Monetary policy and exchange rate regime in tourist islands

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Abstract

The broad impact of the travel industry on economies has been comprehensively analysed in the tourism literature. Despite this, its consequences for monetary policy have remained unaddressed. This paper aims at providing a first approach in this line for the case of three small tourist island such as Cabo Verde, Mauritius and Seychelles. The research is based on a Bayesian estimation using a Stochastic dynamic general equilibrium model (SDGE), and where the optimal response to a tourism demand shock of four monetary policies are analysed. According to the results, both a conventional peg and an *inflation-targeting* policies achieve better economic performance. More precisely, the inflation is lower in the former. However, the rise in consumption and the gain in the external competitiveness is sharper in the latter. Finally, the other two policies, an *inflation-targeting* with managed exchange rate policy and an *imported-inflation targeting* policies generates higher consumption and external competitiveness, but, also higher inflation and interest rate.

Keywords: Stochastic dynamic general equilibrium models; monetary policy; tourism demand; and exchange rate.

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Introduction

The economic context

Similar to other small islands, the economic development of Cabo Verde, Mauritius and Seychelles has predominantly been constrained by a lack of resources, its distance from international markets and/or low domestic demand. On the other hand, their economies have historically been defined by a poorly diversified productive structure, which mainly relies on low productive sectors such as agriculture and fishing. In the same line, these nations have been heavily dependent on imports, which is also the main cause of its chronic current account deficit. In 2019, imports account for around 55% of GDP in Mauritius, 61% in Cape Verde and 113% in Seychelles. All these factors help explain its difficulties in establishing stable economic growth throughout its history (Pratt, 2015).

The three of them are located in Africa and, as former European colonies, they still have strong economic ties with Europe. According to the Observatory of Economic Complexity (OEC), in 2018, more than 80% of exports of goods in Cape Verde, and almost 50% and 40% in Seychelles and Mauritius, respectively, were demanded from European countries. Despite these figures, the economic importance of these exports is marginal in Cabo Verde (5.6% of the GDP) and Mauritius (2% of GDP), while in Seychelles, this share reaches around 23.75% during the period 1980-2017. By contrast, services have experienced a sharp upward tendency over the same time frame. In this sense, the exports of services represent a share of GDP of around 20.5% for Cape Verde and Mauritius, and 52.08% for Seychelles.

Tourism

Historically, remittances and international aid represented the primary foreign income of the Cabo Verdean economy (Bourdet and Falck, 2006; and Resende-Santos, 2016). For instance, in the late 1990s, remittances generated three times more currencies than goods exports and two and a half times more than tourism receipts. However, tourism became a significant economic factor that displaced remittances as a source of foreign income in the early 2000s. Currently, income from tourism represents more than 50% of total exports (around 75% of total service exports in 2018); and continues to grow. Both, the increasing importance of tourism and the steady fall in remittances, should be perceived as a positive symptom of the archipelago's economic and welfare development.

Seychelles and Mauritius started their transformation into a tourism-led economy in the 1970s (Archer and Fletcher, 1996; Durbarry, 2004) and the relevance of remittances has been significantly lower than in the case of Cape Verde for at least the last 30 years. In the case of Mauritius, Durbarry (2002) highlight the public effort to positioning the country as a leading tourism destination in the high-end segment. Overall, tourism receipts had averaged, as % of GDP, around 36.2% in Seychelles, 16.2% in Mauritius and 35% in Cabo Verde for the period 1995-2018 (see, Figure 1).

[Figure 1 about here]

The importance of tourism in these three nations and their economic contexts cannot be unconnected to their monetary policy or their exchange rate regime. In economic terms, tourism relies heavily on non-tradable sectors; thus, the pressure on the real exchange rate does not diminish. Besides, the higher income level of international tourists represents an increasing source of pressure on local prices. The import dependence also represents a significant growth limitation (*leakage effects*) in tourism-based economies (Dwyer, Forsyth & Dwyer, 2010), whereas, it also has a profound influence in the conduction of monetary policy when aimed at controlling imported inflation. As noted by Larose (2003), the latter has been especially recurrent in Mauritius and Seychelles. Nevertheless, the share of imports may vary with the Tourism Life Cycle (TLC), showing high values at the first stage of tourism development (exploration and development), but falling at the end (Pratt, 2011).

On the other hand, tourism faces volatile demand, which becomes more apparent at emerging destinations, and where seasonality represents an additional factor of concern when dealing with tourism demand. In last term, this volatility may affect the value of the local currency. These sudden changes in value may affect inflation and the competitiveness of exports, causing, like in the case of Mauritius and Seychelles, timely interventions in this market, or adopting a fixed exchange rate to protect its value like in Cabo Verde.

In sum, this paper provides a novel approach to the discipline by analysing the economic impact of tourism in the conduction of monetary policy in these three economies. The study sheds light on the consequences of adopting four alternative monetary policies when addressing 'tourism demand shock': a conventional peg, an *inflation-targeting*, an *inflation-targeting* with managed exchange rate, and an *imported-inflation-targeting* policies. The research is based on a Bayesian estimation using a Stochastic dynamic general equilibrium model (SDGE) adapted from Justiano and Preston (2010). The dataset comprises quarterly economic data during the period 2007Q1-2019Q2.

Literature review

The economic impact of tourism

The overall impact of tourism on the economy has been widely addressed in the literature, and can be summarised as follows. Overall, tourism has been a significant cause of economic growth in many economies, especially on tourism islands (Brau, Lanza, & Pigliaru, 2007; Lanza, Temple and Urga, 2003; or Lee and Chang, 2008) and a source of poverty alleviation (Blake, Arbache, Sinclair and Teles, 2008; and Njoya and Seetaram, 2018). The small size, the lack of resources, the strong dependence on imports and/or the distance to major markets manifest the structural limitations of these kinds of economies to achieve significant economies of scales and compete internationally in many industrial activities. Historically, this represented one of the main causes of their economic underdevelopment. However, a key aspect of tourism is that it is perceived as a luxury good, which has been confirmed by several authors such as Untong, Ramos, Kaosa-Ard and Rey-Maquieira (2015), Smeral (2004), Algieri and Kanellopoulou (2009) and Falk (2014). This tourism demand behaviour leaves room for higher value-added gains allowing competition in this sector (Inchausti-Sintes, 2019a and 2019b).

On the other hand, the impact of tourism cannot be restricted to certain key sectors, because it affects the rest of the economy (Adams and Parmenter, 1995; Inchausti-Sintes, 2015; Narayan, 2004; Capó, Riera & Roselló, 2007). For instance, it triggers real exchange appreciation that detracts from traditional exports and increases imports. Moreover, the potential effects of tourism with other sectors, such as agriculture and fishing, light industry or construction to enhance economic diversification (Njoya and Nikitas, 2019; Pratt, 2011; Cai, Leung and Mak, 2006; Blake, 2008; Kweka, Morrissey and Blake, 2003; Valle and Yobesia, 2009) is somewhat blurred by evidence showing the marginal weight of these sectors in total GDP at most tourism destinations (Inchausti-Sintes, 2019a). In this regard, the manufacturing sector accounts for 6%, 11% and 6.2% of total GDP in Cabo Verde, Mauritius and Seychelles, respectively. while it reached its peak during the 1990s when it averaged 12% in Cape Verde and Seychelles, and 20% in Mauritius. The latter is not necessary or always caused by tourism, but, in most of the cases, is an inherited structural flaw in these economies prior to tourism development.

Moreover, given the prevalence of imports in these kinds of economies, this rise simply increases the *leakage* effect - limiting the positive effect of tourism - although it tends to reduce with tourism development (Pratt, 2011). Finally, tourism also causes a sectoral shift from the tradable sector to the non-tradable sector, which exacerbates inflation, depletes sectoral diversification, and jeopardizes productivity gains. Fortunately, the appeal of tourism as a luxury good also allows compensating productivity gains with quality

Monetary policy and home bias

All these impacts in the real economy also affect the conduction of monetary policy in these kinds of economies, which consequently have to ‘understand’ and react to this impact. In this sense, the degree of openness (*home bias*), especially on small islands, is a key factor to address. As noted by Faia and Monacelli (2008), inflation volatility is U-shaped in the degree of trade openness (imports to GDP). Assuming extreme values of the latter (0 no-trade openness, or 1, no home bias) in a small-economy setting mimics a closed economy situation by generating lower inflation volatility in both cases. The authors also detect that the volatility of the real exchange rate decreases in the degree of openness. For instance, a greater degree of openness means a smoother nominal exchange rate would be prescribed, which leads to a smoother adjustment in both the real exchange rate and the terms of trade. Whereas, when it approaches purchasing power parity (low degree of openness), it requires a stronger adjustment in the last two variables to restore macroeconomic equilibrium.

