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Long and Short-term Impact of Tourism on Growth in Small Developing States

Daniel Carvalho Cunha, Rodrigo Garcia-Verdu, Pedro Jucá Maciel[†]

May 16, 2025

Abstract

We explore the relationship of recessions and tourism cycles on the economic performance of tourism-dependent Small Developing States (SDS). Using local projections regressions, we examine how these cycles affect potential output growth and its drivers—investment and employment—and estimate the short-run elasticity of tourism growth to economic activity. Our findings reveal that the long-term influence of recessions are less persistent in SDS than in larger emerging markets, as tourist-dependent economies experience faster recoveries from recessions. Moreover, we use Cabo Verde as a natural experiment to assess the short-term relation of tourism on growth and found that tourism's short-run elasticity to growth is around 0.4 over 12 months, with limited spillovers to non-tourism areas.

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1 Introduction

How resilient is potential growth to tourism busts, and how large are the short-run spillovers from tourism to other sectors in Small Developing States (SDS)? These are the central questions this paper seeks to answer. We find that recessions have less persistent impacts on potential growth in SDS compared to emerging markets[1], and that the short-run elasticity of GDP to tourism in Cabo Verde is around 0.4, with limited spillovers to non-tourism regions. These findings highlight both the resilience and vulnerability of SDS to tourism shocks and offer clear policy implications, including the need for stronger integration of non-tourism regions into the tourism value chain.

To provide a comprehensive understanding, the analysis is divided into two distinct temporal horizons. The long-term assessment section examines how tourism affects potential growth and other key economic variables, such as investment, labor, and productivity. The short-term assessment section estimates the elasticity of economic activity to changes in tourism over a twelve-month horizon Using Cabo Verde as a natural experiment, we study how immediate shifts in tourism influence local economic metrics, particularly through variations in island-level VAT collections. Cabo Verde provides an ideal natural experiment to analyze the short-term relations of tourism on economic activity, thanks to its unique geographic and economic characteristics. The country's archipelagic structure, characterized by limited inter-island connectivity and high reliance on international imports, ensures isolation of tourism shocks on specific islands, satisfying critical econometric assumptions (SUTVA). Moreover, by focusing on Cabo Verde, our analysis avoids complexities from cross-border tourist spillovers common in broader studies, and leverages the country's robust high-frequency data to precisely estimate tourism elasticity and short-run economic performance.

The vulnerabilities of tourism-dependent SDS are well documented in the literature [(Briguglio, 2016), (Briguglio and Vella, 2018), and (International Monetary Fund, 2024)]. These countries face unique structural constraints due to small population sizes, limited economic diversification, high trade openness, and heightened exposure to external shocks—including climate change, commodity price volatility, and fluctuations in tourism demand. Sectoral concentration in tourism or commodities compounds these risks, limiting resilience and policy space. Despite this extensive documentation of vulnerabilities, far less is known about the macroeconomic dynamics of tourism-led recessions and their longer-term effects on potential growth, investment, labor, and productivity in SDS.

This paper seeks to close that gap. We focus on tourism-dependent SDS to explore both upside and downside risks to growth, particularly in the context of recessions and tourism shocks. Our contribution is twofold: first, we assess how tourism shocks affect potential output and its key

[1]It is important to clarify that the study aims to explore relations between variables, and any claims of causality must be approached with caution. The results derived from our analysis are based on statistical correlations and should not be interpreted as definitive evidence of causal relationships.

drivers over a multi-year horizon; second, we quantify short-run GDP elasticities to tourist arrivals using high-frequency data from Cabo Verde.

Over the past decades, SDS economies have experienced more volatile growth rates than other emerging markets and developing nations. The Global Financial Crisis (GFC) and the COVID-19 pandemic have exacerbated these challenges, disproportionately affecting SDS compared to Low-Income Countries (LICs) and fragile states. The shutdown of the tourism sector during the COVID-19 pandemic had a particularly severe impact on SDS, given their dependence on tourism as a primary economic driver. This paper contributes to the literature by examining how tourism shocks, in addition to broader economic recessions, influence the potential growth of tourism-dependent SDS. By analyzing the interplay between these shocks and economic resilience, we aim to provide policymakers with information on how these economies can better withstand external shocks.

Our empirical approach is informed by and extends several strands of literature. Long-term analysis is based on studies that examine how recessions affect potential production, investment, and productivity, particularly in advanced and emerging economies [e.g., (Fatás, 2000) (Anzoategui and Martinez, 2019), and (Çelik et al., 2023)]. However, most of this work overlooks SDS, whose structural features—such as high tourism dependence—necessitate tailored approaches. For the short-run analysis, we draw on research linking tourism to growth via sectoral spillovers [(Sinclair, 1998), (Nowak et al., 2007)], but depart from input-output and general equilibrium models by using high-frequency VAT data in a reduced-form framework. By leveraging Cabo Verde's island geography, we treat islands as a natural experiment to identify the local economic response to tourism shocks.

The paper is structured as follows: Section 2 highlights new key stylized facts of tourism-dependent SDS. Section 3 explains the recent economic developments of SDS, highlighting the particular challenges faced by the tourism-based economies compared to other Emerging and Developing Economies (EMDEs) peers. Section 4 outlines the empirical strategy, detailing the data sources, measurements, and model specifications employed in our analysis. Section 5 presents the results from the empirical estimations, discussing both short-term and long-term relation of tourism on potential output growth. The short-term analysis is based on the application of the methodology to the Cabo Verde economy. Section 6 assesses the robustness of the estimates by applying broader and narrower definitions of economic recessions and expansions and different specifications for the estimation of short-term elasticity of tourism. Section 7 concludes with a summary of the findings and offers policy implications in tourism-dependent economies.

2 Stylized facts

Economic Performance in Tourism-dependent SDS. Based on the definition of Tourism-based Small SDS economies from the IMF (2024)[2], Table 1 provides valuable insights into the economic growth and related dynamics in these countries, which heavily rely on tourism as a key driver of their economies[3]. One striking observation is the low AR(1) coefficient of GDP growth in tourism-dependent SDS. Aguiar and Gopinath (2007) find that in emerging markets the cycle often behaves as the trend, with GDP growth exhibiting higher volatility but also greater persistence than in advanced economies. One possible explanation to this discrepancy is related to the unique nature of tourism-dependent SDS, where economic growth is highly sensitive to external shocks, particularly fluctuations in tourism demand from advanced economies. Notably, Tourism-based SDS and Advanced Economies exhibit the lowest standard deviation in trend GDP growth among the groups analyzed. This observation challenges the notion that the low volatility in trend growth is primarily driven by scale (small population size) and instead underscores the stabilizing influence of tourism as a key economic driver in these economies.

Tourism-dependent SDS tend to grow faster after recessions than EMs peers, but we know little about the impact of tourism on the economic activity. We identify recessions, following Çelik et al. (2023), as the period starting from a peak in output preceding a business cycle trough to the trough through to the trough, with a trough defined as a year in which output growth is both negative and at least one standard deviation below its long-term mean. The sample analyzed includes 44 recessions in 19 tourism-dependent SDS during 1996-2023. The history of recessions reveals that post-crises growth rates in SDS have risen above pre-crises levels. For example, the level of output in Cabo Verde has recovered to the post-recession level faster than other SDS and EMDEs. While Cabo Verde experienced a sharper drop in growth rates during the crises, the differential in growth rates after the recessions was substantial enough to more than offset the deeper impact initially experienced. Despite the strong trend in tourism growth and, thus, economic growth in Cabo Verde, the performance could be even better due to the lack of efficient inter-island connectivity and a tourism business model focusing on all-inclusive resorts in only two islands (Sal and Boa Vista).

[2]Tourism-based SDS are defined as countries where international tourism receipts exceed 15 percent of GDP and 25 percent of total exports, making tourism a central pillar of their economic structure.

[3]The patterns shown in Table 1 remain similar for the pre-covid period (1980-2019)

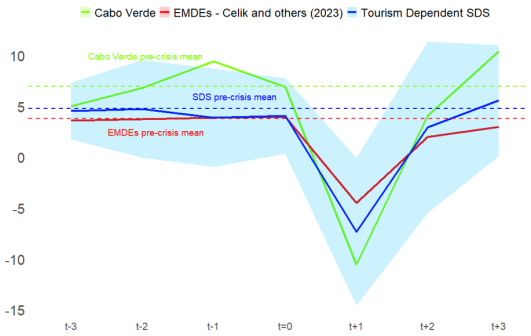
Table 1: Cabo Verde and Peers Economic Group Statistics Table (Averages 1980-2023)

Metric	AEs	EMs	LICs	Non-Tourism SDS	Tourism SDS	Cabo Verde
σ(GDP Growth)	3.68	5.31	5.47	5.53	5.13	5.49
σ(Cyclical GDP Growth)	3.18	4.39	4.46	4.40	4.75	5.02
σ(Trend GDP Growth)	1.41	2.18	2.42	2.52	1.42	1.85
ρ(GDP Growth)	0.36	0.31	0.32	0.40	0.02	0.06
ρ(Cyclical GDP Growth)	0.00	-0.06	-0.05	-0.12	-0.16	-0.10
ρ(Trend GDP Growth)	0.96	0.93	0.95	0.93	0.96	0.98

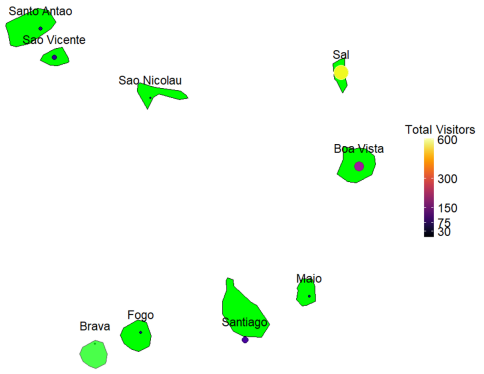
Note: This table lists average values of the moments for the five economic groups: Advanced Economies (42 countries), Emerging Markets (67 countries), Low-Income Developing Countries (55 countries), Non-Tourism SDS (13 countries), and Tourism SDS (15 countries). The values are calculated for each group separately, with GDP growth decomposed into cyclical and trend components using the Hodrick-Prescott (HP) filter with a smoothing parameter of 100. The standard deviations are in percentage terms, and AR(1) coefficients (ρ) are calculated for actual GDP growth, cyclical GDP growth, and trend GDP growth.

Figure 1: Recoveries from Recessions and Tourism Concentration

(a) Recoveries in Tourism-dependent SDS 1996-2023



(b) Cabo Verde Foreign Visitors in 2022 (Thousand)



Source: IMF, INE, and Authors' own calculations

3 Data

3.1 Long-term assessment of recessions and expansions

Table 2 revels that while the **Actual GDP Growth** for these countries averages around 2.64 percent, there is significant variability with a standard deviation of 5.63 percent. This demonstrates the vulnerability of these economies to external shocks, such as global economic downturns or natural disasters, which can severely disrupt tourism inflows. The data on *Foreign Visitors Growth* for tourism-based SDS economies, sourced from the UN Tourism Statistics Database, captures the significant fluctuations in international tourist arrivals, with an average growth rate of 1.93 percent and a high degree of variability. Furthermore, the **Production Function Potential GDP Growth**, derived from the Penn World Table inputs, closely follows the actual GDP growth at 2.57 percent, indicating on average limited economic slack. However, the negative **TFP Growth** (-0.06 percent) suggests that productivity improvements have been stagnant or even declining over the sample period.

Tourism-related infrastructure, as captured by the **Number of Rooms Growth** and **Number of Beds Growth** (sourced also from the UN Tourism Statistics Database), also displays substantial variability, reflecting differing levels of investment and expansion in the tourism sector across these countries. Some countries show significant expansions or contractions in their tourism infrastructure, likely due to either long-term investment cycles or specific events impacting tourism demand. The **Net Emigration Growth**, from the UN Global Imigration Database, points to additional challenges as many of these economies face outward migration pressures, which could further exacerbate labor shortages in the tourism industry. On the external balance side, the high variability in the **Current Account Deficit Growth**, measured as a share of GDP, highlights the difficulty these economies face in managing external imbalances, with tourism revenues acting as a critical buffer against trade deficits. Finally, **Foreign Direct Investment Growth**, sourced from IMF World Economic Outlook (WEO) and measured as a share of GDP, while positive at 0.04 percent, indicates that these economies may still face challenges in securing stable growth, long-term capital inflows needed to further develop the tourism sector and strengthen economic resilience. The variables **Investments, Services Balance, Remittances** are measured as a share of GDP. The fiscal-related metrics show that debt-to-GDP is declining, reflecting an increase in the tax base that grows at a faster pace than expenditures and GDP growth. However, these results should be interpreted with a grain of salt as the sample size for fiscal variables is significantly downsized relative to other metrics. The source of the data is the Fiscal Monitor 2024.

Table 2: Summary Statistics (1997-2023)

Statistic	N	Mean	St. Dev.	Min	Median	Max
Actual GDP Growth	603	2.64	5.63	−33.40	2.95	41.70
Foreigners Visitors Growth	603	1.93	52.50	−380.67	3.83	452.18
Production Function Potential GDP Growth	424	2.57	3.00	−4.36	2.01	17.44
TFP Growth	424	−0.06	1.61	−3.33	0.03	4.46
Capital Contribution to Growth	424	1.84	3.24	−7.69	1.42	20.12
Labor Contribution to Growth	424	0.87	0.67	−0.23	0.75	2.78
Production Function Output gap	438	−0.41	5.40	−32.24	−0.02	17.23
GDP Growth 5Y ahead (WEO)	497	3.20	1.47	−1	3	8
HP Potential GDP Growth	550	4.09	12.67	−148.37	4.14	123.37
Number of Rooms Growth	572	2.56	16.03	−161.11	0.78	172.34
Number o Beds Growth	537	2.12	14.97	−163.78	0.00	177.50
Investment Growth	419	3.27	9.38	−40.59	3.16	95.61
Net Emigration Growth	565	3.38	7.90	−30.54	2.56	23.60
Current Account Deficit Growth	392	6.63	84.70	−306.81	0.00	309.10
Services Balance Growth	280	8.49	47.13	−191.35	5.90	293.02
Remittances Growth	545	4.50	53.05	−566.09	2.96	638.27
Foreign Direct Investment Growth	328	4.04	89.74	−438.70	3.68	414.72
Revenues-to-GDP Growth	130	2.99	18.01	−57.82	2.74	46.72
Expentitures-to-GDP Growth	130	1.99	12.03	−20.00	0.14	42.83
Debt-to-GDP Growth	128	−3.69	16.34	−89.19	−6.11	73.92

Note: The unit of analysis is Tourism-based SDS economies follwing the definiton of International Monetary Fund (2024), covering 15 countries between 1997 and 2023. *Production Function* estimates are derived from Penn Word table inputs. *Foreigners Visitors*, *Number of Rooms and beds* and *Net Emigration* come from the UN database, while the WEO is the data source of the other variables.

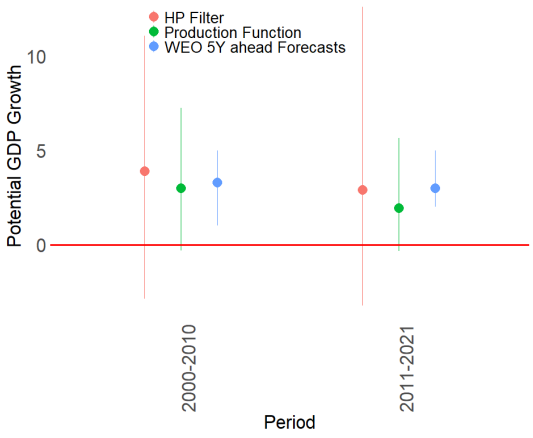
Potential Growth in Tourism-based SDS. Figure 2(a) depicts the Potential GDP Growth metrics for tourism-based SDS across three different methods: HP Filter, Production Function, and WEO 5-year ahead forecasts. For both periods (2000–2010 and 2011-2021), we see that potential growth estimates are relatively high, ranging from about 3 percent to nearly 8 percent depending on the method used, reflecting strong performance specially in the lead-up to the global financial crisis.

