–2.* Boston: Federal Reserve Bank of Boston.

Gali, J and Gertler, M, 1999, 'Inflation dynamics: A structural econometric analysis', *Journal of Monetary Economics*, 44(2), pp. 195–222.

Gali, J and Gertler, M, 2000, 'Inflation dynamics: A structural econometric analysis', *NBER Working Paper* WP. 7551, pp. 1–25.

Gali, J and Monacelli, T, 2005, 'Monetary policy and exchange rate volatility in a small open economy', *Review of Economic Studies,* 72, pp. 707–34.

Gali, J, Gertler, M and Lopez-Salido, J D, 2005, *Robustness of the estimtates of the hybrid New Keynesian Philips Curve*, Cambridge: National Bureau of Economic Research Working Paper No.11788.

Hall, A, 1994, 'Testing for a unit root in time series with pretest data based model', *Journal of Business and Economic Statistics,* 12(4), pp. 461–70.

Hervino, A D, 2015, 'A hybrid model of New Keynesian Philips curve: An application in Indonesia', *Journal of Economics, Business, and Accountancy Ventura,* 18(3), pp. 311–6.

Ishak-Kasim, S and Ahmed, A D, 2010, Inflation expectations and rationality: Evidence from Indonesian survey data. *Economics and Finance in Indonesia,* 57(3), pp. 255–75.

Leith, C and Malley, J, 2003, 'Estimated open economy New Keynesian Philips curve for the G7', *University of Glasgow No. 834.* Glasgow: University of Glasgow.

Leshoro, T and Kollamparambil, U, 2016, 'Inflation or output targeting? Monetary policy appropriateness in South Africa', *PSL Quarterly Review, 6*9(276), pp. 77–104.

Linde, J, 2005, 'Estimating New-Keynesian Phillips: A full information maximum likelihood approach', *Journal of Monetary Economics,* 52(6), pp. 1135–49.

Maturu, B, Kisinguh, K and Maana, I, 2006 *A New Keynesian Philips curve for Kenya*. Nairobi: Central Bank of Kenya.

Mavroeidis, S, Moller-Plagborg, M and Stock, J H, 2014, 'Empirical evidence on inflation expectations in the New Keynesian Philips curve', *Journal of Economic Literature,* 52(1), pp. 124–88. Retrieved from http://dx.doi.org/10.1257/jel.52.1.124

Meng, C K, 2016, 'The inflation process and expectations in Singapore', In Bank of International Settlements (ed), *Inflation mechanisms, expectations, and monetary policy*, Bank of International Settlements, pp. 335-43.

Mihailov, A, Rumler, F and Scharler, J, 2011, 'The small open-economy New Keynesian Philips curve: Empirical evidence and implied inflation dynamics', *Springer,* 22(2), pp. 317–37.

Mukhtar, T and Yousaf, A, 2014, 'Inflation dynamics and New Keynesian Philips curve: A reassessment for Pakistan', *Journal of Business & Economics,* 6(2), pp. 177–202.

Philips, A W, 1958, 'The relation between unemployment and the rate of change money wage rates in the United Kingdom, 1861-1957', *Economica*, 25(100), pp. 283–99.

Philips, P C and Perron, P, 1988, 'Testing for a unit root in time series regression', *Biometrika,* 75(2), pp. 335–46.

Philips, P and Hansen, B, 1990, Statistical inference in instrumental variables regression with I(1) processes. *Review of Economic Studies*, 57(1), pp. 99–125.

Rudd, J and Whelan, K, 2001, *New tests of the New-Keynesian Philips curve,* Washington: Federal Reserve Board.

Sakurai, H, 2016, 'The New Keynesian Philips curve in Thailand through two financial crisis', *Asia Economic and Financial Review,* 6(4), pp. 90–195.

Sediakgotla, L K, 2017, 'The short-run dynamics of inflation: Estimating the Hybrid New Philips curve for Bostwana', *Research Bulletin,* 30, pp. 15–22.

Singh, T, 2017, 'Sustainability of current account deficits in the OECD countries: Evidence from panel data estimators', *Global Economy Journal*, 17(4), pp. 1–16.

Singh, T, 2016, 'International mobility of capital in the United States: Robust evidence from time-series tests', *Journal of Time Series Econometrics,* 8(2), pp. 193–249.

Solomon Islands National Statistics Office (SINSO), 2018, *Honiara Consumer Price Index: Statistical Bulletin June 2018*. Honiara: SINSO.

Takana, V, Samani, P and Especkerman-True, K, 2015, 'Determinants of inflation in the Solomon Islands', *Central Bank of Solomon Islands Working Paper No.2015/01*.

Tomfort, A, 2011, 'The role of inflation expectations', *International Journal on GSTF Business Review,* 1(1), pp. 221–6.

United Nations Development Programme, 2018, *Human development indices and indicators: 2018 statistical update*. Washington DC: Communications Development Incorporated.

Notes

1 The World Bank, World Development Indicators (2019).

2 The HRPI used 1977 as the base year i.e. 4th quarter 1977=100.

3 The HCPI Series 3 uses 2013=100 as base year and 2017=100 as an index reference period.

4 The HCPI Series 2 is used in this study due to availability of longer time series data compared to the latest HCPI Series 3.

5 The Calvo (1983) model assumes that in a hypothetical economy comprising of a monopolistically competitive market, firms are perfectly identical albeit having differential product and pricing history. Based on the differences in pricing mechanism assumption, a fraction of the firms $(1-\vartheta)$ are assumed to change their prices while the remaining firms (ϑ) maintain their prices unchanged.

GRIFFITH ASIA INSTITUTE

Griffith University Nathan campus
Nathan Queensland 4111, Australia

Phone: +61 7 3735 3730
Email: gai@griffith.edu.au

griffith.edu.au/asiainstitute

CRICOS No. 00233E