Regardless of the structural conditions, the importance of imports in these kinds of economies is also ruled by domestic demand. Domestic preferences tend towards domestic goods (*home bias*), even with low trade costs (Obstfeld and Rogoff, 2000), whereas it reduces with economic integration (Mika, 2017) or inmigration (White, 2007). Furthermore, this helps explain the volatility of the nominal exchange rate and long-run deviations from PPP (purchasing power parity) (Warnock, 2003). Specifically, this latter author affirms that the nominal exchange rate depreciates more with an increase in the money supply when domestic goods prevail over imported goods (*home bias*) reducing the *pass-through* effect in domestic prices. According to the author, the facilitates a beggar-thy-neighbour monetary policy. Wang (2010) also argues that, with lower *home bias*, it is preferable to stabilise the real exchange rate under an uncovered interest rate parity (UIP) shock. According to him, in these circumstances, the real exchange rate allows output fluctuations to be reduced. This lower volatility in macroeconomic variables is higher under monetary union (an extreme case of a peg), while eliminating UIP shocks (Kollmann, 2004). Besides, this positive effect increases with lower *home bias*.

Monetary policy on small islands

The small size of the economy, the undiversified economic structure or high dependence on imports, among others, are not the only factors that influence economic growth or monetary policy on small islands. The proper management of the latter also presupposes an adequate financial system and credit demand. As noted by Jayaraman and Choong (2010), Jayaraman and Dahalan (2008) and Ramlogan (2004), the former usually show an insufficient degree of development, while the latter tend to be weak in these kinds of economies. This entails, for instance, that rather than the interest rate, both the money and the exchange rate emerge as the main channel of monetary policy to affect the real economy (Jayaraman and Dahalan, 2008; and Ramlogan, 2004). Unsurprisingly, many small islands have historically opted for fixed or managed exchange rate regimes (Yang, Davies, Wang, Dunn and Wu, 2012; Jayaraman and Choong, 2010 and International Monetary Fund, 2019). Rodriguez-Fuentes (2017) goes a step further and argues that, given the aforementioned circumstances, Caribbean islands are 'incapable' of conducting their own monetary policy. Similarly, De Brouwer (2000) suggests, for the case of some small Pacific Islands, that they should adopt a fixed exchange rate with the Australian dollar.

The use of a foreign currency of a nominal anchor reduces economic volatility, the *pass-through* effect, and, overall, has proved its usefulness in controlling inflation. In some cases, inflation remains lower than other *free-floating* small islands (Boyd and Smith, 2006). Nevertheless, it entails the loss of control over monetary policy as an economic instrument. Under this regime, changes in the domestic interest rate depend on respective changes in the third country, which, at the same time, will raise or reduce its rate according to their economic circumstances. In general, decoupling in their respective economic performances may eventually trigger counter-productive policies; leading to exchange rate speculation in the pegged economy. In the worst scenario, it would imply entirely abandoning this regime (Cavallo and Cavallo, 2017). In a more "business as usual" scenario, Weber (2005) notes, for the case of Cabo Verde, that this regime leads to persistent high-interest rates that detract from domestic investment and economic growth. On the other hand, the lower capital inflows attracted by these kinds of economies allow them to enjoy a certain degree of freedom under a fixed exchange regime (Yang, et al., 2012).

The monetary policy in Cabo Verde, Mauritius and Seychelles

Shortly after gaining its independence, Cabo Verde managed its monetary policy by establishing a fixed interest rate; and where the Central Bank operated as both a central and commercial bank, simultaneously. In term of the currency, the country adopted a fixed exchange rate, but against a basket of currencies. The 1990s was a period of profound economic reform aimed at revitalising the economy and the public administration. The Central Bank also underwent profound changes in its management and responsibilities more aligned with its counterparts in developed countries. Monetary policy benefited from these changes and became more effective in controlling inflation (Oliveira, Frascaroli and da Silva, 2015). The last significant reform took place in 1998 when the country signed the Exchange Rate Cooperation Agreement with Portugal; which aimed at establishing full convertibility of the national currency and a fixed exchange rate, which came to operate as a nominal anchor that ensured price stability. In 1999 the euro replaced the Portuguese escudo as the nominal anchor in the country. As noted by Weber (2005), the appreciation of the euro has brought increasing pressure to bear on this regime, which has involved recurrent interest rate increases and led to falling domestic investment and economic growth. Conversely, the inflation rate has been steadily decreasing and, since the summer of 2003, has remained below 2% (the annual goal established by the European Central Bank for its country members).

In the case of Mauritius, the 1980s and 1990s was also a period of profound economic changes after years of economic instability (Larose, 2003). For instance, the control of prices has always been a key objective of the Bank of Mauritius (BoM). Nevertheless, previous to these decades, inflation averaged 17% during the period 1975-1982, while it reached 7.4% until the 1990s (Heerah-Pampusa, Khodabocus, Morarjee & Bissessur, 2006). During the 1990s, the erratic conduction of the monetary policy was progressively controlled by limiting the expansion of credit, establishing an annual ceiling in the interest rate (Fry and Roi, 1995). Even when the BoM was capable of reducing the volatility of prices, the inflation still averaged 6.8% for the period 1992-1999. In 1999, the BoM changed their monetary framework, focusing on interest rates to control the monetary growth averaging an inflation rate of 5.1 for the period 200-2005. In 2004, the BoM act (Gazzete of the Republic of Mauritius, 2004) was changed and now clearly defines that the primary objective is to keep the price stability and promoting an orderly and balanced economic development (Tsangarides, 2010). In 2006 the Central Bank introduced its current framework, the KRR, where the overnight interbank interest rate is the operational target. According to the Annual Report on Exchange Arrangements and Exchange Restrictions of International Monetary Fund (AEAER, 2018), nowadays the Mauritius rupee is free-floating currency. However, the BoM apply some timely interventions in the market.

During most of its history, the Central Bank of Seychelles (CBS) had a monetary policy based on a fixed exchange rate linked to a weighted basket of currencies. The main regulations of the banks were established in 1982 but it has been amended several times since them (1986, 1999, 2001, 2004 and 2008). In 2008, the bank underwent a profound reform changing, drastically, the monetary framework of the institution. The new one replaced the exchange rate nominal anchor by a monetary policy focused on monetary aggregate (CBS, 2018). This change was part of a macroeconomic program of reforms promoted by the International Monetary Fund (IMF) (IMF, 2008). This policy aimed at liberalising the foreign exchange rate market and improving price stability. More recently, in 2019, the CBS changed again its monetary policy framework from monetary aggregate targeting to an interest rate-based economy.

Methodology

The model is a small-open economy proposed by Justiano and Preston (2010), and was programmed in Dynare 4.5.3. Firstly, we briefly introduce the main theoretical issues and assumptions of the model. Those interested in the mathematical formulation are referred to Justiano and Preston (2010). Finally, we transcript the log-linearised equations of the model used in the estimation.

Main theoretical issues and assumptions

The model allows for incomplete asset markets, habit formation and price indexation to past inflation. The premise of incomplete asset markets allows risk-premium discrepancies to be taken into account. This risk-premium contributes to explaining the persistent interest rate gap in the three economies. Moreover, as demonstrated by Justiano and Preston (2010), restricting the relative movements of the domestic and foreign interest rate, causes the law of one price (*LOP*) to fail ($\widetilde{\Psi}_t \equiv \frac{\tilde{e}_t P_t^*}{P_t} \neq 1$, where the *LOP* gap ($\widetilde{\Psi}_t$) depends on the nominal exchange rate $\tilde{e}_t$ and on the international and domestic prices ($P_t^* \; and \; P_t$, respectively)).