Growth and Potential Growth Comparisons with Peers. Figure 2(b) compares Actual GDP Growth with Production Function Potential GDP Growth across different country groupings: World, AEs, EMDEs, and tourism-based SDS. The chart reveals that while actual growth for AEs and EMDEs shows moderate variation between the two periods, the gap between actual and potential growth widens significantly for tourism-based SDS during 2011–2021. This divergence is chiefly explained by the cut-off in 2021, as tourism-dependent economies were still in the initial phase of COVID-19

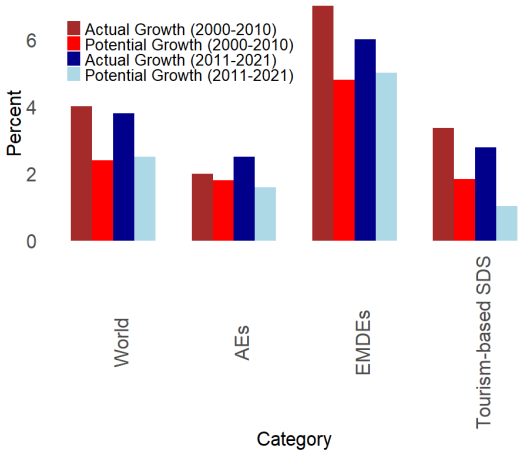
recovery.

Figure 2: Potential Growth Developments in Tourism-based SDS and Peers

(a) Potential GDP metrics in Tourism-based SDS



(b) GDP and Production Function Potential GDP



Source: Çelik et al. (2023) and Authors' own calculations

3.2 Short-term assessment of Tourism

Cabo Verde Islands sector and economic heterogeneity. To illustrate the economic heterogeneity across the islands, we provide a summary of key economic indicators for each island. The table 3 below highlights the distinct economic structures of each island. Tourism dominates the economies of Sal and Boa Vista, where high dependency aligns with elevated GDP per capita, reflecting the sector's profitability. In contrast, Santiago and São Vicente maintain more diversified economies, combining agriculture, government, and services with moderate tourism reliance. Meanwhile, islands like Fogo, Brava, Santo Antão, Maio, and São Nicolau remain rooted in agriculture and traditional industries, with lower tourism dependency and comparatively modest GDP per capita. This diversity underscores the islands' varying resilience to external shocks and highlights the role of geography in shaping economic structures.

Tourism Developments in Cabo Verde by island: an uneven recovery. Figure 3 illustrates the seasonally adjusted monthly visitors by island in Cabo Verde using the X-13 ARIMA method, providing a clear picture of the uneven recovery of tourism across the archipelago. While total tourism flows have rebounded strongly by 2022, surpassing pre-pandemic levels, this recovery has been largely driven by the exceptional performance of the tourism-centric islands of Sal and Boa Vista. Both islands exhibit a sharp recovery in visitor numbers, with Sal exceeding 60,000 monthly

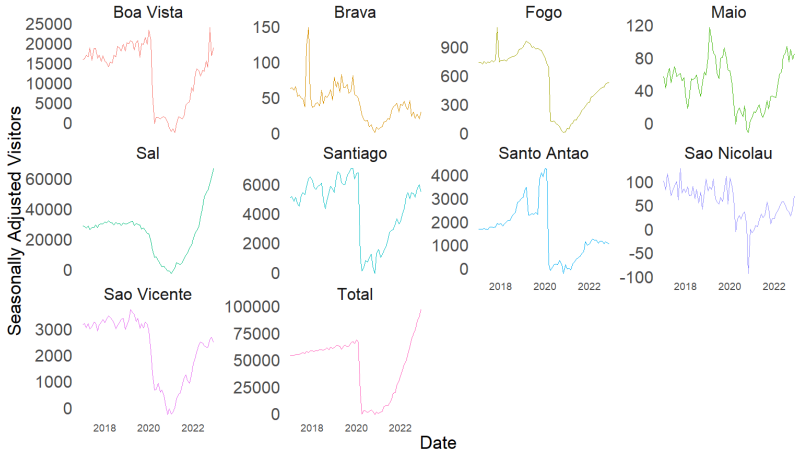
Table 3: Economic Indicators by Island in Cabo Verde

Island	Primary Economic Activity	Tourism Dependency	GDP per Capita (USD)
Santiago	Agriculture, Government	Moderate	5,341
Sal	Tourism	High	6,314
Boa Vista	Tourism	High	5,679
São Vicente	Fishing, Services	Moderate	6,407
Fogo	Agriculture, Wine Production	Low	3,410
Brava	Agriculture	Low	4,401
Santo Antão	Agriculture	Low	4,276
Maio	Agriculture, Tourism	Low	4,780
São Nicolau	Fishing, Agriculture	Low	4,806

Source: World Bank, Cabo Verde National Statistics Institute, 2023.

visitors and Boa Vista nearing 25,000, indicating a robust resurgence in tourist demand. However, the situation is different for the other islands. Islands such as Santiago, São Vicente, and Santo Antão, while showing some signs of recovery, have not yet returned to their pre-pandemic visitor levels. Moreover, smaller islands like Brava, Fogo, and Maio continue to experience very modest visitor flows, remaining well below pre-pandemic trends. This divergence highlights the heavy reliance of Cabo Verde's total tourism recovery on its key tourism hubs, with the rest of the archipelago still struggling to regain momentum in attracting tourists.

Figure 3: Seasonally Adjusted Monthly Foreigners Visitors by Island



Source: INE and Authors' own calculations

4 Empirical Strategy

Putting tourism-dependent SDS at the spotlight: transmission of a tourism shock to long and short-run output. First, from a potential growth angle, we use a production function approach to unpack how a recession or tourism shock links with labor, capital, and productivity (TFP) growth. Second, from a short-run GDP growth standpoint, we use the natural experiment of Cabo Verde to isolate the impact of a tourism-related shock on other sectors of the economy. We take advantage of the tourism heterogeneity of Cabo Verde's nine islands, of which two (Sal and Boa Vista) are highly tourism-dependent, receiving around 84 percent of tourists to the country in 2023, to estimate the overall short-run elasticity of tourism to growth (monthly island-level tax collection) and how the elasticity can be affected by the local dependency of the tourism sector.

4.1 Long-term impact of recessions and expansions

We employ a comprehensive econometric approach to analyze the relation of recessions and expansions on various dependent variables within tourism-dependent economies. By leveraging the Local Projection Method (LP), we systematically estimate the responses of key economic indicators such as capital, labor, and the Balance of Payments (BoP) to these shocks. The econometric model is designed to capture the dynamic effects of both adverse (recessions) and favorable (booms) shocks over different time horizons, allowing for a nuanced understanding of how these economies respond to varying external conditions. This approach provides robust evidence of the effects of tourism-driven fluctuations, highlighting the impact on economic activities from different angles.

To tailor our analysis to the unique characteristics of tourism-dependent SDS, we focused on specific metrics relevant to these economies. For capital variables, we concentrated on the supply side of the hotel industry, tracking indicators such as the number of rooms and beds, which are directly linked to the capacity of the tourism sector. On the labor side, we analyzed the influence on net emigration, a critical factor for many SDS where outward migration can significantly affect the labor market. For the BoP metrics, we mapped the impact on the balance of services, particularly focusing on tourism-derived revenues (balance of services) and remittances from the diaspora, both of which play a crucial role in the economic stability of these states. This tailored approach allows us to better capture the idiosyncrasies of tourism-dependent SDS.

Regarding the empirical strategy to estimate the relation of recessions and tourism cycles on potential growth, we apply the LP to estimate the impact of tourism shocks on potential and economic growth building on econometric specification from the work of Çelik et al. (2023). This method involves conducting a series of regressions on the dependent variable shifted several periods ahead. The LP offers a more flexible representation of Impulse Response Functions (IRFs), reducing susceptibility to potential inaccuracies typically associated with traditional Vector Autoregression (VAR) models, as noted by Auerbach and Gorodnichenko (2013) and Òscar Jordà and Taylor (2016). The

model estimates the effect of short-term shocks (tourism booms/bursts episodes) over a horizon h on potential growth and other variables while controlling for other determinants:

$$y_{i,t+h} - y_{i,t} = \alpha_h + \beta_h \text{shock}_{i,t} + \gamma_h \Delta y_{i,t-1} + \theta \text{natural\_disaster}_{i,t} + \text{fixed\_effects}_i + \epsilon_{i,t} \quad (1)$$

where $y_{i,t-1}$ is the natural logarithm of a metric of interest in levels before the recession and α_h is the intercept. The variable $\text{shock}_{i,t}$ is a dummy variable for a recession event, β_h denotes the impact on growth in each h year after the event shock, $\Delta y_{i,t-1}$ controls for the short-term trend of growth, and $\text{natural\_disaster}_{i,t}$ is a dummy variable controlling for the occurrence of a natural disaster using the international disaster database (EM-DAT). The model incorporates country-fixed effects to account for time-invariant differences across countries[4]. Compared to the specification in Çelik et al. (2023), our model introduces an additional independent variable, $\text{natural\_disaster}_{i,t}$, to isolate the impact of recessions and expansions driven by tourism fluctuations related to internal shocks[5]. Laeven and Valencia (2020) do not find any banking crisis overlapping with our sample, suggesting that internally originated shocks were primarily driven by natural disasters, including pandemic outbreaks.

Identification of shocks. For recessions, we use the same identification as Çelik et al. (2023). The authors defined a recession as a period from a peak in output preceding a business cycle trough to the trough, with a trough defined as a year in which output growth is both negative and at least one standard deviation below its long-term mean. For tourism bursts, we build on the work of Çelik et al. (2023) with adaptations to map tourism recessions. A tourism burst is defined as a period from a peak in tourism arrivals preceding a tourism cycle trough to trough. Conversely, a tourism boom is defined as a period from a trough in tourism arrivals preceding a tourism cycle peak to peak, with a peak defined as a year in which arrivals growth is both positive and at least one standard deviation above its long-term means.

We argue that the identified recessions and expansions in tourism-dependent SDS are intrinsically tied to fluctuations in tourism activity, given the outsized role that tourism plays in these economies. Tourism serves as a primary driver of economic growth in many SDS, making it highly plausible that downturns in tourist arrivals lead to broader economic contractions, while upswings generate expansions. To further bolster this argument, we explore alternative definitions of recessions in our robustness section.

[4] A dummy for time effects is unnecessary since the variable t represents the duration elapsed since the event's onset, varying across years for different countries. We set our baseline specification to benchmark our results against Çelik et al. (2023). However, our specification already accounts for global shocks indirectly through the inclusion of the recession and tourism shock variables. We also performed regressions with time-fixed effects, and the results are similar to the baseline but stronger

[5] Even after excluding this control, the results remain robust.

First, we adopt the baseline recession identification methodology from Çelik et al. (2023), as the period starting from a peak in output preceding a business cycle trough to the trough, with a trough defined as a year in which output growth is both negative and at least one standard deviation below its long-term mean. The baseline recession indentation yields 44 recessions episodes. Additionally, we use a modified version of the baseline using detrended GDP via HP filter instead of using actual GDP to compute the meand and standard deviation conditions. To highlight the external origins of tourist-driven recessions, we add a robustness check using real GDP growth of major advanced economies (G7), as reported in the IMF WEO, identifying global downturns that propagate to tourism-dependent economies. Second, we supplement the baseline (actual GDP) with an identification criterion that defines recessions specifically when tourism flows fall below their historical trend, yielding, thus, a narrower sample than the baseline of 40 episodes. Third, we extend the analysis by considering an additional identification, focusing on periods where tourism flows are running below the historical trend and defining a trough as a year in which output growth (actual GDP) is negative, dropping the assumption of at least one standard deviation below its long-term mean. As the trough definition was relaxed, we obtain a wider sample of 53 recession episodes.

Conversely, we define an expansion as the period starting from a trough in output and extending through to the next peak, with a peak defined as a year in which output growth is both positive and at least one standard deviation above its long-term mean. In this framework, the baseline identification of expansions includes 45 cases, mirroring the approach of Çelik et al. (2023) for recessions but focusing on growth momentum rather than contractions. Similarly to recessions, we use a modified baseline where detrended GDP (via HP filter) replaces actual GDP to compute mean and standard deviation conditions. To capture external drivers of tourism booms, we include a robustness check based on real GDP growth of major advanced economies. To provide a more nuanced perspective, we also consider expansions where tourism flows rise above their historical trend (actual GDP), narrowing the sample to 32 cases. Finally, we broaden the analysis to include expansions where tourism flows are above their trend without requiring output growth (actual GDP) to exceed a specific threshold, resulting in a wider sample of 60 expansion episodes.

4.2 Short-term Impact of Tourism

For the empirical strategy, the study used Cabo Verde as a Natural Experiment. Cabo Verde's unique geographic and economic characteristics provide an ideal setting to estimate the short-term link of tourism on economic activity. The archipelagic structure of nine islands, with limited inter-island connectivity, satisfies the Stable Unit Treatment Value Assumption (SUTVA), ensuring that tourism flows on one island do not spill over into others. Furthermore, the country's high openness to trade and its dependence on international imports rather than inter-island trade allow a clean isolation of tourism-driven economic disturbances, particularly on tourism-centric islands such as Sal and Boa Vista.

By focusing exclusively on Cabo Verde, our analysis achieves two significant advantages. First, the competitive dynamics of tourism among SDS often causes tourists to spill over borders, complicating efforts to isolate tourism shocks in cross-country panels. Second, while many SDS lack high-frequency data needed to capture short-term economic fluctuations, Cabo Verde provides robust high-frequency indicators, enabling a precise estimation of short-term dynamics. This controlled environment allows us to estimate the elasticity of tourism on economic activity more effectively than broader cross-country approaches.

In the baseline specification, we exclude the island of Santiago, where the capital Praia is located, to isolate the estimation from the heavy influence of the central government, which is disproportionate in SDS due to their lack of scale. This exclusion ensures a more focused assessment of tourism-driven economic activity. As a robustness check, we include Santiago in the baseline specification to verify whether the results remain consistent.

To examine the heterogeneous effects of tourism across regions, we specify a model that interacts tourism activity with a dummy variable distinguishing tourism-centric and non-tourism-centric islands. This approach isolates the differential impact of tourism shocks on regions with varying levels of tourism dependency:

$$\begin{aligned} y_{i,t+h} = \alpha_i^h + \tau_t^h + \sum_{p=0}^{P} \rho_p^h y_{i,t-p} + \sum_{p=0}^{P} \delta_p^h \, \text{tourism}_{i,t-p} \\ + \text{non-centric}_i \times \left(\sum_{p=0}^{P} \gamma_p^h \, \text{tourism}_{i,t-p} \right) + \epsilon_{i,t+h} \end{aligned} \tag{2}$$

Here, $y_{i,t+h}$ represents the economic activity in island i, measured as log-transformed and seasonally adjusted VAT collections, with $\text{tourism}_{i,t-p}$ capturing lagged log-transformed foreign arrivals. Island-fixed effects (α_i^h) control for idiosyncratic trends specific to each island, while year-time fixed effects (τ_t^h) account for common shocks across all islands. Standard errors are clustered at the island level. The term non-centric_i dummy differentiates the impact on non-tourism-centric islands, and the interaction term allows us to assess the heterogeneous effects of tourism activity. The parameter $\delta_0^h + \gamma_0^h$ represents the immediate impact of tourism shocks on non-tourism-centric islands.