In terms of habit formation, the above implies assuming a certain kind of *consumption inertia* (i.e. the representative household not only derives utility from current consumption, but is also affected by past consumption patterns, which they try to maintain over time). In terms of economic adjustment, habit formation reduces the possibility of a sudden change in consumption pattern. In mathematical terms, it implies that the utility function is no longer additively separatable over time (Torres, 2003). Similarly, price indexation also seeks to capture the inflation inertia observed in the economy. The modelisation for this behaviour is based on 'Calvo price setting' (Calvo, 1983). This author introduces inflation indexation by assuming that, in any period, a fraction of firms set prices optimally, while another fraction of them update their prices only to past inflation. Specifically, the model assumes the existence of two kinds of firms: domestic producers (*H*) and imported firms (*F*) (retail firms). Each of them determine their prices according to the Calvo setting.

Tourism is introduced in the model in the market-clearing condition: $Y_{H,t} = C_{H,t} + C^*_{H,t}$, where H refers to the domestic economy in period t . $Y_{H,t}$ denotes the domestic production which is domestically ($C_{H,t}$), or internationally ($C^*_{H,t}$,) consumed. The latter is disentangled, at the same time, in tourism export and remaining exports according to a Cobb-Douglas demand: $\alpha_{tour} Ctour^*_{H,t}$; $\alpha_x X^*_{H,t}$, where $Ctour^*_{H,t}$ refers to tourism consumption, $X^*_{H,t}$ denotes the remaining exports and; α_{tour} and α_x refer to the share of tourism consumption and remaining exports in the domestic economy (% GDP), respectively. Theoretically, the foreign demand function of both goods/services are: $Ctour^*_{H,t} = \left(\frac{P^*_{H,t}}{P^*_{,t}}\right)^{-\lambda} Y^*_t$ and $X^*_{H,t} = \left(\frac{P^*_{H,t}}{P^*_t}\right)^{-\tau} Y^*_t$, where λ and τ denote their respective elasticity of demands. Finally, the monetary policy is introduced in the model with the Taylor rule.

Log-linearised model

This subsection briefly introduces the equations used in the estimation and simulation of the model. The advantage of using log-linearised models is that all variables are in log-deviation from the steady-state (lower cases); and thus, the initial values of all variables are set to zero, facilitating the fulfilment of Blanchard-Kahn conditions.

domestic households' Euler equation:

This equation arises from the optimal behaviour of the representative household and it is represented in equation (1).

$$c_t - hc_{t-1} = E_t(c_{t+1} - hc_t) - \sigma^{-1}(1-h)(i_t - E_t\pi_{t+1}) + \sigma^{-1}(1-h)(\varepsilon_{g,t} - E_t\varepsilon_{g,t+1}) \quad (1)$$

Where c_t denotes household consumption, h is the habit formation parameter, σ denotes the inverse elasticities of intertemporal substitution and labour. E_t denotes the expectation operator that apply over a one period ahead of inflation ($E_t\pi_{t+1}$) and over the $\varepsilon_{g,t}$ preference shock ($\varepsilon_{g,t}$) ($E_t\varepsilon_{g,t+1}$). The usual Euler equation for domestic household can be obtained if $h = 0$. Alongside exports, this optimal demand decision must be satisfied in the market by the production (domestic or imported). In sum, all these decisions are represented in the market-clearing condition (equation 2).

Market clearing condition:

$$(1-\alpha)c_t = y_t - \alpha\eta(2-\alpha)s_t - \alpha\eta\psi_{F,t} - \alpha(\alpha_x x^*_{H,t} + \alpha_{tour} ctour^*_{H,t}) \quad (2)$$

s_t refers to the terms of trade ($\Delta s_t = \pi_{F,t} - \pi_{H,t}$) and is related to the real exchange rate in the following manner:

$$q_t = e_t + p^*_t - p_t = \psi_{F,t} + (1-\alpha)s_t\ . \quad (3)$$

α denotes the share of import consumption in the total consumption basket, while η ($\eta > 0$) is the elasticity of substitution between domestic and foreign goods, (see section 2.1 in Justiano and Preston, 2010). y_t denotes domestic production and finally, the LOP gap is $\psi_{F,t} \equiv (e_t + p^*_t) - p_{F,t}$. While the nominal exchange rate simply represents the price of one currency in term of others, the real exchange rate allows comparing the prices of different countries ‘consumption baskets in term of one reference basket and currency. I.e. in this case, it allows measuring the degree of foreign competitiveness by comparing the prices of consumption baskets in Cabo Verde, Mauritius and Seychelles in respect to the European Union (reference country). The terms of trade (s_t) represents the difference in prices between exports and imports. I.e. how many units of exports are needed to purchase a unit of imports. Finally, $Ctour^{*}_{H,t}$ and $x^{*}_{H,t}$ were previously introduced and denote the tourism demand and remaining exports, respectively.

In the case of Mauritius and Seychelles, the nominal exchange rate is allowed to vary and adopt the following functional form: $e_t = e_{t-1} - (q_t - q_{t-1}) + \pi^{*}_t - \pi_t$ (4)

On the one hand, equation (2) implies that domestic consumption depends not only on domestic output, but also on three foreign sources: the terms of trade, the deviations from the law of one prices and foreign output. On the other hand, equation (3) implies that the real exchange rate varies with the differences in consumption bundles across domestic and foreign economies and the deviations from the law of one price.

The terms of trade and the real exchange rate are linked according to

Domestic firms' inflation:

Equation (5) represents firms optimality condition, which imply the following relationship for inflation:

$$\pi_{H,t} - \delta_H \pi_{H,t-1} = \theta_H^{-1}(1-\theta_H)(1-\theta_H\beta)mc_t + \beta E_t(\pi_{H,t+1} - \delta_H \pi_{H,t}) \qquad (5)$$

δ_H and θ_H captures the degree of price indexation and the probability of a firm to set prices to past inflation, respectively. When β denotes the intertemporal discount factor of the utility of households. mc_t is the real marginal cost function of each firm and takes the following functional form: $mc_t = \varphi y_t - (1+\varphi)\varepsilon_{a,t} + \alpha s_t + \sigma(1-h)^{-1}(c_t - hc_{t-1})$. This real marginal cost arises from the optimal production decision.

Retailers' inflation:

$$\pi_{F,t} - \delta_F F_{F,t-1} = \theta_F^{-1}(1-\theta_F)(1-\theta_F\beta)\psi_{F,t} + \beta E_t\left(\pi_{F,t+1} - \delta_F \pi_{F,t}\right) + \varepsilon_{p,t} \qquad (6)$$

All variables and parameters maintain the same meaning in equation (6) as equation (5), but refer to imported firms (subscript *F*). The equation also includes a shock parameter $\varepsilon_{cp,t}$.

Domestic inflation and home goods inflation:

Domestic inflation and home goods inflation are related according to equation (7):

$$\pi_t = \pi_{H,t} + \alpha \Delta s_t. \quad (7)$$

As noted, domestic inflation deviates from home goods inflation because of the terms of trade and the import share. As highlighted in the introduction, the imports share (α) is around 60% for Cabo Verde and Mauritius, and above 100% in Seychelles. Hence, a rise in imported inflation captured by the term of trade (Δs_t) will have a stronger impact on domestic inflation (higher *pass-through* effect).

Uncovered interest rate parity:

Briefly, this equation (8) mainly reflects the way domestic interest rate responds to the foreign interest rate. This effect is also affected by domestic and foreign inflation, the expected real exchange differential, the foreign asset position and the risk-premium.

$$(i_t - E_t\pi_{t+1}) - (i_t^* - E_t\pi_{t+1}^*) = E_t\Delta q_{t+1} - \chi a_t - \tilde{\phi}_t \quad (8)$$

Where $a_t = \log\left(\frac{e_t B_t}{P_t \bar{Y}}\right)$ is the log real net foreign asset position as a fraction of steady-state output. The latter and the parameter χ come from the manipulation of the risk-premium function: $\phi_t = exp\left[-\chi(A_t - \tilde{\phi}_t)\right]$ (Benigno, 2001; Kollmand, 2002; and Schmitt-Grohe & Uribe, 2003). $\tilde{\phi}_t$ denotes the risk-premium shock.

Budget constraint:

Equation (9) allows representing the balance constraint of the economy.

$$c_t + a_t = \beta^{-1} a_{t-1} - \alpha(s_t + \psi_{F,t}) + y_t \quad (9)$$

Taylor rule:

The monetary policy in a DSGE model is represented using the Taylor rule or the Taylor equation. The Cabo Verdean Central Bank pursues price stability as the main objective of its monetary policy, using the interest rate as an operational goal; and the exchange rate stability as an intermediate one to ensure the full convertibility of the currency. The latter is implemented under a conventional peg regime to the euro, in a context of free capital mobility (BO, 2002). Therefore, the Bank closely monitors the euro interbank offer rate (Euribor) to establish its operational goals. Hence, The Taylor rule equation is as follows:

$$i_t = \psi_i i_{t-1} + \psi_\pi \pi_t + \psi_y y_t + \psi_{\Delta y} \Delta y_t + \psi_{euribor} \Delta euribor_t + \varepsilon_{M,t} \quad (10)$$

Where i_t refers to the interest rate which is explained by the interest rate in the previous period (i_{t-1}), current inflation (π_t), current production (y_t), the production differences concerning the previous period (Δy_t) and the Euribor interest rate differential, also in respect to the previous period ($\Delta euribor_t$).

Both Mauritius and Seychelles adopt a floating exchange rate and aim at controlling inflation, but they conduct their monetary policy with slight differences. While the Mauritian monetary authority follows an interest-based policy using the overnight interbank interest rate as the operational target (BoM, 2006), Seychelles used money supply as the operational one (*monetary-aggregate-targeting*) from 2008 to 2019 (CBS, 2018).

The Taylor rule adopts the following function for Mauritius:

$$i_t = \psi_i i_{t-1} + \psi_\pi \pi_t + \psi_y y_t + \psi_{\Delta y} \Delta y_t + \psi_{er} \Delta er_t + \varepsilon_{M,t} \quad (11)$$

Where Δer_t refers to the exchange rate variation in respect to the previous period.

In the case of Seychelles, Li, O´Connell, Adam, Berg and Montiel (2016) propose the following Taylor rule when using monetary aggregate as operational goal (equation 12).

$$i_t = \frac{1}{\psi_{ma}}\left(\pi_t + \psi_{\Delta y}\Delta y_t + \Delta\varepsilon_{M,t}\right) - i_{t-1} \quad (12)$$

The advantage of this rule rests on modelling monetary aggregate, but without introducing a money demand equation in the model. In all cases, the monetary policy includes a monetary shock $\varepsilon_{M,t}$. Finally, y_t and Δer_t are introduced into the previous equation to provide a closer representation of the current monetary policy in this archipelago. In sum, the Taylor rule is as shown in equation (13):

$$i_t = \frac{1}{\psi_{ma}}\left(\pi_t + \psi_{\Delta y}\Delta y_t + \psi_y y_t + \psi_{er}\Delta er_t + \Delta\varepsilon_{M,t}\right) - i_{t-1} \quad (13)$$

Foreign economy block:

Finally, we assume the following first-order autoregressive model (AR(1)) to describe the exogenous evolution of the foreign economy in Cabo Verde, Mauritius and Seychelles (equations 14, 15, 16 and 17).

$$c^*_{tour,t} = \rho_{tour} c^*_{tour,t-1} + \varepsilon_{tour,t} \quad (14)$$

$$x^*_{,t} = \rho_{exports} x^*_{,t-1} + \varepsilon_{exports,t} \quad (15)$$

$$r^*_t = \rho_{interest} r^*_{t-1} + \varepsilon_{interest,t} \quad (16)$$

$$\pi^*_t = \rho_{inflation} \pi^*_{t-1} + \varepsilon_{inflation,t} \quad (17)$$

Dataset, calibration and estimation

The observed variables of the model for the three economies are: GDP in current prices (y_t), inflation rate (π_t), interest rate (r_t), real exchange rate (q_t), consumption (c_t)[3], tourism receipts ($c^*_{tour,t}$)[4], remaining exports (x^*_t) and the foreign debt ratio (a_t)[5] and the nominal exchange rate (er_t) [6]. The observed variables for the Eurozone are: inflation rate (π^*_t) and Euribor (r^*_t). The time series were sourced from the Caboverdian Statistical institute, The National Bureau of Statistics of Seychelles, the European Statistical Office (Eurostat) and the IMF database (International Financial Statistics); and cover the period 2007Q1-2019Q2. An essential strength of SDGE algorithm is the capability of achieving a fast convergence in the estimation, even in short samples (Herbst & Schorfheide, 2016).

A Hodrick-Prescott filter was applied to the logged time series to remove the cyclical component and to obtain a smoother representation of the time series (stationarity) to fit the log-linearised model better. Finally, three more shocks were introduced in the measurement equations of the observed variables: y_t, x^*_t, r_t, to avoid singularity problems. Hence, the number of observed variables equate to the number of shocks in the SDGE model. According to Iskrev (2010), there is no consensus about the number of observable variables and the identification of parameters. Nonetheless, quoting the author (2010, page 200): "*the variables differ in the sensitivity of their moments to the*

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[3] There is no quarterly consumption data available for Seychelles.

[4] There are no quarterly tourism data available for Cabo Verde and Mauritius. In these cases, the tourism receipts were proxied using the expenditure in service export activities. In the case of Cabo Verde, it should be noted that tourism receipts average around 75% of services exports from 2007 to 2019. For Mauritius, this share is significantly lower (around 20% of services exports), but both series show a strong correlation of 86% for the period 1995-2018. Finally, in the case of Seychelles, there are quarterly data of tourism arrivals for the selected time frame.

[5] The foreign debt ratio is measured by the "net acquisition of financial assets", sourced from the financial account of the Balance of Payment. This variable could not be used for Mauritius and Seychelles due to the abundance of negative values which prevented the application of the Hodrick-Prescott filter.

[6] This variable is only observable for Mauritius and Seychelles which operate under a floating xchange rate regime.

parameters. This implies that the choice of observables would have consequences for the precision with which different parameters may be estimated". In consequence, we run a sensitivity analysis based on Ratto and Iskrev (2010). This analysis reports misleading information. On the one hand, the reduced-form and Spectrum analysis confirm that all parameters are identified. On the other hand, the test of moments detects identification problems in some errors terms when, precisely, these errors are introduced *vis-a-vis* with the observable variables to avoid singularity issues in the estimation. In sum, we can not reduce the number of errors without reducing the number of observable variables.

The estimation process covers two steps. Firstly, the AR (1) models of the foreign economy were estimated independently to calibrate their respective parameters (ρ_{tour}, $\rho_{exports}$, $\rho_{interest}$, $\rho_{inflation}$). Secondly, these estimated parameters, alongside their respective equations, were introduced in the SDGE model. Secondly, a series of structural parameters were estimated in the Bayesian regression (Table 2). Their means and distribution (inverse gamma) were sourced from Justiano and Preston (2010), while the standard deviation were obtained from (Kolasa, 2009). The latter assume higher standard deviations more in accordance with the value expected in developing economies, like that of Cabo Verde, Mauritius and Seychelles. In any case, the choice of the mean and std. deviations of the priors is also a source of debate. Fernández-Villaverde (2010) highlights two possible strategies when eliciting the values of the priors: either give more importance to the likelihood by assuming loose priors, or, conversely, adopt tighter priors. The author recommends the latter when the model is for policy analysis and the former when conducting research. In the case of Justiano and Preston (2010), the authors choose loose priors for those parameters that show a larger estimate variation in the literature. Finally, Table 1 shows the value of the parameters that remain fixed in the estimation.

[Table 1 about here]

Results

Bayesian regression

Table 2 shows the results of the Bayesian econometric regression after 1,000,000 runs. h reports a low mean value for Cabo Verde and Mauritius (0.08 and 0.07, respectively) when compared with the prior one, showing the lack of habit persistency in Cabo Verdian and Mauritian consumption. Adolfson, Laséen, Lindé and Villani (2008) also report a similar value for habit formation when assuming fixed exchange rate rules in Sweden. Conversely, Seychelles reports a higher mean value (0.29).