Finally, we evaluate whether tourism serves as a significant driver of economic growth in non-tourism-centric islands by introducing a specification that controls for both direct and indirect tourism effects. This allows us to estimate the spillover influence from tourism-centric islands on non-tourism-centric regions:

$$
\begin{aligned}
y_{\text{non-centric},t+h} = \alpha_i^h + \tau_t^h + \sum_{p=0}^{P} \rho_p^h y_{\text{non-centric},t-p} + \sum_{p=0}^{P} \delta_p^h \, \text{tourism}_{\text{non-centric},t-p} \\
+ \left(\sum_{p=0}^{P} \beta_p^h \, \text{tourism}_{\text{centric},t-p} \right) + \epsilon_{\text{non-centric},t+h}
\end{aligned}
\tag{3}
$$

To test the robustness of our findings, we performed additional exercises to compare short-run elasticities estimated in Equations (2) and (3) across the pre- and post-COVID-19 periods (January 2017–March 2020 vs. April 2020–December 2022). This ensures that our results remain consistent despite the unprecedented disruptions caused by the pandemic.

To address potential omitted variable bias and reinforce the robustness of our findings, we implement an instrumental variable (IV) estimation as an additional robustness check. Using AR (3) residuals of monthly arrivals from foreigners at the island level as instruments for lagged tourism shocks, this approach helps mitigate endogeneity concerns arising from unobserved confounders.

5 Results

5.1 Long-term relation of recessions and expansions

Resilience of SDS to Recessions. Figure 4[6] illustrates that tourism-dependent SDS experience temporary reductions in potential growth during recessions, largely attributed to a contraction in capital. In contrast, Emerging Market and Developing Economies (EMDEs) face more permanent declines, driven by sustained reductions in investment, employment, and potential growth in TFP. This result is noteworthy, given that recessions in tourism-dependent SDS tend to be deeper on average than in EMDEs. Research by Mu et al. (2023) suggests that the economic cycles of AEs, which are the main source of tourism for most SDS, play a critical role in influencing these dynamics. The relatively milder economic cycles in the AEs may help explain why tourism-dependent SDS recover more quickly after recessions. These observations remain robust even when the COVID-19 period, characterized by sharp declines and rapid recoveries in tourism activity, is excluded from the analysis. Interestingly, the right panel of Figure 4 indicates that expansions in tourism-dependent SDS lead to a delayed and muted response to potential growth, primarily driven by gains in employment and investment growth.

Capital. Figure 5 highlights the dual influence of economic cycles on capital-related metrics in tourism-dependent SDS, with particular attention to the hotel industry. During recessions, hotel

[6]The Annex details the underlying mid-point estimates and standard deviations of the baseline regressions and robustness tests.

supply metrics, including the number of rooms and beds available, decline sharply but begin to recover over time. However, broader investment metrics show a more prolonged contraction, reflecting a delayed recovery in capital accumulation outside the tourism sector. This divergence suggests that while the tourism sector adapts relatively quickly to changes in demand, broader investment activity faces more persistent constraints during economic downturns. In contrast, during expansions, investment growth in tourism-dependent SDS initially surges, driven by increased activity in the tourism sector, as evidenced by the rapid expansion of hotel capacity. However, this momentum tends to fade, suggesting limited spillover effects in broader investment opportunities.

Labor. Figure 6 demonstrates the relation of economic cycles on employment and labor productivity in tourism-dependent SDS. During recessions, employment contracts sharply, particularly in tourism-related sectors such as hospitality and services. The decline in economic activity and the increase in uncertainty also result in reduced labor efficiency. Net emigration growth slows significantly during these periods, likely due to fewer opportunities abroad, exacerbating local labor market pressures as competition for limited jobs intensifies. In contrast, during expansions, the labor markets in SDS exhibit notable recoveries. Employment growth rebounds alongside a resurgence in tourism activity, particularly in service-oriented sectors. However, net emigration growth accelerates during expansions, potentially reflecting improved opportunities globally as economic conditions stabilize.

Balance of Payments. Figure 7 provides an overview of how recessions and expansions affect external economic stability in tourism-dependent SDS. These economies often face persistent trade deficits due to their reliance on imports for both consumption and investment goods, which is offset, to some extent, by a positive services balance driven by tourism receipts.

During recessions, the current account deficit (CAD) increases significantly, driven by sharp declines in tourism inflows, deteriorating the balance of services and amplifying the trade deficit. This underscores the central role of tourism as a stabilizing factor for external balances. In addition, remittances, a critical source of foreign income for SDS, also decline during recessions, further straining the balance of payments.

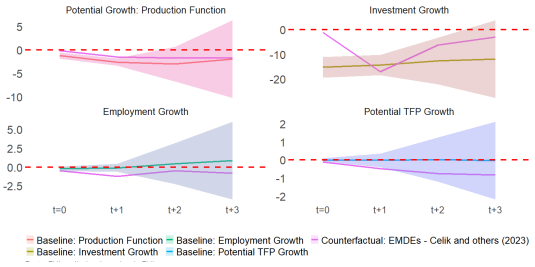
However, expansions do not produce significant improvements in CAD. While tourism inflows recover, the gains are offset by rising imports needed to support the expanding tourism sector. Furthermore, foreign direct investment (FDI) shows only limited recovery during expansions, reflecting persistent structural challenges in attracting sustained external capital. These findings suggest that expansions in SDS may not substantially enhance external stability due to their high import dependence and limited diversification of foreign income sources.

Fiscal. Figure 8 illustrates the relation of economic cycles on fiscal metrics in tourism-dependent SDS, focusing on countercyclical expenditure patterns and the dynamics of public debt growth. During recessions, government spending increases relative to GDP as a stabilizing measure, but the

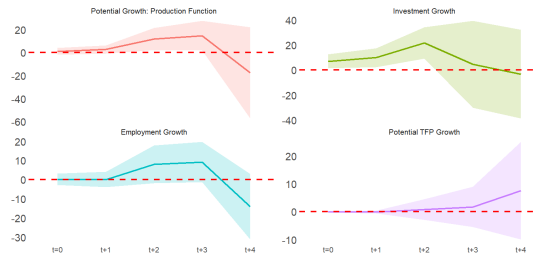
accompanying sharp GDP contraction leads to a significant rise in the public debt-to-GDP ratio. In expansions, expenditure growth slows relative to GDP, but revenue-to-GDP ratios do not improve sufficiently to rebuild fiscal buffers. This reflects a missed opportunity to improve fiscal resilience and reduce public debt during periods of economic growth.

Figure 4: Impact of Recessions and Expansions on Potential Growth

(a) Impact of a Recession on Potential Growth



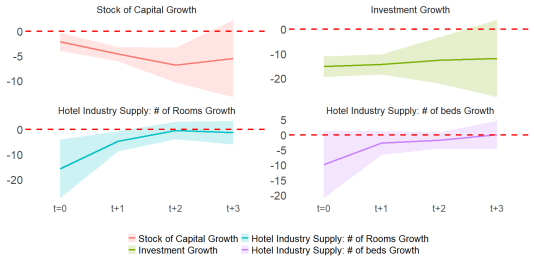
(b) Impact of an Expansion on Potential Growth



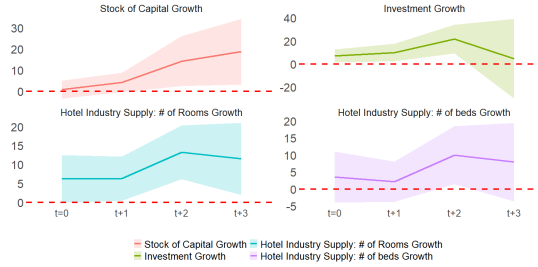
Source: IMF and Authors' own calculations. Note: The shaded area represents a 90 percent confidence interval.

Figure 5: Impact of Recessions and Expansions on Capital-related Metrics (Percent)

(a) Impact of a Recession on Capital-related Metrics



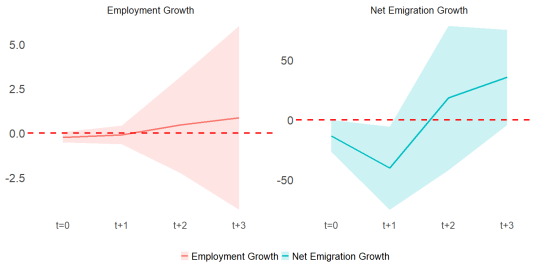
(b) Impact of an Expansion on Capital-related Metrics



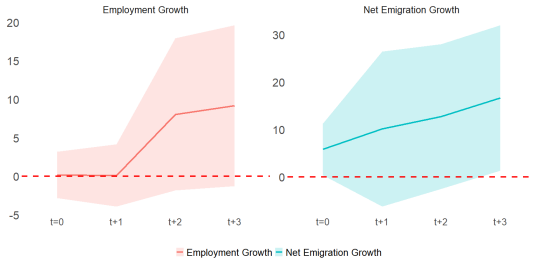
Source: IMF and Authors' own calculations. Note: The shaded area represents a 90 percent confidence interval.

Figure 6: Impact of Recessions and Expansions on Labor-related Metrics (Percent)

(a) Impact of a Recession on labor-related Metrics



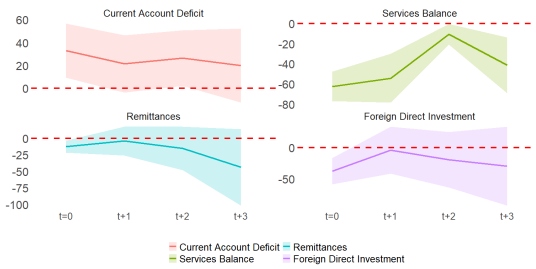
(b) Impact of an Expansion on Labor-related Metrics



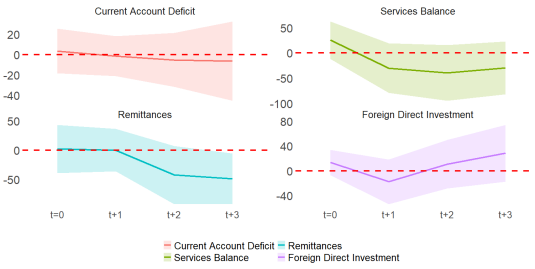
Source: IMF and Authors' own calculations. Note: The shaded area represents a 90 percent confidence interval.

Figure 7: Impact of Recessions and Expansions on BoP-related Metrics (Percent)

(a) Impact of a Recession on BoP-related Metrics



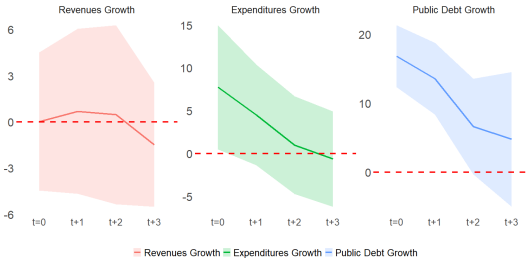
(b) Impact of an Expansion on BoP-related Metrics



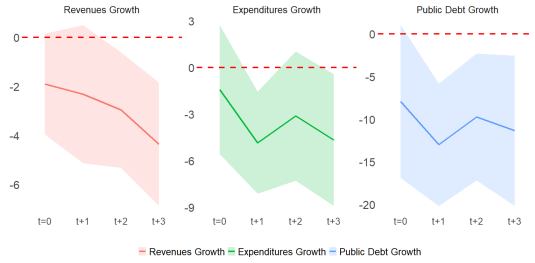
Source: IMF and Authors' own calculations. Note: The shaded area represents a 90 percent confidence interval.

Figure 8: Impact of Recessions and Expansions on Fiscal-related Metrics (Percent)

(a) Impact of a Recession on Fiscal-related Metrics



(b) Impact of an Expansion on Fiscal-related Metrics



Source: IMF and Authors' own calculations. Note: The shaded area represents a 90 percent confidence interval.

5.2 Short-term Influence of Tourism

Figure 9 unpacks the differencital influence between tourism-centric and non-tourism-centric islands. The left panel shows that tourism-centric islands, such as Sal and Boa Vista, experience a strong and immediate increase in VAT collections, reflecting the crucial role of tourism in driving local economic activity pointing to mid-point eslaticity over 12 months around 0.4. Conversely, the right panel illustrates a muted response in non-tourism-centric islands, with economic activity even declining in some cases. This suggests that these regions may face more indirect or negative effects, such as competition for resources and rising prices, without significant direct gains from tourism.

Most notably, the differential influence between tourism-centric and non-tourism-centric islands is statistically significant, reinforcing the asymmetric economic response to tourism shocks. Tourism-dependent islands experience robust growth, while non-tourism-centric regions are more insulated or negatively affected by fluctuations in tourist inflows.

The results of Equation (3), in turn, examine the direct and indirect links of tourism on non-tourism-centric islands. The left panel of Figure 10 shows the direct impact of local tourism on VAT collections in non-tourism-centric islands, with a modest, short-term increase that becomes statistically insignificant over time. This indicates that local tourism alone does not drive VAT revenues in these regions in the long term. The right panel reflects the indirect impact of tourism in tourism-centric islands on non-centric regions, which is similarly insignificant. This suggests that economic activity in Sal and Boa Vista remains largely disconnected from the economic performance of other islands in the short term.

To inform the policy discussion, we decompose the national elasticity of economic activity to tourist arrivals, denoted by Θ, into local-level elasticities across tourism-centric and non-tourism-centric

islands. Specifically, the national elasticity can be expressed as a weighted average of the local elasticities:

$$\Theta = \Psi \cdot \omega_{\text{centric}} + \eta \cdot \omega_{\text{noncentric}}, \tag{4}$$

where Ψ denotes the elasticity of GDP to arrivals in tourism-centric islands, and η the corresponding elasticity in non-tourism-centric islands. The weights ω_{centric} and $\omega_{\text{noncentric}}$ represent the respective shares of national GDP originating from each group of islands.

To calibrate these weights, we use pre-pandemic (2019) island-level GDP data from INE, excluding Santiago Island to account for the distorting role of the public sector in that region. This yields estimates of $\omega_{\text{noncentric}} \approx 0.6$ and $\omega_{\text{centric}} \approx 0.4$, which provide a conservative (lower-bound) estimate when used to back out implied national elasticities.[7]

Furthermore, we use Equation (4) to estimate the elasticity of economic activity in tourism-centric islands to arrivals, denoted by $\Psi \approx 0.4$, and the corresponding elasticity in non-tourism-centric islands, $\eta \approx 0$. Based on these estimates and the calibrated GDP shares ($\omega_{\text{centric}} \approx 0.4$ and $\omega_{\text{noncentric}} \approx 0.6$), we compute the aggregate national elasticity to arrivals as $\Theta \approx 0.16$.

Under a downside scenario, a hypothetical 20 percent decline in tourist arrivals to the tourism-centric islands would result in a contraction of national GDP of approximately 3.2 percent, all else equal. This contraction, in turn, would mechanically increase the debt-to-GDP ratio due to the denominator effect. Based on the calibration below, such a shock would imply a rise in the debt ratio of about 3.6 percentage points of GDP.[8].

Under an upside scenario, we consider the case of improved inter-island connectivity, where the elasticity of economic activity in non-tourism-centric islands to tourist arrivals increases from zero to $\eta = 0.4$—the same value as that estimated for tourism-centric islands. This assumption is plausible, as tourism in resort-centric islands is often capital intensive and enclave-based, while tourism in non-centric islands tends to be more labor intensive, community-driven, and reliant on smaller-scale hotel infrastructure, thus fostering greater local economic linkages.