Both domestic and imported firms show a low and similar degree of price indexation in the three economies (δ_H=0.06 and δ_F=0.11 in Cabo Verde, δ_H=0.08 and δ_F=0.13 in Mauritius, and δ_H=0.05 and δ_F=0.10 in Seychelles), meanwhile the probability of indexation to past inflation (θ_H and θ_F) remain high in the Cabo Verdian and Mauritian economies, whereas it is slightly lower in Seychelles. These results are broadly in line with economies with low inflation rates such as Sweden, Australia, Canada, USA, New Zealand, Spain and South Africa (Adolfson et al, 2008; Justiniano and Preston, 2010, Gupta and Steinbach, 2013; and Burriel, Fernández-Villaverde and Rubio-Ramírez, 2010). But they are significantly lower than Poland: an inflation-targeting economy that also has strong economic ties with the Eurozone (Kolasa, 2009). The risk premium (χ) in takes a value of 0.17, 0.07 and 0.29 for Cabo Verde, Mauritius and Seychelles, respectively, which is larger than that estimated by Adolfson et al (2008) for Sweden. The estimate of Justiniano and Preston (2010) is not comparable because they assume an AR(1) process for the risk-premium, which show strong inertia. Overall, the risk-premium of the three economies is much lower than other developing economies, such as

Brazil, Colombia, Chile, Peru or Mexico, where it is above 1.40 (McKnight, Mihailov & Rangel, 2020).

Regarding monetary policy, it shows certain interest rate and inflation rate inertia in Cabo Verde and Mauritius (ψ_i= 0.53 in both economies, and ψ_π=0.75; and ψ_π=0.42 in Cabo Verde and Mauritius, respectively), while the monetary aggregate target in Seychelles entails a tight monetary discipline (ψ_{ma}= 0.68). The results are in line with the cases of small-open economies such as Australia, Canada and New Zealand (Justiniano and Preston, 2010).

[Table 2 about here]

Optimal monetary policy

Optimal monetary policy consists in minimising the quadratic loss function of the form (Juillard, 2011):

$$min_\gamma E(y_t' W y_t)$$

s.t:

$$A_1 E_1 y_{t+1} + A_2 y_t + A_3 y_{t-1} + C e_t = 0$$

The constraint represents the SDGE equations, where y_t is the vector of endogenous variables, e_t is the vector of shocks and A_1, A_2, A_3 and C refer to coefficient matrices. γ is a subset of parameters of A_1, A_2 and A_3 (pertained to the policy rule equation) that minimises the quadratic loss function. Finally, W is a semi-definitive matrix representing the weight of the loss function. The latter can be alternatively expressed as a minimising weighted sum of variances and covariances of endogenous variables: $\sum_{i=1}^{n} \lambda var(y_{i,t})$ „ , where λ now denotes the weight of each variable in the loss function (in our case, it takes value 1 for all variances and covariances of the endogenous variables). In sum, the problem seeks to identify the optimal values of the parameters of the Taylor rule equation to minimise the welfare loss; constrained to the remaining equations and parameters of the SDGE model. In our case, we aim to analyse the optimal monetary policy response when addressing a tourism demand shock of 4.4%, which is the forecast of the World Tourism Organisation for developing economies for the period 2010-2030 (UNWTO, 2011). This shock is analysed assuming different Taylor rules representing different monetary policy regimes: one conventional peg (**CP**) and three alternative flexible exchange rate rules: a standard *inflation-targeting* rule (**IT),** *inflation-targeting* rule with managed exchange rate (**IT-ER**). And finally, an *imported-inflation-targeting* (**M-IT**):

CP: $i_t = \psi_i i_{t-1} + \psi_\pi \pi_t + \psi_y y_t + \psi_{\Delta y} \Delta y_t + \psi_{euribor} \Delta euribor_t + \varepsilon_{M,t}$

IT, IT-ER and M-IT: $i = \psi_i i_{t-1} + \psi_\pi \pi_t + \psi_y y_t + \psi_{\Delta y} \Delta y_t + \psi_e \Delta e_t + \varepsilon_{M,t}$

On the one hand, the CP rule aims at minimising inflation volatility by deciding the optimal values of this Taylor rule assuming a fixed exchange rate to the euro ($\Delta euribor_t$). Hence the bank implements its monetary policy by paying close attention to the evolution of the Euribor. the optimal policy calculate the optimal values of ψ_i, ψ_π, ψ_e, ψ_y, $\psi_{\Delta y}$ and $\psi_{euribor}$ to address this minimising criteria.

On the other hand, IT, IT-ER and M-IT follow the same Taylor rule, but in this case replacing Euribor variations ($\Delta euribor_t$) by exchange rate variations (Δe_t). The IT seeks to minimise inflation variation, whereas IT+ER minimises inflation and exchange rate variations (managed exchange rate). Finally, M-IT minimises imported inflation variations. In all cases, the optimal policy calculate the optimal values of ψ_i, ψ_π, ψ_e, ψ_y, $\psi_{\Delta y}$ and ψ_e to address the respective minimising criteria.

Table 3 reports the estimated values of the Taylor rules and the variance of the respective objectives loss function for the three economies. In the Conventional peg (CP), a 1% rise in the Euribor ($\psi_{euribor}$) implies an increase in the domestic interest rate of a similar magnitude un the three cases: 0.47%, 0.49% and 0.51% for Cabo Verde, Mauritius and Seychelles, respectively. Analysing the exchange rate variations ($\psi_{\Delta er}$), it is considerably higher for Seychelles whose values are, on average, above 0.92 for the three free-floating regimes (IT, IT-ER and M-IT). The latter reflects the higher *home-bias* in this country. Except for this previous effect in Seychelles, the one-period lagged interest rate (ψ_i) shows the highest values in the four monetary policy scenarios and in the three economies, which is never below 0.7. The IT-ER and I-IT policies tighten the one-period lagged interest rate, especially in Seychelles, while they soften the importance of inflation. Finally, regarding the volatility of the main macroeconomics variables, the CP policy provides the lowest volatility under a tourism demand shock in Cabo Verde and Seychelles, while the CP, the IT-ER and the M-IT show similar volatility in Mauritius.

[Table 3 about here]

Figure 2 shows the impulse-response functions (IRF) of the tourism demand shock to some key economic variables under a CP (green-line), an IT (red-line), an IT-ER policy (blue-line) and a M-IT (black-line). Initially, the tourism shock increases consumption (c) and triggers a real exchange rate appreciation (q); a general finding in tourism (Adams & Parmenter, 1995; Inchausti-Sintes, 2015; Narayan, 2004; Capó, Riera & Roselló, 2007). However, the intensity of the effects varies depending on the monetary policy under analysis. For instance, the real exchange rate and consumption react more sharply under the IT-ER and M-IT policy in the three economies, although in the case of Seychelles, the IT policy also mimics the performance of the other two. However, in term of production, the four monetary policies generate the same impact.

Comparing by countries, initially, the tourism demand shock triggers the highest real exchange appreciation and the highest rise in production in Cabo Verde. On the contrary, the tourism demand shock causes a higher appreciation of the real exchange rate in

Mauritius than in Seychelles. However, the rise in production is higher in the latter. Similarly, the variation in the real exchange rate affects more markedly the inflation in Cabo Verde and Seychelles than in Mauritius, which means that Cabo Verde and Seychelles suffer from a higher *pass-through* effect.

Nevertheless, the reaction of the interest rate (*r*) is similar in Mauritius and Seychelles, but significantly higher in Cabo Verde. The foreign debt ratio (*a*) show a sharp rise accompanied by higher inertia in the forthcoming periods in all cases, but the rise is higher in Cabo Verde and Seychelles.

Next, the aftermath of this tourism shock implies a progressive fall in consumption and production that is boosted by the higher interest rate, while the real exchange rate faces successive depreciations. The exchange rate flexibility in IT, IT-ER and M-IT allows for a pronounced "foreign" depreciation as observed when analysing the peak in the one-price-law gap. This effect is more marked in Mauritius and Seychelles than in Cabo Verde, whereas the real exchange rate depreciates more sharply in Seychelles.

In sum, the CP policy attains the lowest inflation, imported inflation and interest rate variation. Nevertheless, the rise in inflation in the other three policies is very mild, while consumption and the external competitiveness measured by the one-price-law gap rise more sharply with them. Moreover, the higher rise in the interest rate in the *floating* cases (IT, IT-ER and M-IT) is corrected sharply in the following periods; limiting the harmful initial effects. Hence, there is room for adopting different sorts of policies in these three economies capable of providing suitable monetary policy responses.

[Figure 2 about here]

Conclusions and limitations

The aim of this analysis was not to prescribe or recommend an alternative monetary policy in these three economies, but to explore, for the first time, the consequences of adopting different policies under a tourism demand shock. According to the results, either *pegged* or *floating rules* cannot avoid the classical tourism economic impact such as real exchange appreciation. But the latter may be reduced under a conventional peg policy.

On the one hand, the four monetary policies yield similar results in terms of production and foreign debt ratio, but the CP policy attains a smoother economic outcome after the tourism demand shock. Moreover, the use of Euribor as a nominal anchor in the conventional peg reduces domestic interest rate volatility significantly, but, at the same time, it restrains larger foreign depreciation.

On the other hand, the *inflation-targeting* policy provides the closest performance to the latter. However, the rise in inflation is slightly higher, while consumption and the external competitiveness rise more sharply with the others than with the CP. The other two *floating* policies (IT-ER and M-IT) provide sharper economic improvement in the aforementioned economic variables than in the IT policy, while the inflation is also higher. However, the latter evolves under manageable thresholds. Hence, there is room for adopting alternative sorts of monetary policies capable of providing suitable responses.

Comparing by countries, initially, the tourism demand shock triggers a sharper real exchange rate appreciation that affects more markedly the inflation in Cabo Verde and Seychelles than in Mauritius, showing a higher *pass-through* in both cases. Nevertheless, the reaction of the interest rate is similar in Mauritius and Seychelles, but significantly higher in Cabo Verde. The improvement in production is also more significant in the latter. Curiously, while the tourism demand shock causes a higher appreciation of the real exchange rate in Mauritius than in Seychelles, the rise in production is higher in the latter. The foreign debt ratio shows a sharp increase followed by higher inertia in the forthcoming periods in all cases, but the rise is higher in Cabo Verde and Seychelles.

The aftermath of this tourism shock implies a depreciation of the real exchange in the three economies. This depreciation is of similar magnitude in Cabo Verde and Mauritius, but considerably higher in Seychelles. The exchange rate flexibility in IT, IT-ER and M-IT allows for a pronounced "foreign" depreciation as observed when analysing the peak in the one-price-law gap. This effect is more marked in Mauritius and Seychelles than in Cabo Verde.

Regarding the optimal response policies, the CP policy achieves the lowest volatility in the main macroeconomics variables in Cabo Verde and Seychelles, while the CP, the IT-ER and the M-IT show similar volatility in Mauritius. It is worth mentioning the sharp response to the exchange rate variation in the *floating* rules in Seychelles, mainly caused by the higher imports dependence. Except for this last effect in Seychelles, the one-period lagged interest rate shows the highest values in the four monetary policy scenarios and the three economies. The IT-ER and I-IT policies tighten the one-period lagged interest rate, especially in Seychelles, while they soften the importance of inflation.

Finally, we would like to briefly summarise the potential improvements and limitations of the SDGE model. Firstly, the analysis might be enriched by relaxing some assumptions (e.g. allowing wage indexation or unemployment) or including new financial behaviours that affect the conduction of monetary policy such as dollarization. Secondly, the SDGE model should reconsider the role of the PPP to explain the behaviour of the terms of trade, the real exchange rate or the nominal exchange rate. This would drive the model towards a long-term equilibrium, minimising the influence of the interest rate (uncovered interest rate parity) in the macroeconomic variables and the conduction of monetary policy in the short term.

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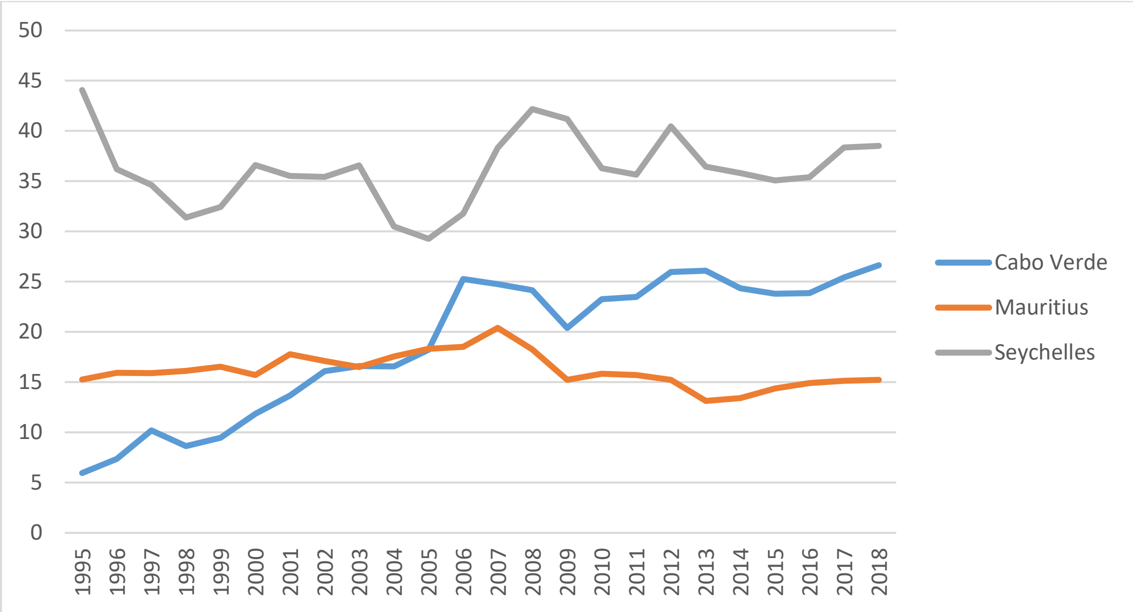
Figure 1. Evolution of tourism receipts (% of GDP).



Source: World Bank

Table 1. Fixed parameters in the SDGE model.

Parameter	Cabo Verde value	Mauritius value	Seychelles value
$\psi_{euribor}$	0.5	-	-
ψ_{er}	-	0.5	-
β	0.99	0.99	0.99
α	0.65	0.60	1.01
α_x	0.25	0.67	0.62
α_{tour}	0.75	0.33	0.38
σ	0.88	0.88	0.88
η	0.8	0.8	0.8
ρ_{tour}	0.36	0.402	0.17
$\rho_{exports}$	0.8	0.8	0.28
$\rho_{interest}$	0.69	0.69	0.69
$\rho_{inflation}$	0.079	0.079	0.079

Table 2. Estimates of the SDGE model.