[7] Using average annual growth rates of real GDP and international arrivals over the period 1996–2024, we estimate a national point elasticity $\Theta \approx 0.18$, which in turn implies weights of approximately $\omega_{\text{noncentric}} \approx 0.54$ and $\omega_{\text{centric}} \approx 0.46$.

[8] The isolated impact of nominal GDP growth on the debt-to-GDP ratio is given by the following expression:

$$\text{Growth effect} = -\frac{g_t}{1+g_t} \cdot \frac{D_{t-1}}{Y_{t-1}}, \tag{5}$$

where $g_t = -0.032$ corresponds to the GDP contraction from a 20% drop in arrivals (given $\Theta = 0.16$), and $\frac{D_{t-1}}{Y_{t-1}} = 1.1$.

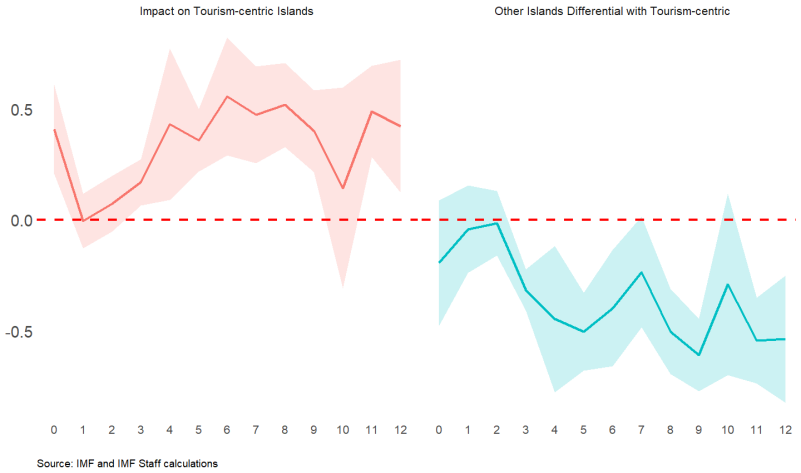
At baseline, with $\Psi = 0.4$, $\eta = 0$, $\omega_{\text{centric}} = 0.4$, and $\omega_{\text{noncentric}} = 0.6$, the national elasticity is $\Theta = 0.16$, implying that a 20 percent increase in tourist arrivals would raise national GDP by approximately 3.2 percent.

In the upside scenario, with both local elasticities equal to 0.4, the national elasticity becomes:

$$\Theta^{\text{up}} = \Psi \cdot \omega_{\text{centric}} + \eta \cdot \omega_{\text{noncentric}} = 0.4 \cdot 0.4 + 0.4 \cdot 0.6 = 0.4,$$

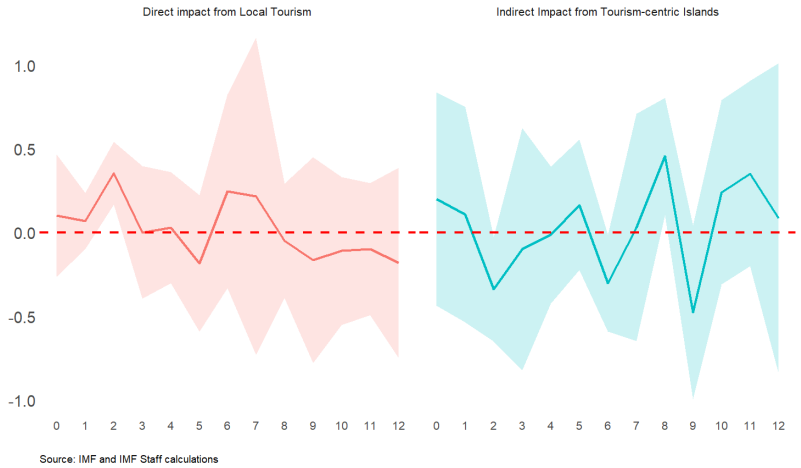
which implies that a 20 percent increase in arrivals would lead to an 8.0 percent increase in national GDP—more than double the baseline effect. This illustrates the potential macroeconomic benefits of policies aimed at integrating less-tourism-intensive regions into the broader tourism value chain.

Figure 9: Impact of 1 Percent increase in Tourism flows on Domestic VAT (Percent) by Tourism Dependency



Source: IMF and Authors' own calculations. Note: The shaded area represents a 90 percent confidence interval.

Figure 10: Impact of 1 Percent increase in Tourism flows on Domestic VAT (Percent) in non-centric Islands



Source: IMF and Authors' own calculations. Note: The shaded area represents a 90 percent confidence interval.

6 Robustness

6.1 Long-term and short-term relation of recessions and expansions

We argue that the identified recessions and expansions in tourism-dependent SDS are intrinsically tied to fluctuations in tourism activity, given the enormous role that tourism plays in these economies. Tourism serves as a primary driver of economic growth in many SDSs, which makes it highly plausible that downturns in tourist arrivals lead to broader economic contractions, while upswings generate expansions. To further substantiate this argument, we conduct two alternative analyses: (i) applying the methodology to three subgroups of SDS countries (Sub-Saharan Africa (SSA), the Caribbean, and Asia); and (ii) modifying the specifications of recessions along with introducing two additional definitions of expansions in our robustness section.

The influence of economic fluctuations on three subgroups of SDS countries is broadly in line with the expanded sample in terms of potential growth, capital, labor, external factors, and fiscal metrics. It is worth mentioning that the country samples for Sub-Saharan Africa (SSA) and Asia are limited, and there are few differences in the results of the subgroups compared to the overall assessment. In SSA, net emigration became significant during both expansions and recessions, while higher remittances were observed during recessions, along with additional foreign direct investment (FDI) inflows occurring during expansions. For Caribbean countries, a persistent higher level of debt is

associated with occurrence of recessions. In the case of Asian SDS countries, there is a notable and persistent decline in potential growth following a recession. The complete set of robustness charts and accompanying tables can be found in Annex B.

To assess the implications of different specifications for recessions and expansions, the study departs from the baseline recession identification from Çelik et al. (2023), which yields 44 recession episodes, we refine the identification to consider only recessions where tourism flows fall below their historical trend, resulting in a narrower sample of 40 episodes. Table 5 in Annex B shows the results for this specification using detrended GDP which are in line with the baseline. Table 6 in Annex B shows that the identification of the recession based on the growth of major AEs produces results similar to our baseline. Second, we relax the definition of the trough by dropping the requirement of a standard deviation below the mean and focusing solely on negative output growth, expanding the sample to 53 recession episodes.

In contrast, first expansions are defined as periods starting from a trough and extending to the next peak, where a peak is characterized by positive output growth at least one standard deviation above the long-term mean. This baseline yields 45 expansion episodes. Annex B also presents the results using detrended GDP, which remain consistent with the baseline findings, and confirms that expansions identification using major AEs' growth yields results consistent with our baseline. Second, we test a narrower definition in which expansions occur when tourism flows rise above their historical trend, narrowing the sample to 32 cases. Third, we expand the definition by including expansions where tourism flows exceed their trend without requiring output growth to exceed a specific threshold, resulting in a wider sample of 60 expansion episodes.

When employing a narrow and broad definition of recessions and expansions, the robustness results are broadly in line with the baseline, with some deviations. Under both definitions, the influence of recessions on potential growth, capital-related metrics, labor, Balance of Payments, and fiscal indicators are broadly aligned with baseline. Under the narrow definition, expansions produce muted gains in potential growth and capital accumulation. This conservative specification highlights that the recovery in tourism activity has limited spillover effects to broader economic metrics, consistent with the baseline findings. However, we see that net emigration decreases after an expansion diverging from the baseline outcome, signaling that the improvement in the local market more than offset the outflows driven by stronger economic conditions in AEs. The limited rebound in fiscal metrics suggests a continued challenge in using periods of growth to effectively rebuild fiscal buffers. The full set of robustness charts and underlying tables is also presented in Annex B.

6.2 Short-term Influence of Tourism

The analysis further illustrates the divergence between pre- and post-pandemic impacts by tourism dependency. Before the pandemic, the results align with the baseline, showing a strong positive

response in tourism-centric islands and a negative differential in non-tourism-centric islands. After the pandemic, however, the response in tourism-centric islands becomes more subdued compared to the baseline, similar to the negative differential in non-tourism-centric regions. This indicates that the recovery from the pandemic may have amplified the asymmetry between these regions, with non-tourism-centric islands experiencing greater disruptions and reduced benefits from tourism. Although our baseline specification focuses on the dynamic relationship between tourist arrivals and local economic activity, rather than an event-study framework, we include a robustness check using a difference-in-differences set-up. In this specification, Sal and Boa Vista serve as treated units and the onset of COVID (March 2020) as the event. Without violating the parallel trend condition, the results confirm that tourism-centric islands experienced a significantly sharper contraction.

We also include an analysis of Santiago Island, where the capital Praia is located, demonstrating that the influence of government-related economic activity does not substantially alter the estimated results. This suggests that the findings are not overly sensitive to the inclusion of regions with distinct economic performance. In addition, we employ an instrumental variable (IV) approach. With high first-stage F-statistics across all regression horizons, the IV estimation confirms the validity of the instrument and provides evidence that the estimated relations are not driven by endogeneity or omitted variable bias. The full set of supporting charts and tables for this section is presented in Annex C.

7 Conclusion

Our study uncovers two critical findings. First, the long-term influence of recessions are less persistent in SDS than in larger emerging markets, primarily because tourism-dependent economies tend to recover more quickly with the rebound in international travel. Second, we estimate that the short-run elasticity of tourism to economic growth in Cabo Verde is around 0.4 over twelve months, which can be considered a lower bound for other SDS due to the limited spillover effects from tourism to other economic sectors. This is supported by the negligible impact of tourism shocks on non-tourism-centric islands, highlighting the constrained benefits of tourism growth across different regions and sectors within an SDS. The observed resilience, particularly in Cabo Verde, suggests that tourism can serve as a robust recovery mechanism. However, challenges such as sectoral diversification, economic integration, and inclusivity remain and need to be addressed to ensure sustainable growth and lower vulnerabilities.

Importantly, the analysis of asymmetric scenarios in Cabo Verde reveals that a 20 percent decline in arrivals concentrated in tourism-centric islands could lead to a contraction in national GDP of over 3 percent and a mechanical increase in public debt of approximately 3.6 percentage points of GDP. Conversely, under a scenario of improved inter-island connectivity—where non-centric regions become more integrated into the tourism economy—the same increase in arrivals could raise GDP

by up to 8 percent, more than double the baseline effect.

In terms of policy recommendations, the resilience of trend growth in tourism-dependent economies underscores the sector's potential as a robust recovery mechanism in the aftermath of recessions, with relatively faster recoveries compared to larger emerging markets. However, the limited spillover effects of tourism on other sectors and regions within SDS highlight the need for strategic interventions to foster diversification and sectorial integration by strengthening linkages between tourism and non-tourism sectors to ensure broader, more equitable growth.

Although tourism can indeed serve as an effective growth driver with a strong recovery trend, relying excessively on this sector alone could expose economies to significant volatility and external shocks. Given the empirical evidence demonstrating the adaptability of the tourism sector to fluctuations in business cycles, policymakers should implement temporary measures to mitigate the adverse effects on economic activity during downturns. This approach should particularly focus on supporting other sectors.

Key strategies may include establishing an effective unemployment security scheme, ensuring access to credit for businesses—potentially through the design of a public guarantee policy if necessary—and providing targeted social transfers to the most vulnerable populations. In terms of fiscal policy, it is essential to maintain a prudent level of indebtedness and to implement fiscal consolidation measures during periods of economic expansion. This strategy will help create fiscal buffers that allow for increased spending during economic downturns. Additionally, regarding the external sector, authorities should aim to reduce Balance of Payments exposure to shocks from food and energy prices by promoting economic diversification and facilitating the transition to renewable energy. It is also crucial to identify and maintain an adequate level of international reserves that can effectively respond to temporary external shocks. By implementing these measures, policymakers can enhance economic resilience and better prepare for unforeseen challenges in the tourism sector.

This study provides valuable insights into the relationship of recessions and tourism shocks on SDS, it is not without limitations. The analysis is constrained by the availability and quality of data, particularly concerning potential growth metrics. Future research could benefit from more granular data, especially at the sectoral level, to refine the estimates provided here. Additionally, the results may not be directly generalizable to other small states or non-tourism-dependent economies. The unique characteristics of SDS, such as their reliance on tourism and external aid, mean that the findings may not apply to countries with different economic structures. Future research could explore the applicability of these findings to other small states, as well as the potential for cross-country comparisons to identify best practices in managing economic shocks. Finally, future research could analyze heterogeneity by income level or fragility status within tourism-dependent SDS.

Annex

The annex complements the main text by providing detailed supporting evidence. Annex A lists the country groups used in the empirical analysis. Annex B presents robustness checks on the long-term relations of tourism booms and busts across different regions (Sub-Saharan Africa, the Caribbean, and Asia) and economic channels (growth, capital, labor, BoP, and fiscal metrics), including results under alternative identification strategies. Annex C focuses on the short-term effects of tourism shocks in Cabo Verde, using baseline and IV specifications to show how local fiscal outcomes vary with tourism dependency before and after the pandemic (Local projections and Diff-and-Diff).

Annex A: Country Groups in the Data Analysis

Table 4: Countries Included in Each Economic Group

Economic Group	**Countries**
Advanced Economies	Andorra, Australia, Austria, Belgium, Canada, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hong Kong SAR, Iceland, Ireland, Israel, Italy, Japan, Korea, Latvia, Lithuania, Luxembourg, Macao SAR, Malta, Netherlands, New Zealand, Norway, Poland, Portugal, Puerto Rico, San Marino, Singapore, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Taiwan Province of China, United Kingdom, United States
Emerging Market Economies	Albania, Algeria, Angola, Argentina, Armenia, Aruba, Azerbaijan, Bahrain, Belarus, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Brunei Darussalam, Bulgaria, Chile, China, Colombia, Costa Rica, Dominican Republic, Ecuador, Egypt, El Salvador, Eswatini, Gabon, Georgia, Guatemala, Hungary, India, Indonesia, Iran, Iraq, Jamaica, Jordan, Kazakhstan, Kosovo, Kuwait, Lebanon, Libya, Malaysia, Mexico, Mongolia, Morocco, Namibia, North Macedonia, Oman, Pakistan, Panama, Paraguay, Peru, Philippines, Qatar, Romania, Russia, Saudi Arabia, Serbia, South Africa, Sri Lanka, Syria, Tajikistan, Thailand, Tunisia, Turkmenistan, Ukraine, United Arab Emirates, Uruguay, West Bank and Gaza
Low-Income Developing Countries	Afghanistan, Bangladesh, Benin, Burkina Faso, Burundi, Cambodia, Cameroon, Central African Republic, Chad, Democratic Republic of the Congo, Republic of the Congo, Côte d'Ivoire, Equatorial Guinea, Eritrea, Ethiopia, Gambia, Ghana, Guinea, Guinea-Bissau, Haiti, Honduras, Kenya, Kyrgyz Republic, Lao P.D.R., Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Moldova, Mozambique, Myanmar, Nepal, Nicaragua, Niger, Nigeria, Papua New Guinea, Rwanda, Senegal, Sierra Leone, Somalia, South Sudan, Sudan, Tanzania, Timor-Leste, Togo, Türkiye, Uganda, Uzbekistan, Vietnam, Yemen, Zambia, Zimbabwe
Non-Tourism-based SDS	Bhutan, Comoros, Djibouti, Guyana, Kiribati, Marshall Islands, Micronesia, Nauru, Solomon Islands, Suriname, Tonga, Trinidad and Tobago, Tuvalu
Tourism-based SDS	Antigua and Barbuda, Bahamas, Barbados, Cabo Verde, Dominica, Fiji, Grenada, Maldives, Mauritius, Samoa, Seychelles, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Vanuatu