	Prior values		**Posterior values**						**Distribution**
			Cabo Verde		**Mauritius**		**Seychelles**		
	mean	**Std.dev**	**mean**	**Std.dev**	**mean**	**Std.dev**	**mean**	**Std.dev**	
h	0.30	0.1	0.08	0.007	0.07	0.007	0.29	0.099	beta
δ_H	0.06	0.1	0.06	0.004	0.08	0.004	0.05	0.051	beta
θ_H	0.69	0.1	0.89	0.008	0.88	0.021	0.77	0.069	beta
δ_F	0.10	0.1	0.11	0.003	0.13	0.003	0.10	0.053	beta
θ_F	0.41	0.1	0.52	0.015	0.61	0.015	0.43	0.057	beta
χ	0.30	0.1	0.17	0.008	0.07	0.008	0.29	0.100	beta
ψ_i	0.74	0.1	0.53	0.006	0.53	0.006	-	-	beta
ψ_π	0.5	0.1	0.57	0.007	0.42	0.007	-	-	beta
ψ_y	0.08	0.1	0.45	0.003	0.24	0.003	-	-	beta
$\psi_{\Delta y}$	0.67	0.1	0.73	0.024	0.53	0.020	-	-	beta
$\psi_{\Delta er}$	0.5	0.1	-	0.021	0.47	0.021	-	-	beta
					-	-	-	-	
ψ_{ma}	-	-	-	-	-	-	0.68	0.111	beta
$\varepsilon_{tour,t}$	0.1	inf	0.08	0.008	0.11	0.031	0.07	0.008	Inverse gamma
$\varepsilon_{m,t}$	0.1	inf	0.15	0.005	0.06	0.005	0.04	0.011	Inverse gamma
$\varepsilon_{yobs,t}$	0.1	inf	0.02	0.0028	0.02	0.006	0.08	0.010	Inverse gamma
$\varepsilon_{\pi obs,t}$	0.1	inf	0.01	0.0012	0.02	0.004	0.03	0.004	Inverse gamma
$\tilde{\phi}_t$	0.3	inf	0.19	0.0948	0.07	0.019	0.09	0.019	Inverse gamma
$\varepsilon_{robs,t}$	0.1	inf	0.33	0.0145	0.43	0.037	3.78	0.376	Inverse gamma
$\varepsilon_{xobs,t}$	0.1	inf	0.15	0.0019	0.1	0.010	0.13	0.0136	Inverse gamma
$\varepsilon_{tourobs,t}$	0.1	inf	0.06	0.0011	0.09	0.243	0.08	0.0551	Inverse gamma
$\varepsilon_{qobs,t}$	0.1	inf	0.09	0.0077	0.05	0.012	0.16	0.0198	Inverse gamma
$\varepsilon_{aobs,t}$	0.1	inf	0.19	0.0173	0.07	0.015	0.07	0.0089	Inverse gamma
$\varepsilon_{r^*obs,t}$	0.1	inf	0.53	0.0162	0.53	0.058	0.53	0.0536	Inverse gamma
$\varepsilon_{\pi^*obs,t}$	0.1	inf	0.01	0.008	0.01	0.009	0.01	0.0009	Inverse gamma

Table 3. Optimal monetary policy response to a tourism demand shock

	Cabo Verde			
	CP	**IT**	**IT + ER**	**I-IT**
ψ_i	0.76	0.73	0.85	0.83
ψ_π	0.66	0.62	0.34	0.43
$\psi_{\Delta y}$	0.04	0.09	0.09	0.09
ψ_y	0	0	0	0
ψ_e	-	0.51	0.55	0.55
$\psi_{euribor}$	0.47	-	-	-
Std.dev				
Inflation	0.0006	0.0012	0.0014	0.0014
Production	0.0437	0.0407	0.0407	0.0408
Exchange rate	-	0.0113	0.0088	0.0088
Interest rate	0.0021	0.0077	0.0080	0.0082
Consumption	0.0204	0.0212	0.0216	0.0216
	Mauritius			
	CP	**IT**	**IT + ER**	**M-IT**
ψ_i	0.75	0.70	0.77	0.74
ψ_π	0.62	0.61	0.59	0.64
$\psi_{\Delta y}$	0.06	0.07	0.10	0.13
ψ_y	0	0	0	0
ψ_e	-	0.48	0.60	0.54
$\psi_{euribor}$	0.49	-	-	-
Std.dev				
Inflation	0.002	0.0087	0.0004	0.0004
Production	0.016	0.0155	0.0159	0.0160
Exchange rate	-	0.0052	0.0038	0.0039
Interest rate	0.0011	0.0028	0.0038	0.0039
Consumption	0.0085	0.0087	0.0091	0.0091
	Seychelles			
	CP	**IT**	**IT + ER**	**M-IT**
ψ_i	0.78	0.84	0.93	0.82
ψ_π	0.64	0.51	0.61	0.27
$\psi_{\Delta y}$	0	0.04	0.021	0.06
ψ_y	0	0	0	0
ψ_e	-	0.94	1.06	0.76
$\psi_{euribor}$	0.51	-	-	-
Std.dev				
Inflation	0.0005	0.0015	0.0015	0.0015
Production	0.0291	0.0268	0.0267	0.0267
Exchange rate	-	0.0042	0.0040	0.0042
Interest rate	0.0010	0.0045	0.0041	0.0044
Consumption	0.0099	0.0102	0.0101	0.0102

Figure 2. Impulse response function of a tourism demand shock in Cabo Verde (%).

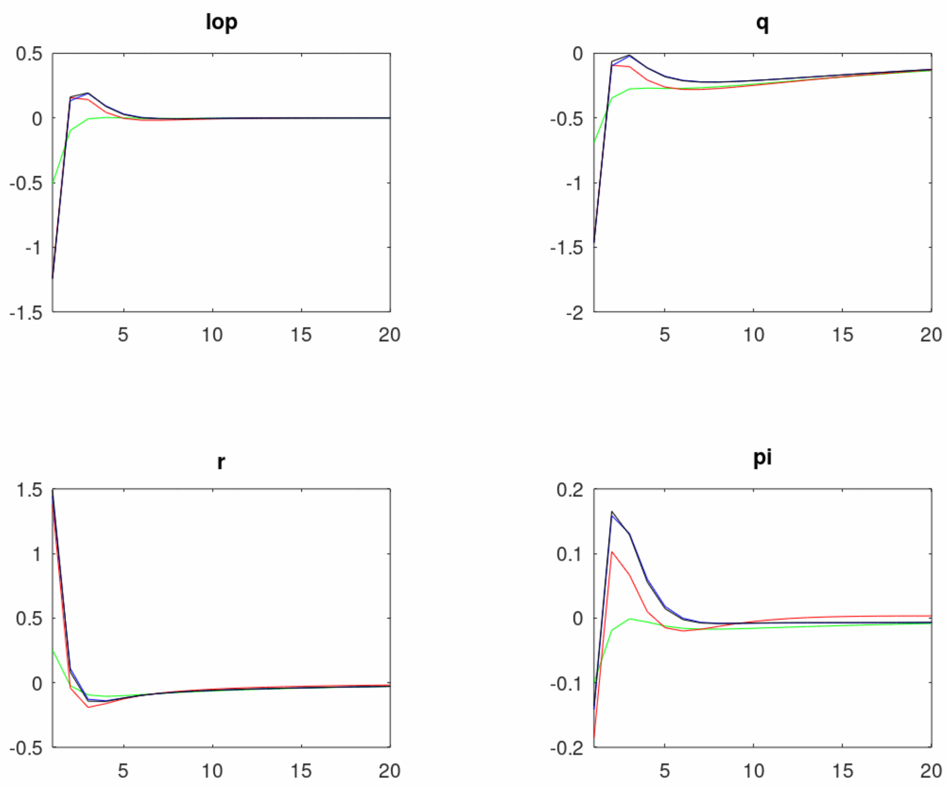


Figure 2 (continue). Impulse response function of a tourism demand shock in Cabo Verde (%).

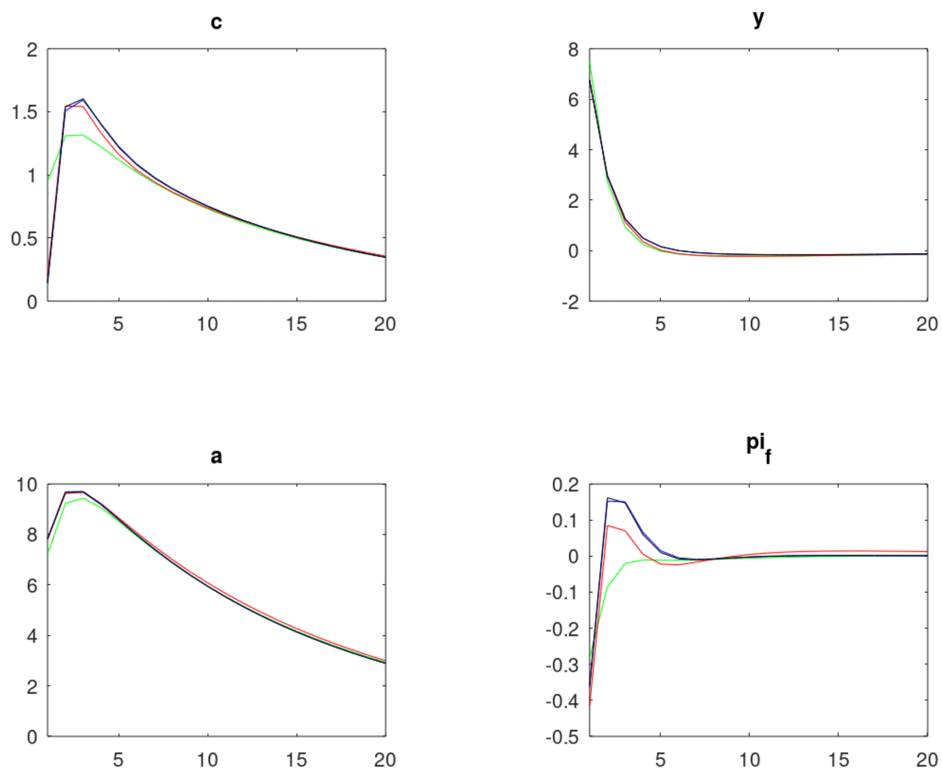


Figure 2. Impulse response function of a tourism demand shock in Mauritius (%).

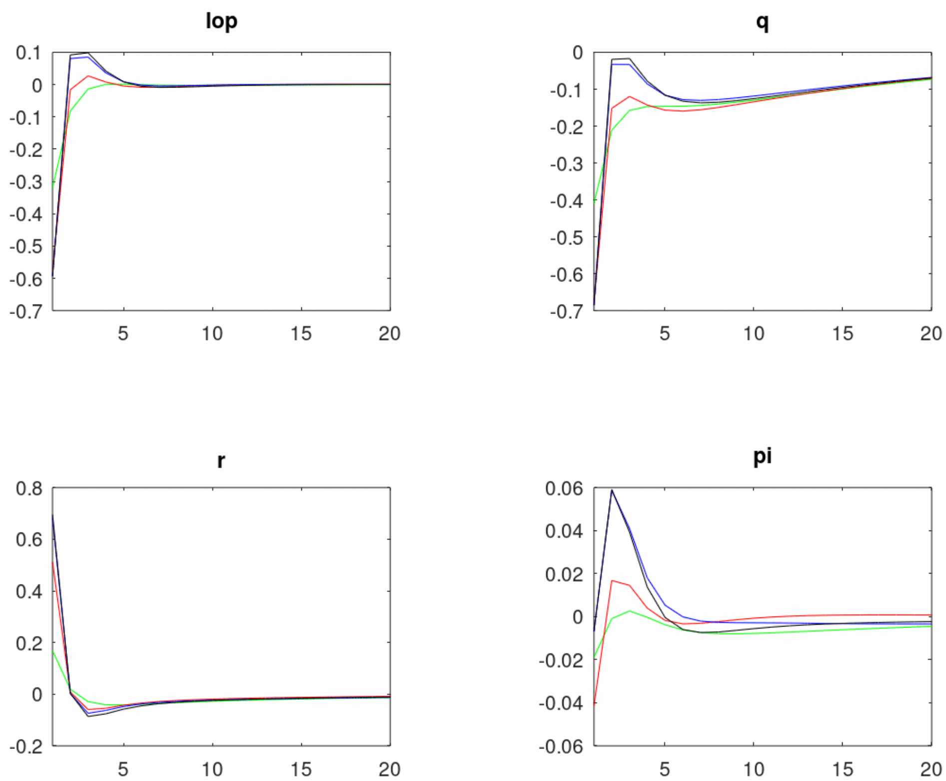


Figure 2 (continue). Impulse response function of a tourism demand shock in Mauritius (%).

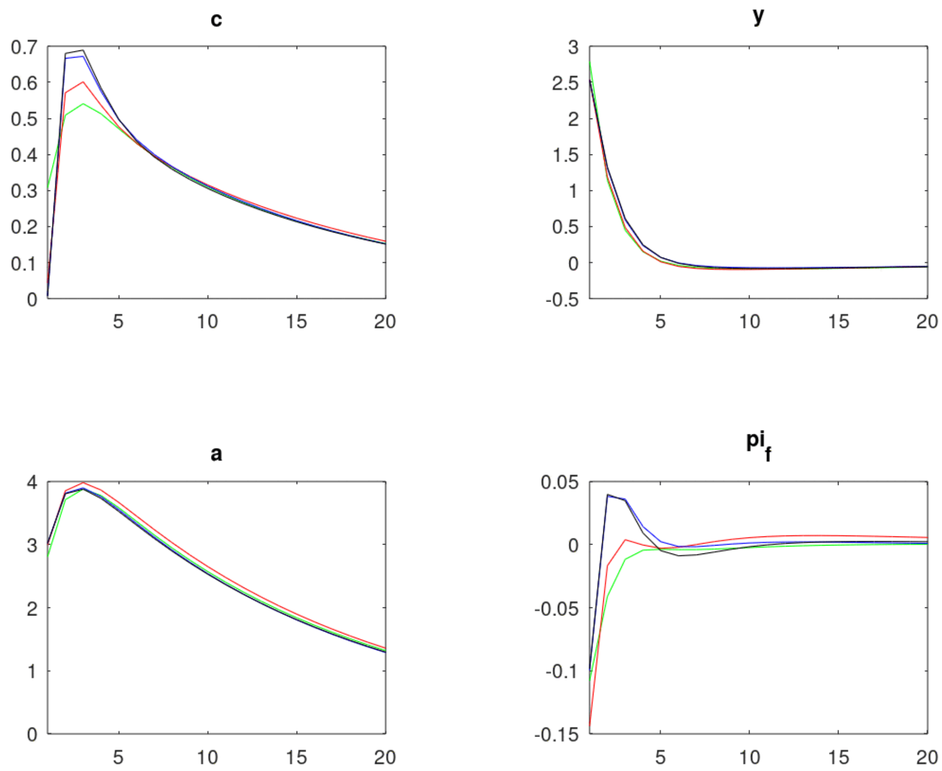


Figure 2. Impulse response function of a tourism demand shock in Seychelles (%).

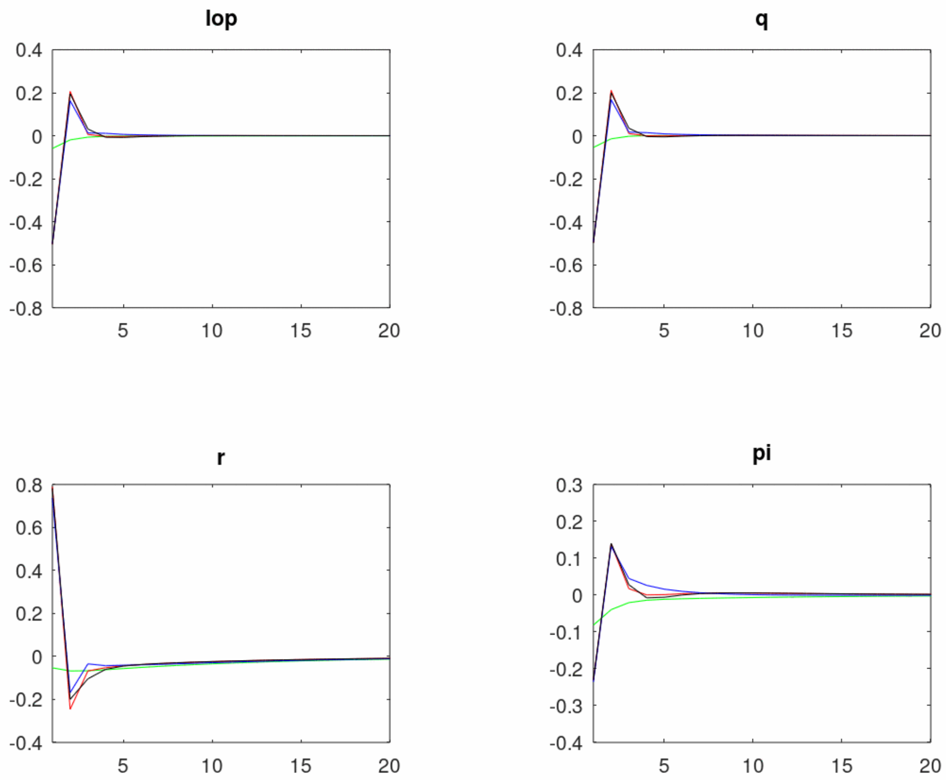


Figure 2 (continue). Impulse response function of a tourism demand shock in Seychelles (%).