Annex B: Long-term relation of tourism on growth

Figure 11: Sub-Saharan Africa: relation between Recessions/Expansions and Potential Growth

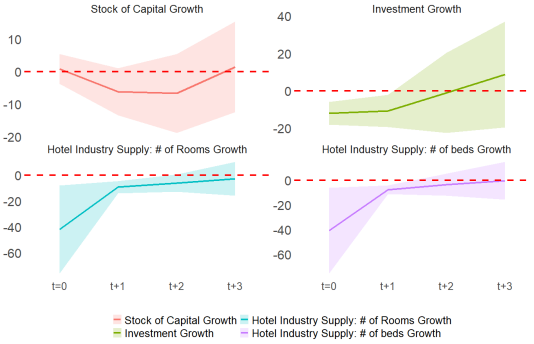
(a) Relation between Recessions and Potential Growth

(b) Relation between Expansions and Potential Growth

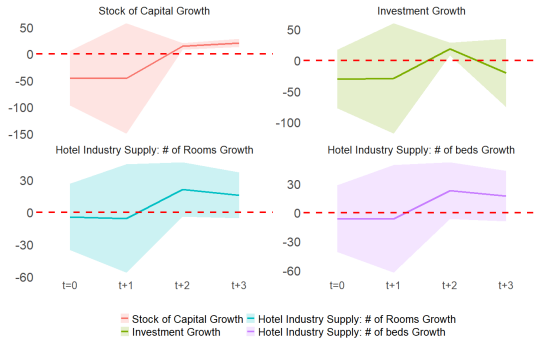
Source: IMF and Authors' own calculations

Figure 12: Sub-Saharan Africa: relation between Recessions/Expansions and Capital-related Metrics (Percent)

(a) Relation between Recessions and Capital-related Metric



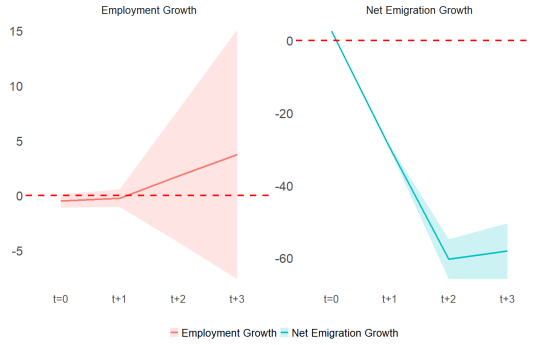
(b) Relation between Expansions and Capital-related Metrics



Source: IMF and Authors' own calculations

Figure 13: Sub-Saharan Africa: relation between Recessions/Expansions and Labor-related Metrics (Percent)

(a) Relation between Recessions and labor-related Metrics

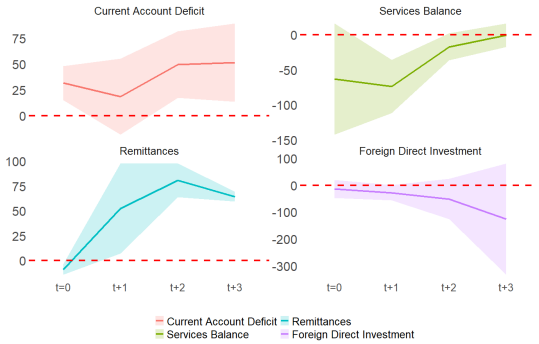


(b) Relation between Expansions and Labor-related Metrics

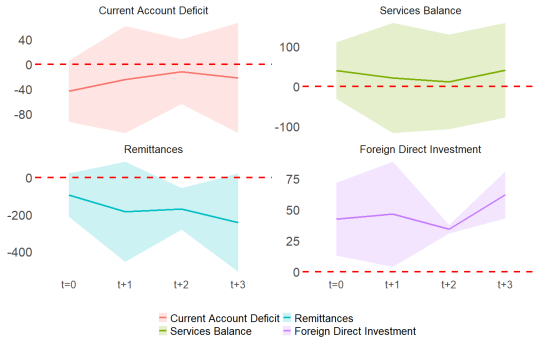
Source: IMF and Authors' own calculations

Figure 14: Sub-Saharan Africa: relation between Recessions/Expansions and BoP-related Metrics (Percent)

(a) Relation between Recessions and BoP-related Metrics



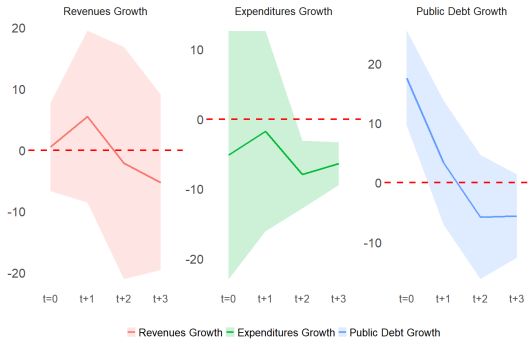
(b) Relation between Expansions and BoP-related Metrics



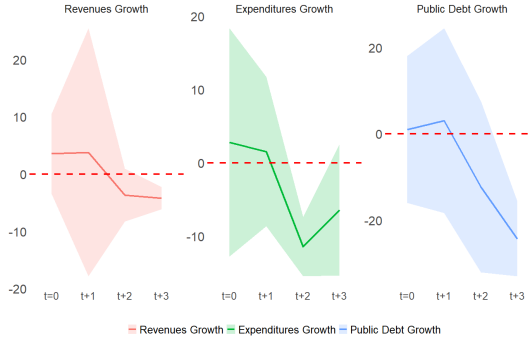
Source: IMF and Authors' own calculations

Figure 15: Sub-Saharan Africa: relation between Recessions/Expansions and Fiscal-related Metrics (Percent)

(a) Relation between Recessions and Fiscal-related Metrics



(b) Relation between Expansions and Fiscal-related Metrics



Source: IMF and Authors' own calculations

Figure 16: Caribbean: relation between Recessions/Expansions and Potential Growth

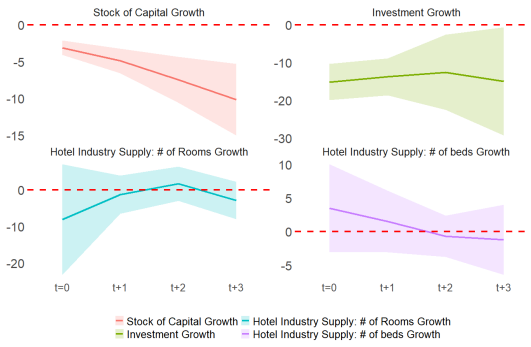
(a) Relation between Recessions and Potential Growth

(b) Relation between Expansions and Potential Growth

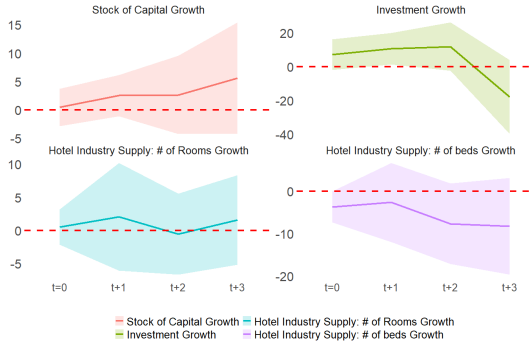
Source: IMF and Authors' own calculations

Figure 17: Caribbean: relation between Recessions/Expansions and Capital-related Metrics (Percent)

(a) Relation between Recessions and Capital-related Metric



(b) Relation between Expansions and Capital-related Metrics



Source: IMF and Authors' own calculations

Figure 18: Caribbean: relation between Recessions/Expansions and Labor-related Metrics (Percent)

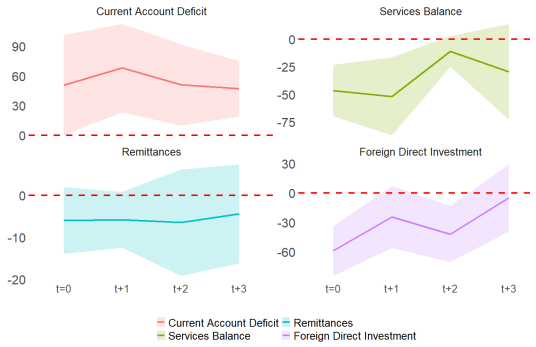
(a) Relation between Recessions and labor-related Metrics

(b) Relation between Expansions and Labor-related Metrics

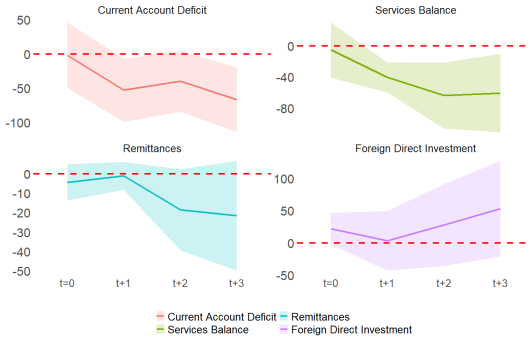
Source: IMF and Authors' own calculations

Figure 19: Caribbean: relation between Recessions/Expansions and BoP-related Metrics (Percent)

(a) Relation between Recessions and BoP-related Metrics



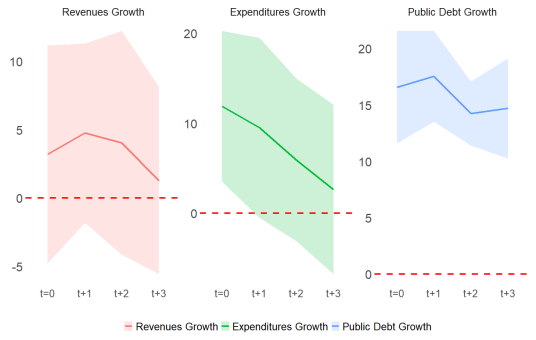
(b) Relation between Expansions and BoP-related Metrics



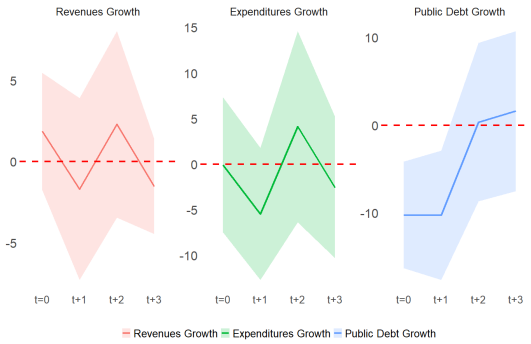
Source: IMF and Authors' own calculations

Figure 20: Caribbean: relation between Recessions/Expansions and Fiscal-related Metrics (Percent)

(a) Relation between Recessions and Fiscal-related Metrics



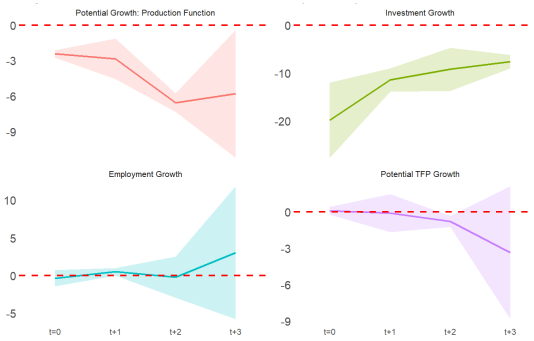
(b) Relation between Expansions and Fiscal-related Metrics



Source: IMF and Authors' own calculations

Figure 21: Asia: relationship between Recessions/Expansions and Potential Growth

(a) Relationship between Recessions and Potential Growth

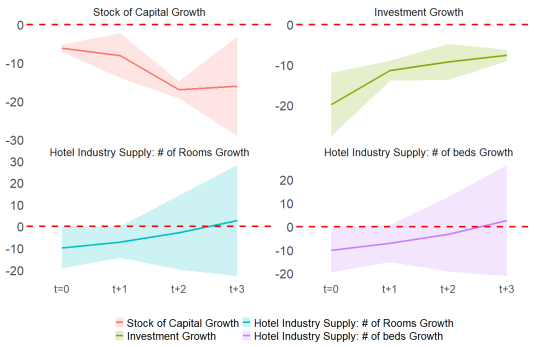


(b) Relationship between Expansions and Potential Growth

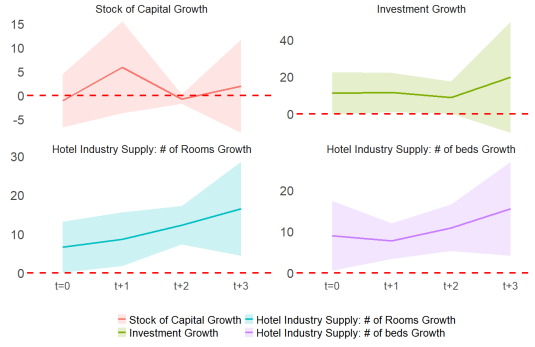
Source: IMF and Authors' own calculations

Figure 22: Asia: relationship between Recessions/Expansions and Capital-related Metrics (Percent)

(a) Relationship between Recessions and Capital-related Metric



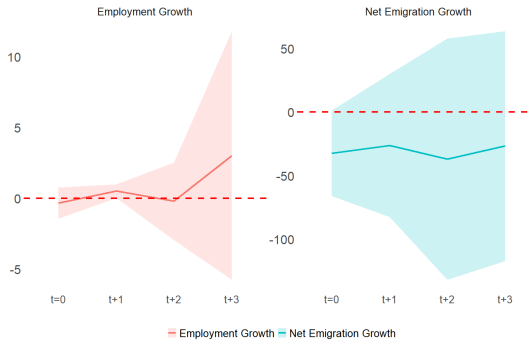
(b) Relationship between Expansions and Capital-related Metrics



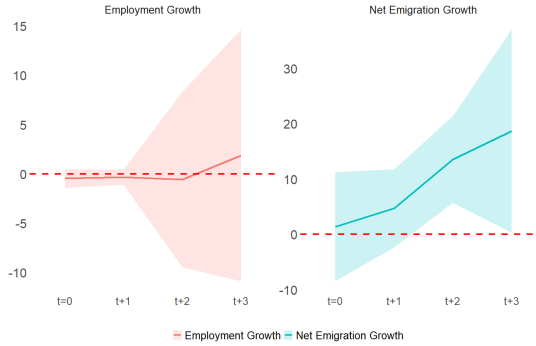
Source: IMF and Authors' own calculations

Figure 23: Asia: relationship between Recessions/Expansions and Labor-related Metrics (Percent)

(a) Relationship between Recessions and labor-related Metrics



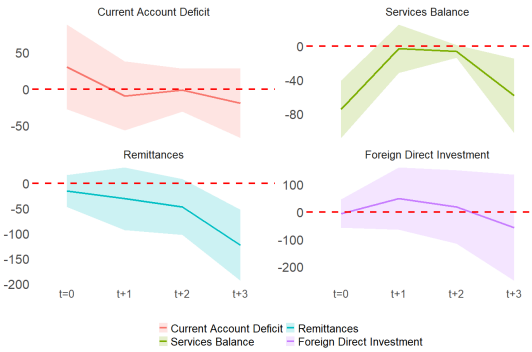
(b) Relationship between Expansions and Labor-related Metrics



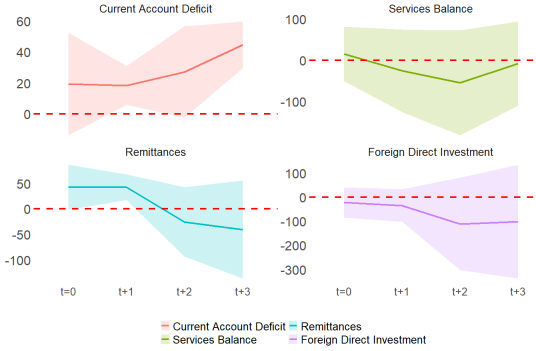
Source: IMF and Authors' own calculations

Figure 24: Asia: relationship between Recessions/Expansions and BoP-related Metrics (Percent)

(a) Relationship between Recessions and BoP-related Metrics



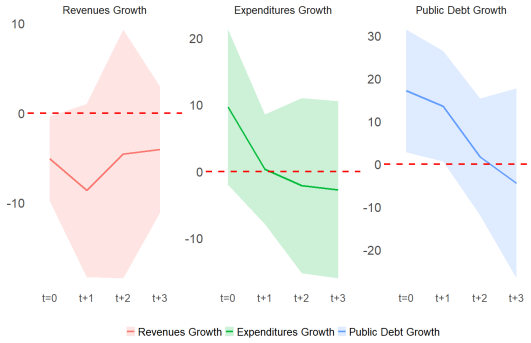
(b) Relationship between Expansions and BoP-related Metrics



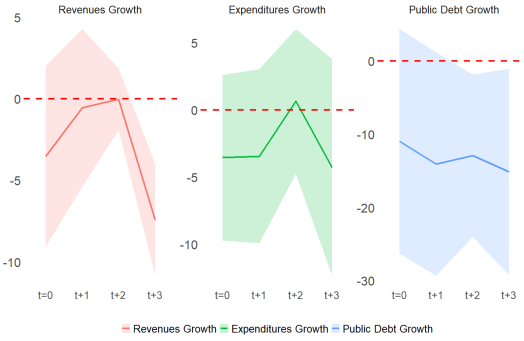
Source: IMF and Authors' own calculations

Figure 25: Asia: relationship between Recessions/Expansions and Fiscal-related Metrics (Percent)

(a) Relationship between Recessions and Fiscal-related Metrics



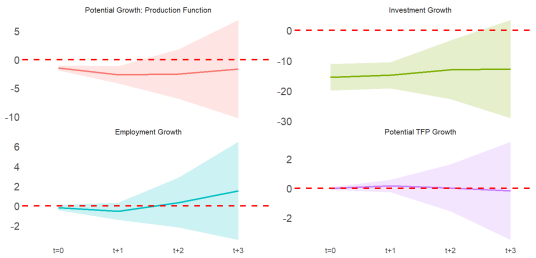
(b) Relationship between Expansions and Fiscal-related Metrics



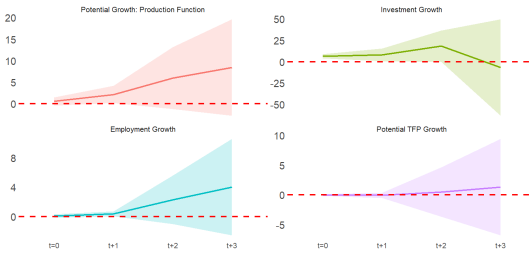
Source: IMF and Authors' own calculations

Figure 26: Narrow Definition: Impact of Recessions and Expansions on Potential Growth

(a) Impact of a Recession on Potential Growth



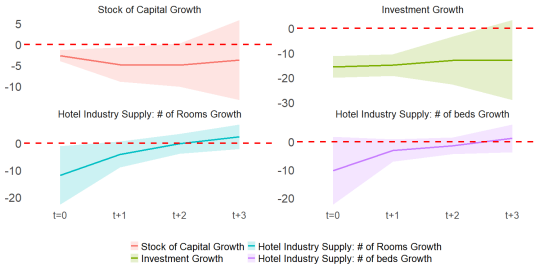
(b) Impact of an Expansion on Potential Growth



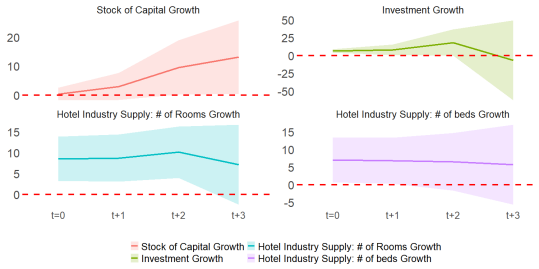
Source: IMF and Authors' own calculations. Note: The shaded area represents a 90 percent confidence interval.

Figure 27: Narrow Definition: Impact of Recessions and Expansions on Capital-related Metrics (Percent)

(a) Impact of a Recession on Capital-related Metrics



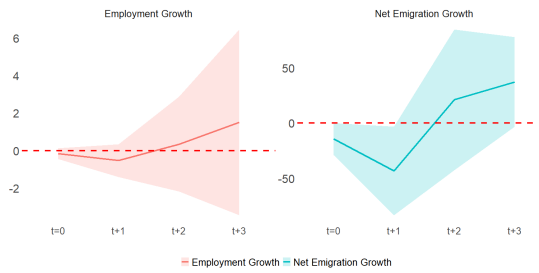
(b) Impact of an Expansion on Capital-related Metrics



Source: IMF and Authors' own calculations. Note: The shaded area represents a 90 percent confidence interval.

Figure 28: Narrow Definition: Impact of Recessions and Expansions on Labor-related Metrics (Percent)

(a) Impact of a Recession on labor-related Metrics

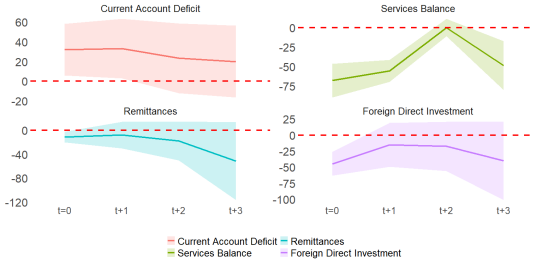


(b) Impact of an Expansion on Labor-related Metrics

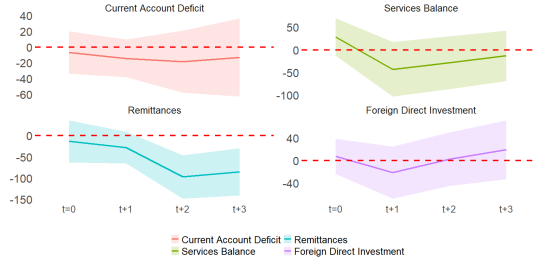
Source: IMF and Authors' own calculations. Note: The shaded area represents a 90 percent confidence interval.

Figure 29: Narrow Definition: Impact of Recessions and Expansions on BoP-related Metrics (Percent)

(a) Impact of a Recession on BoP-related Metrics



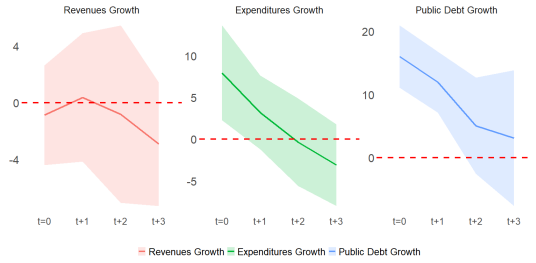
(b) Impact of an Expansion on BoP-related Metrics



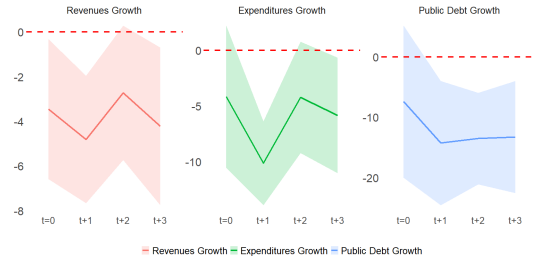
Source: IMF and Authors' own calculations. Note: The shaded area represents a 90 percent confidence interval.

Figure 30: Narrow Definition: Impact of Recessions and Expansions on Fiscal-related Metrics (Percent)

(a) Impact of a Recession on Fiscal-related Metrics



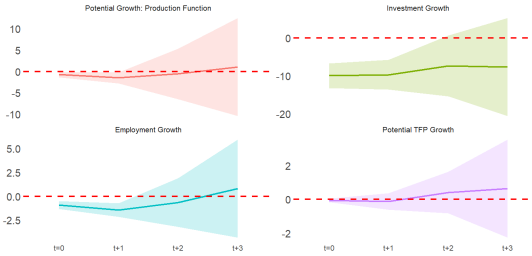
(b) Impact of an Expansion on Fiscal-related Metrics



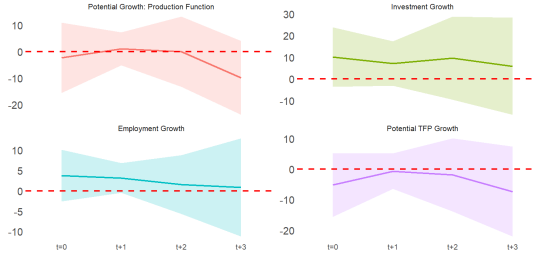
Source: IMF and Authors' own calculations. Note: The shaded area represents a 90 percent confidence interval.

Figure 31: Broad Definition: Impact of Recessions and Expansions on Potential Growth

(a) Impact of a Recession on Potential Growth



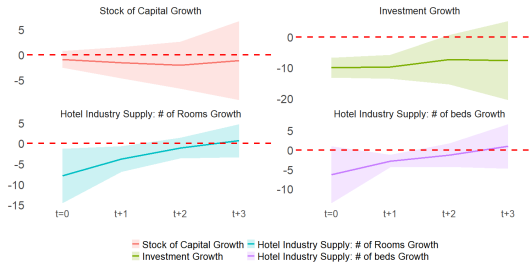
(b) Impact of an Expansion on Potential Growth



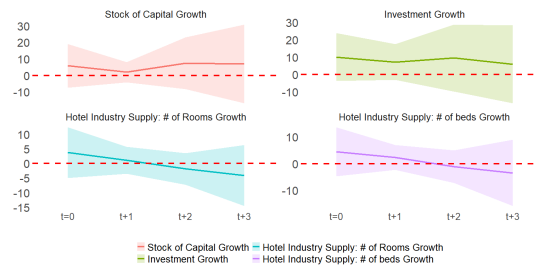
Source: IMF and Authors' own calculations. Note: The shaded area represents a 90 percent confidence interval.

Figure 32: Broad Definition: Impact of Recessions and Expansions on Capital-related Metrics (Percent)

(a) Impact of a Recession on Capital-related Metrics



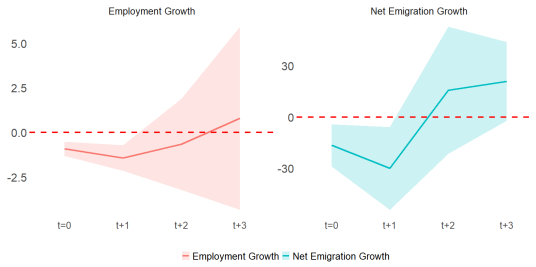
(b) Impact of an Expansion on Capital-related Metrics



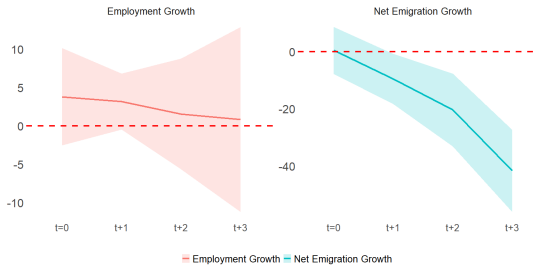
Source: IMF and Authors' own calculations. Note: The shaded area represents a 90 percent confidence interval.

Figure 33: Broad Definition: Impact of Recessions and Expansions on Labor-related Metrics (Percent)

(a) Impact of a Recession on labor-related Metrics



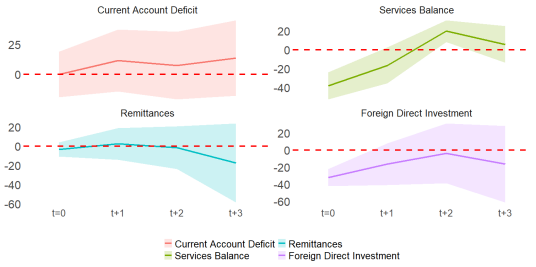
(b) Impact of an Expansion on Labor-related Metrics



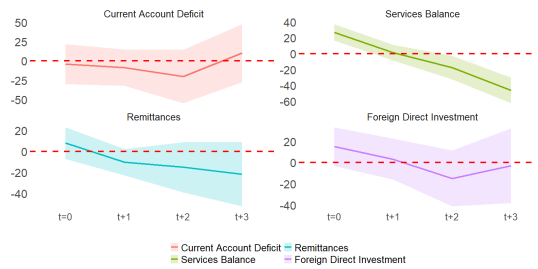
Source: IMF and Authors' own calculations. Note: The shaded area represents a 90 percent confidence interval.

Figure 34: Broad Definition: Impact of Recessions and Expansions on BoP-related Metrics (Percent)

(a) Impact of a Recession on BoP-related Metrics



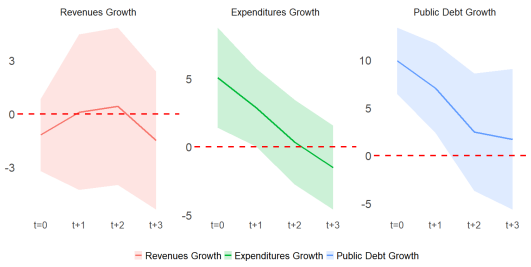
(b) Impact of an Expansion on BoP-related Metrics



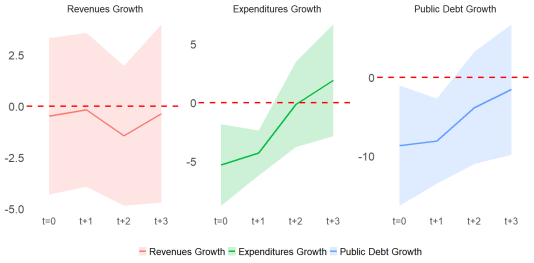
Source: IMF and Authors' own calculations. Note: The shaded area represents a 90 percent confidence interval.

Figure 35: Broad Definition: Impact of Recessions and Expansions on Fiscal-related Metrics (Percent)

(a) Impact of a Recession on Fiscal-related Metrics



(b) Impact of an Expansion on Fiscal-related Metrics



Source: IMF and Authors' own calculations. Note: The shaded area represents a 90 percent confidence interval.

Table 5: Recessions Baseline Results

Recession Type	Dependent Variable	Time	Coefficient & Standard Error
recession	Potential Growth: Production Function	t=0	-1.199*** (0.004)
recession	Potential Growth: Production Function	t+1	-2.582*** (0.005)
recession	Potential Growth: Production Function	t+2	-3.011 (0.022)
recession	Potential Growth: Production Function	t+3	-1.949 (0.051)
recession	Potential TFP Growth	t=0	0.014 (0.001)
recession	Potential TFP Growth	t+1	-0.021 (0.002)
recession	Potential TFP Growth	t+2	0.026 (0.007)
recession	Potential TFP Growth	t+3	-0.027 (0.013)
recession	Employment Growth	t=0	-0.227 (0.002)
recession	Employment Growth	t+1	-0.098 (0.003)
recession	Employment Growth	t+2	0.459 (0.016)
recession	Employment Growth	t+3	0.873 (0.031)
recession	Stock of Capital Growth	t=0	-2.089* (0.011)
recession	Stock of Capital Growth	t+1	-4.591*** (0.009)
recession	Stock of Capital Growth	t+2	-6.787*** (0.021)
recession	Stock of Capital Growth	t+3	-5.484 (0.048)
recession	Hotel Industry Supply: Rooms Growth	t=0	-15.651** (0.071)
recession	Hotel Industry Supply: Rooms Growth	t+1	-4.693* (0.024)
recession	Hotel Industry Supply: Rooms Growth	t+2	-0.448 (0.021)
recession	Hotel Industry Supply: Rooms Growth	t+3	-1.201 (0.029)
recession	Hotel Industry Supply: beds Growth	t=0	-9.818 (0.068)
recession	Hotel Industry Supply: beds Growth	t+1	-2.722 (0.024)
recession	Hotel Industry Supply: beds Growth	t+2	-1.842 (0.017)
recession	Hotel Industry Supply: beds Growth	t+3	0.022 (0.029)
recession	Investment Growth	t=0	-15.178*** (0.025)
recession	Investment Growth	t+1	-14.247*** (0.025)
recession	Investment Growth	t+2	-12.646** (0.057)
recession	Investment Growth	t+3	-11.897 (0.096)
recession	Net Emigration Growth	t=0	-13.28 (0.081)
recession	Net Emigration Growth	t+1	-40.183* (0.211)
recession	Net Emigration Growth	t+2	18.455 (0.366)
recession	Net Emigration Growth	t+3	35.691 (0.241)
recession	Current Account Deficit	t=0	33.05** (0.143)
recession	Current Account Deficit	t+1	21.432 (0.152)
recession	Current Account Deficit	t+2	26.533* (0.147)
recession	Current Account Deficit	t+3	19.93 (0.197)
recession	Services Balance	t=0	-62.31*** (0.09)
recession	Services Balance	t+1	-54.225*** (0.147)
recession	Services Balance	t+2	-10.628* (0.063)
recession	Services Balance	t+3	-41.449** (0.169)
recession	Remittances	t=0	-12.472** (0.055)
recession	Remittances	t+1	-4.078 (0.134)
recession	Remittances	t+2	-15.158 (0.198)
recession	Remittances	t+3	-43.871 (0.353)
recession	Foreign Direct Investment	t=0	-37.744*** (0.129)
recession	Foreign Direct Investment	t+1	-4.011 (0.228)
recession	Foreign Direct Investment	t+2	-19.439 (0.269)
recession	Foreign Direct Investment	t+3	-29.527 (0.386)
recession	Revenues Growth	t=0	0.026 (0.027)
recession	Revenues Growth	t+1	0.692 (0.033)
recession	Revenues Growth	t+2	0.478 (0.035)
recession	Revenues Growth	t+3	-1.481 (0.024)
recession	Expenditures Growth	t=0	7.736* (0.044)
recession	Expenditures Growth	t+1	4.516 (0.036)
recession	Expenditures Growth	t+2	0.974 (0.035)
recession	Expenditures Growth	t+3	-0.644 (0.034)
recession	Public Debt Growth	t=0	16.858*** (0.027)
recession	Public Debt Growth	t+1	13.574*** (0.032)
recession	Public Debt Growth	t+2	6.635 (0.042)
recession	Public Debt Growth	t+3	4.795 (0.059)

Table 6: Recessions Baseline with detrended GDP Results

Recession Type	Dependent Variable	Time	Coefficient & Standard Error
recession	Potential Growth: Production Function	t=0	-0.79 (0.007)
recession	Potential Growth: Production Function	t+1	-2.275*** (0.005)
recession	Potential Growth: Production Function	t+2	-2.497 (0.026)
recession	Potential Growth: Production Function	t+3	-1.601 (0.055)
recession	Potential TFP Growth	t=0	-0.001 (0.001)
recession	Potential TFP Growth	t+1	0.23 (0.003)
recession	Potential TFP Growth	t+2	0.401 (0.009)
recession	Potential TFP Growth	t+3	0.398 (0.017)
recession	Employment Growth	t=0	-0.109 (0.002)
recession	Employment Growth	t+1	-0.461** (0.002)
recession	Employment Growth	t+2	0.159 (0.016)
recession	Employment Growth	t+3	0.518 (0.032)
recession	Stock of Capital Growth	t=0	-1.312 (0.017)
recession	Stock of Capital Growth	t+1	-4.308*** (0.011)
recession	Stock of Capital Growth	t+2	-7.098*** (0.023)
recession	Stock of Capital Growth	t+3	-6.562 (0.046)
recession	Hotel Industry Supply: Rooms Growth	t=0	-14.44** (0.067)
recession	Hotel Industry Supply: Rooms Growth	t+1	-3.744 (0.024)
recession	Hotel Industry Supply: Rooms Growth	t+2	-0.565 (0.016)
recession	Hotel Industry Supply: Rooms Growth	t+3	-1.566 (0.034)
recession	Hotel Industry Supply: beds Growth	t=0	-8.538 (0.068)
recession	Hotel Industry Supply: beds Growth	t+1	-1.076 (0.03)
recession	Hotel Industry Supply: beds Growth	t+2	-0.462 (0.021)
recession	Hotel Industry Supply: beds Growth	t+3	1.264 (0.032)
recession	Investment Growth	t=0	-14.767*** (0.022)
recession	Investment Growth	t+1	-13.454*** (0.026)
recession	Investment Growth	t+2	-10.814* (0.058)
recession	Investment Growth	t+3	-11.081 (0.095)
recession	Net Emigration Growth	t=0	-18.943 (0.139)
recession	Net Emigration Growth	t+1	-36.023* (0.205)
recession	Net Emigration Growth	t+2	23.193 (0.196)
recession	Net Emigration Growth	t+3	24.634 (0.172)
recession	Current Account Deficit	t=0	27.45* (0.143)
recession	Current Account Deficit	t+1	30.017* (0.155)
recession	Current Account Deficit	t+2	27.984* (0.153)
recession	Current Account Deficit	t+3	23.187 (0.19)
recession	Services Balance	t=0	-64.586*** (0.084)
recession	Services Balance	t+1	-57.246*** (0.167)
recession	Services Balance	t+2	-11.944* (0.061)
recession	Services Balance	t+3	-43.271*** (0.15)
recession	Remittances	t=0	-6.828 (0.053)
recession	Remittances	t+1	-1.579 (0.137)
recession	Remittances	t+2	-11.879 (0.194)
recession	Remittances	t+3	-37.185 (0.357)
recession	Foreign Direct Investment	t=0	-38.432*** (0.13)
recession	Foreign Direct Investment	t+1	-5.202 (0.221)
recession	Foreign Direct Investment	t+2	-21.949 (0.262)
recession	Foreign Direct Investment	t+3	-28.884 (0.382)
recession	Revenues Growth	t=0	0.475 (0.026)
recession	Revenues Growth	t+1	-0.059 (0.034)
recession	Revenues Growth	t+2	0.921 (0.034)
recession	Revenues Growth	t+3	-0.934 (0.027)
recession	Expenditures Growth	t=0	8.921** (0.038)
recession	Expenditures Growth	t+1	7.324** (0.036)
recession	Expenditures Growth	t+2	2.803 (0.03)
recession	Expenditures Growth	t+3	1.063 (0.032)
recession	Public Debt Growth	t=0	14.895*** (0.026)
recession	Public Debt Growth	t+1	12.444*** (0.043)
recession	Public Debt Growth	t+2	5.843 (0.052)
recession	Public Debt Growth	t+3	5.713 (0.062)

Table 7: Recessions Baseline with major AEs growth identification

Recession Type	Dependent Variable	Time	Coefficient & Standard Error
recession	Potential Growth: Production Function	t=0	-0.483 (0.006)
recession	Potential Growth: Production Function	t+1	-1.881*** (0.006)
recession	Potential Growth: Production Function	t+2	0.965 (0.04)
recession	Potential Growth: Production Function	t+3	3.578 (0.077)
recession	Potential TFP Growth	t=0	0.016 (0)
recession	Potential TFP Growth	t+1	-0.05 (0.001)
recession	Potential TFP Growth	t+2	0.571 (0.021)
recession	Potential TFP Growth	t+3	1.075 (0.041)
recession	Employment Growth	t=0	-0.669** (0.003)
recession	Employment Growth	t+1	-0.397 (0.004)
recession	Employment Growth	t+2	1.481 (0.017)
recession	Employment Growth	t+3	3.17 (0.034)
recession	Stock of Capital Growth	t=0	-1.244 (0.013)
recession	Stock of Capital Growth	t+1	-4.511*** (0.014)
recession	Stock of Capital Growth	t+2	-4.76* (0.025)
recession	Stock of Capital Growth	t+3	-4.354 (0.042)
recession	Hotel Industry Supply: Rooms Growth	t=0	-14.493** (0.072)
recession	Hotel Industry Supply: Rooms Growth	t+1	-3 (0.034)
recession	Hotel Industry Supply: Rooms Growth	t+2	1.749 (0.022)
recession	Hotel Industry Supply: Rooms Growth	t+3	3.615 (0.028)
recession	Hotel Industry Supply: beds Growth	t=0	-13.117* (0.078)
recession	Hotel Industry Supply: beds Growth	t+1	-1.951 (0.021)
recession	Hotel Industry Supply: beds Growth	t+2	1.873 (0.02)
recession	Hotel Industry Supply: beds Growth	t+3	3.069 (0.034)
recession	Investment Growth	t=0	-14.792*** (0.022)
recession	Investment Growth	t+1	-10.12*** (0.025)
recession	Investment Growth	t+2	-5.207 (0.053)
recession	Investment Growth	t+3	-5.893 (0.084)
recession	Net Emigration Growth	t=0	-17.503** (0.077)
recession	Net Emigration Growth	t+1	-30.094*** (0.069)
recession	Net Emigration Growth	t+2	22.956 (0.447)
recession	Net Emigration Growth	t+3	41.817* (0.238)
recession	Current Account Deficit	t=0	10.781 (0.186)
recession	Current Account Deficit	t+1	5.763 (0.204)
recession	Current Account Deficit	t+2	10.675 (0.199)
recession	Current Account Deficit	t+3	-3.065 (0.25)
recession	Services Balance	t=0	-55.362*** (0.1)
recession	Services Balance	t+1	-42.445** (0.172)
recession	Services Balance	t+2	4.282 (0.079)
recession	Services Balance	t+3	-37.216** (0.167)
recession	Remittances	t=0	-5.661 (0.043)
recession	Remittances	t+1	1.481 (0.063)
recession	Remittances	t+2	9.341 (0.112)
recession	Remittances	t+3	14.606 (0.123)
recession	Foreign Direct Investment	t=0	-54.032*** (0.108)
recession	Foreign Direct Investment	t+1	-23.358 (0.275)
recession	Foreign Direct Investment	t+2	-44.247*** (0.163)
recession	Foreign Direct Investment	t+3	-49.224** (0.193)
recession	Revenues Growth	t=0	-0.687 (0.028)
recession	Revenues Growth	t+1	0.426 (0.032)
recession	Revenues Growth	t+2	-0.905 (0.034)
recession	Revenues Growth	t+3	-3.4 (0.028)
recession	Expenditures Growth	t=0	14.676*** (0.022)
recession	Expenditures Growth	t+1	11.108*** (0.021)
recession	Expenditures Growth	t+2	6.846*** (0.022)
recession	Expenditures Growth	t+3	2.896 (0.024)
recession	Public Debt Growth	t=0	15.866*** (0.032)
recession	Public Debt Growth	t+1	15.488*** (0.037)
recession	Public Debt Growth	t+2	11.691*** (0.038)
recession	Public Debt Growth	t+3	11.275*** (0.043)

Table 8: Recessions Alternative Identification (Narrow Definition) Results

Recession Type	Dependent Variable	Time	Coefficient & Standard Error
recession and negative tourism gap	Potential Growth: Production Function	t=0	-1.433*** (0.003)
recession and negative tourism gap	Potential Growth: Production Function	t+1	-2.659*** (0.009)
recession and negative tourism gap	Potential Growth: Production Function	t+2	-2.505 (0.026)
recession and negative tourism gap	Potential Growth: Production Function	t+3	-1.653 (0.052)
recession and negative tourism gap	Potential TFP Growth	t=0	-0.001 (0.001)
recession and negative tourism gap	Potential TFP Growth	t+1	0.166 (0.003)
recession and negative tourism gap	Potential TFP Growth	t+2	0.036 (0.01)
recession and negative tourism gap	Potential TFP Growth	t+3	-0.172 (0.02)
recession and negative tourism gap	Employment Growth	t=0	-0.159 (0.002)
recession and negative tourism gap	Employment Growth	t+1	-0.531 (0.005)
recession and negative tourism gap	Employment Growth	t+2	0.344 (0.015)
recession and negative tourism gap	Employment Growth	t+3	1.517 (0.03)
recession and negative tourism gap	Stock of Capital Growth	t=0	-2.613*** (0.008)
recession and negative tourism gap	Stock of Capital Growth	t+1	-4.792* (0.025)
recession and negative tourism gap	Stock of Capital Growth	t+2	-4.86 (0.031)
recession and negative tourism gap	Stock of Capital Growth	t+3	-3.697 (0.058)
recession and negative tourism gap	Hotel Industry Supply: Rooms Growth	t=0	-11.85* (0.066)
recession and negative tourism gap	Hotel Industry Supply: Rooms Growth	t+1	-4.185 (0.029)
recession and negative tourism gap	Hotel Industry Supply: Rooms Growth	t+2	-0.193 (0.022)
recession and negative tourism gap	Hotel Industry Supply: Rooms Growth	t+3	2.371 (0.028)
recession and negative tourism gap	Hotel Industry Supply: beds Growth	t=0	-10.269 (0.073)
recession and negative tourism gap	Hotel Industry Supply: beds Growth	t+1	-3.119 (0.024)
recession and negative tourism gap	Hotel Industry Supply: beds Growth	t+2	-1.478 (0.018)
recession and negative tourism gap	Hotel Industry Supply: beds Growth	t+3	1.212 (0.03)
recession and negative tourism gap	Investment Growth	t=0	-15.524*** (0.027)
recession and negative tourism gap	Investment Growth	t+1	-14.836*** (0.026)
recession and negative tourism gap	Investment Growth	t+2	-12.991** (0.059)
recession and negative tourism gap	Investment Growth	t+3	-12.807 (0.099)
recession and negative tourism gap	Net Emigration Growth	t=0	-14.348 (0.088)
recession and negative tourism gap	Net Emigration Growth	t+1	-43.145* (0.243)
recession and negative tourism gap	Net Emigration Growth	t+2	21.163 (0.387)
recession and negative tourism gap	Net Emigration Growth	t+3	37.271 (0.247)
recession and negative tourism gap	Current Account Deficit	t=0	32.202** (0.159)
recession and negative tourism gap	Current Account Deficit	t+1	33.105* (0.183)
recession and negative tourism gap	Current Account Deficit	t+2	23.273 (0.215)
recession and negative tourism gap	Current Account Deficit	t+3	20.013 (0.222)
recession and negative tourism gap	Services Balance	t=0	-68.048*** (0.132)
recession and negative tourism gap	Services Balance	t+1	-55.546*** (0.086)
recession and negative tourism gap	Services Balance	t+2	-0.025 (0.068)
recession and negative tourism gap	Services Balance	t+3	-48.596** (0.191)
recession and negative tourism gap	Remittances	t=0	-10.922** (0.054)
recession and negative tourism gap	Remittances	t+1	-7.829 (0.136)
recession and negative tourism gap	Remittances	t+2	-17.57 (0.199)
recession and negative tourism gap	Remittances	t+3	-51.532 (0.395)
recession and negative tourism gap	Foreign Direct Investment	t=0	-44.661*** (0.113)
recession and negative tourism gap	Foreign Direct Investment	t+1	-15.128 (0.207)
recession and negative tourism gap	Foreign Direct Investment	t+2	-17.476 (0.232)
recession and negative tourism gap	Foreign Direct Investment	t+3	-39.762 (0.372)
recession and negative tourism gap	Revenues Growth	t=0	-0.874 (0.021)
recession and negative tourism gap	Revenues Growth	t+1	0.377 (0.028)
recession and negative tourism gap	Revenues Growth	t+2	-0.802 (0.038)
recession and negative tourism gap	Revenues Growth	t+3	-2.921 (0.026)
recession and negative tourism gap	Expenditures Growth	t=0	7.965** (0.035)
recession and negative tourism gap	Expenditures Growth	t+1	3.224 (0.027)
recession and negative tourism gap	Expenditures Growth	t+2	-0.358 (0.032)
recession and negative tourism gap	Expenditures Growth	t+3	-3.089 (0.03)
recession and negative tourism gap	Public Debt Growth	t=0	16.025*** (0.03)
recession and negative tourism gap	Public Debt Growth	t+1	11.951*** (0.029)
recession and negative tourism gap	Public Debt Growth	t+2	5.06 (0.046)
recession and negative tourism gap	Public Debt Growth	t+3	3.106 (0.065)

Table 9: Recessions Alternative Identification (Broad Definition) Results

Recession Type	Dependent Variable	Time	Coefficient & Standard Error
negative tourism gap	Potential Growth: Production Function	t=0	-0.719* (0.004)
negative tourism gap	Potential Growth: Production Function	t+1	-1.466* (0.008)
negative tourism gap	Potential Growth: Production Function	t+2	-0.564 (0.036)
negative tourism gap	Potential Growth: Production Function	t+3	1.039 (0.07)
negative tourism gap	Potential TFP Growth	t=0	-0.058 (0.001)
negative tourism gap	Potential TFP Growth	t+1	-0.118 (0.003)
negative tourism gap	Potential TFP Growth	t+2	0.416 (0.007)
negative tourism gap	Potential TFP Growth	t+3	0.642 (0.018)
negative tourism gap	Employment Growth	t=0	-0.913*** (0.002)
negative tourism gap	Employment Growth	t+1	-1.425*** (0.004)
negative tourism gap	Employment Growth	t+2	-0.657 (0.016)
negative tourism gap	Employment Growth	t+3	0.805 (0.031)
negative tourism gap	Stock of Capital Growth	t=0	-0.915 (0.01)
negative tourism gap	Stock of Capital Growth	t+1	-1.562 (0.019)
negative tourism gap	Stock of Capital Growth	t+2	-2.036 (0.028)
negative tourism gap	Stock of Capital Growth	t+3	-1.155 (0.048)
negative tourism gap	Hotel Industry Supply: Rooms Growth	t=0	-7.904** (0.04)
negative tourism gap	Hotel Industry Supply: Rooms Growth	t+1	-3.772** (0.019)
negative tourism gap	Hotel Industry Supply: Rooms Growth	t+2	-1.105 (0.015)
negative tourism gap	Hotel Industry Supply: Rooms Growth	t+3	0.677 (0.025)
negative tourism gap	Hotel Industry Supply: beds Growth	t=0	-6.303 (0.045)
negative tourism gap	Hotel Industry Supply: beds Growth	t+1	-2.795*** (0.01)
negative tourism gap	Hotel Industry Supply: beds Growth	t+2	-1.264 (0.018)
negative tourism gap	Hotel Industry Supply: beds Growth	t+3	0.987 (0.035)
negative tourism gap	Investment Growth	t=0	-9.954*** (0.02)
negative tourism gap	Investment Growth	t+1	-9.712*** (0.024)
negative tourism gap	Investment Growth	t+2	-7.364 (0.049)
negative tourism gap	Investment Growth	t+3	-7.682 (0.078)
negative tourism gap	Net Emigration Growth	t=0	-16.506** (0.075)
negative tourism gap	Net Emigration Growth	t+1	-30.008** (0.147)
negative tourism gap	Net Emigration Growth	t+2	15.78 (0.226)
negative tourism gap	Net Emigration Growth	t+3	21.023 (0.14)
negative tourism gap	Current Account Deficit	t=0	-0.155 (0.117)
negative tourism gap	Current Account Deficit	t+1	11.613 (0.159)
negative tourism gap	Current Account Deficit	t+2	7.401 (0.174)
negative tourism gap	Current Account Deficit	t+3	13.708 (0.194)
negative tourism gap	Services Balance	t=0	-38.257*** (0.088)
negative tourism gap	Services Balance	t+1	-16.538 (0.115)
negative tourism gap	Services Balance	t+2	19.798*** (0.07)
negative tourism gap	Services Balance	t+3	5.715 (0.118)
negative tourism gap	Remittances	t=0	-3.458 (0.044)
negative tourism gap	Remittances	t+1	2.386 (0.099)
negative tourism gap	Remittances	t+2	-1.554 (0.135)
negative tourism gap	Remittances	t+3	-17.402 (0.25)
negative tourism gap	Foreign Direct Investment	t=0	-32.137*** (0.061)
negative tourism gap	Foreign Direct Investment	t+1	-16.35 (0.148)
negative tourism gap	Foreign Direct Investment	t+2	-3.604 (0.213)
negative tourism gap	Foreign Direct Investment	t+3	-16.357 (0.273)
negative tourism gap	Revenues Growth	t=0	-1.179 (0.012)
negative tourism gap	Revenues Growth	t+1	0.101 (0.027)
negative tourism gap	Revenues Growth	t+2	0.438 (0.027)
negative tourism gap	Revenues Growth	t+3	-1.498 (0.024)
negative tourism gap	Expenditures Growth	t=0	5.079** (0.022)
negative tourism gap	Expenditures Growth	t+1	2.88* (0.017)
negative tourism gap	Expenditures Growth	t+2	0.346 (0.019)
negative tourism gap	Expenditures Growth	t+3	-1.52 (0.019)
negative tourism gap	Public Debt Growth	t=0	9.929*** (0.021)
negative tourism gap	Public Debt Growth	t+1	7.044** (0.028)
negative tourism gap	Public Debt Growth	t+2	2.46 (0.037)
negative tourism gap	Public Debt Growth	t+3	1.717 (0.045)

Table 10: Expansions Baseline Results

Expansion Type	Dependent Variable	Time	Coefficient & Standard Error
expansion	Potential Growth: Production Function	t=0	1.172 (0.018)
expansion	Potential Growth: Production Function	t+1	2.801 (0.021)
expansion	Potential Growth: Production Function	t+2	12.001** (0.058)
expansion	Potential Growth: Production Function	t+3	14.793* (0.078)
expansion	Potential TFP Growth	t=0	-0.036 (0.001)
expansion	Potential TFP Growth	t+1	-0.07 (0.003)
expansion	Potential TFP Growth	t+2	0.856 (0.022)
expansion	Potential TFP Growth	t+3	1.773 (0.044)
expansion	Employment Growth	t=0	0.206 (0.018)
expansion	Employment Growth	t+1	0.12 (0.024)
expansion	Employment Growth	t+2	8.061 (0.06)
expansion	Employment Growth	t+3	9.181 (0.064)
expansion	Stock of Capital Growth	t=0	0.83 (0.026)
expansion	Stock of Capital Growth	t+1	4.289 (0.028)
expansion	Stock of Capital Growth	t+2	14.267** (0.071)
expansion	Stock of Capital Growth	t+3	18.735** (0.094)
expansion	Hotel Industry Supply: Rooms Growth	t=0	6.236* (0.038)
expansion	Hotel Industry Supply: Rooms Growth	t+1	6.321* (0.035)
expansion	Hotel Industry Supply: Rooms Growth	t+2	13.227*** (0.043)
expansion	Hotel Industry Supply: Rooms Growth	t+3	11.498** (0.058)
expansion	Hotel Industry Supply: beds Growth	t=0	3.537 (0.046)
expansion	Hotel Industry Supply: beds Growth	t+1	2.132 (0.036)
expansion	Hotel Industry Supply: beds Growth	t+2	9.994* (0.052)
expansion	Hotel Industry Supply: beds Growth	t+3	7.923 (0.07)
expansion	Investment Growth	t=0	6.988** (0.034)
expansion	Investment Growth	t+1	9.984** (0.046)
expansion	Investment Growth	t+2	21.791*** (0.076)
expansion	Investment Growth	t+3	4.542 (0.211)
expansion	Net Emigration Growth	t=0	5.816* (0.033)
expansion	Net Emigration Growth	t+1	10.096 (0.099)
expansion	Net Emigration Growth	t+2	12.718 (0.093)
expansion	Net Emigration Growth	t+3	16.649* (0.093)
expansion	Current Account Deficit	t=0	3.72 (0.132)
expansion	Current Account Deficit	t+1	-1.209 (0.12)
expansion	Current Account Deficit	t+2	-5.032 (0.16)
expansion	Current Account Deficit	t+3	-6.285 (0.237)
expansion	Services Balance	t=0	25.515 (0.225)
expansion	Services Balance	t+1	-29.862 (0.3)
expansion	Services Balance	t+2	-39.448 (0.336)
expansion	Services Balance	t+3	-29.363 (0.32)
expansion	Remittances	t=0	1.952 (0.251)
expansion	Remittances	t+1	-0.14 (0.22)
expansion	Remittances	t+2	-42.55 (0.303)
expansion	Remittances	t+3	-48.794* (0.261)
expansion	Foreign Direct Investment	t=0	13.445 (0.124)
expansion	Foreign Direct Investment	t+1	-17.765 (0.22)
expansion	Foreign Direct Investment	t+2	10.499 (0.239)
expansion	Foreign Direct Investment	t+3	28.625 (0.279)
expansion	Revenues Growth	t=0	-1.895 (0.012)
expansion	Revenues Growth	t+1	-2.308 (0.017)
expansion	Revenues Growth	t+2	-2.96** (0.014)
expansion	Revenues Growth	t+3	-4.357*** (0.015)
expansion	Expenditures Growth	t=0	-1.424 (0.025)
expansion	Expenditures Growth	t+1	-4.848** (0.02)
expansion	Expenditures Growth	t+2	-3.129 (0.025)
expansion	Expenditures Growth	t+3	-4.672* (0.026)
expansion	Public Debt Growth	t=0	-7.922 (0.055)
expansion	Public Debt Growth	t+1	-12.978*** (0.044)
expansion	Public Debt Growth	t+2	-9.711** (0.045)
expansion	Public Debt Growth	t+3	-11.338** (0.054)

Table 11: Expansions Baseline with detrended GDP Results

Expansion Type	Dependent Variable	Time	Coefficient & Standard Error
expansion	Potential Growth: Production Function	t=0	0.247 (0.02)
expansion	Potential Growth: Production Function	t+1	1.382 (0.022)
expansion	Potential Growth: Production Function	t+2	10.459* (0.06)
expansion	Potential Growth: Production Function	t+3	13.323* (0.078)
expansion	Potential TFP Growth	t=0	-0.021 (0.001)
expansion	Potential TFP Growth	t+1	-0.081 (0.003)
expansion	Potential TFP Growth	t+2	0.743 (0.018)
expansion	Potential TFP Growth	t+3	1.636 (0.035)
expansion	Employment Growth	t=0	0.203 (0.019)
expansion	Employment Growth	t+1	0.053 (0.026)
expansion	Employment Growth	t+2	7.633 (0.063)
expansion	Employment Growth	t+3	8.172 (0.066)
expansion	Stock of Capital Growth	t=0	-0.289 (0.027)
expansion	Stock of Capital Growth	t+1	2.265 (0.031)
expansion	Stock of Capital Growth	t+2	11.951 (0.076)
expansion	Stock of Capital Growth	t+3	16.267* (0.097)
expansion	Hotel Industry Supply: Rooms Growth	t=0	5.765 (0.053)
expansion	Hotel Industry Supply: Rooms Growth	t+1	6.166 (0.041)
expansion	Hotel Industry Supply: Rooms Growth	t+2	12.806*** (0.049)
expansion	Hotel Industry Supply: Rooms Growth	t+3	8.956 (0.057)
expansion	Hotel Industry Supply: beds Growth	t=0	2.404 (0.049)
expansion	Hotel Industry Supply: beds Growth	t+1	1.062 (0.034)
expansion	Hotel Industry Supply: beds Growth	t+2	7.821 (0.048)
expansion	Hotel Industry Supply: beds Growth	t+3	4.519 (0.062)
expansion	Investment Growth	t=0	7.393 (0.101)
expansion	Investment Growth	t+1	15.346** (0.068)
expansion	Investment Growth	t+2	20.175*** (0.069)
expansion	Investment Growth	t+3	2.147 (0.22)
expansion	Net Emigration Growth	t=0	2.321 (0.027)
expansion	Net Emigration Growth	t+1	-6.077 (0.123)
expansion	Net Emigration Growth	t+2	-4.516 (0.079)
expansion	Net Emigration Growth	t+3	-1.673 (0.111)
expansion	Current Account Deficit	t=0	-5.694 (0.136)
expansion	Current Account Deficit	t+1	-15.206 (0.165)
expansion	Current Account Deficit	t+2	-20.095 (0.199)
expansion	Current Account Deficit	t+3	-18.691 (0.295)
expansion	Services Balance	t=0	41.477** (0.204)
expansion	Services Balance	t+1	-30.649 (0.296)
expansion	Services Balance	t+2	-34.706 (0.348)
expansion	Services Balance	t+3	-17.111 (0.314)
expansion	Remittances	t=0	-11.374 (0.188)
expansion	Remittances	t+1	-4.973 (0.101)
expansion	Remittances	t+2	-47.593** (0.238)
expansion	Remittances	t+3	-44.68* (0.268)
expansion	Foreign Direct Investment	t=0	10.571 (0.17)
expansion	Foreign Direct Investment	t+1	-32.487 (0.299)
expansion	Foreign Direct Investment	t+2	-7.154 (0.272)
expansion	Foreign Direct Investment	t+3	13.081 (0.311)
expansion	Revenues Growth	t=0	-2.211 (0.019)
expansion	Revenues Growth	t+1	-1.081 (0.023)
expansion	Revenues Growth	t+2	-2.583 (0.017)
expansion	Revenues Growth	t+3	-2.554 (0.022)
expansion	Expenditures Growth	t=0	-3.194 (0.03)
expansion	Expenditures Growth	t+1	-6.233*** (0.02)
expansion	Expenditures Growth	t+2	-1.135 (0.023)
expansion	Expenditures Growth	t+3	-3.872 (0.033)
expansion	Public Debt Growth	t=0	-10.29* (0.062)
expansion	Public Debt Growth	t+1	-15.331*** (0.045)
expansion	Public Debt Growth	t+2	-6.399** (0.026)
expansion	Public Debt Growth	t+3	-2.933 (0.051)

Table 12: Expansions Baseline with major AEs growth identification

Expansion Type	Dependent Variable	Time	Coefficient & Standard Error
expansion	Potential Growth: Production Function	t=0	0.357 (0.003)
expansion	Potential Growth: Production Function	t+1	0.825* (0.004)
expansion	Potential Growth: Production Function	t+2	5.028 (0.04)
expansion	Potential Growth: Production Function	t+3	7.798 (0.077)
expansion	Potential TFP Growth	t=0	0.183*** (0.001)
expansion	Potential TFP Growth	t+1	0.62*** (0.002)
expansion	Potential TFP Growth	t+2	2.484 (0.024)
expansion	Potential TFP Growth	t+3	4.213 (0.048)
expansion	Employment Growth	t=0	0.462 (0.003)
expansion	Employment Growth	t+1	0.531* (0.003)
expansion	Employment Growth	t+2	1.916 (0.02)
expansion	Employment Growth	t+3	3.633 (0.037)
expansion	Stock of Capital Growth	t=0	-0.046 (0.007)
expansion	Stock of Capital Growth	t+1	-0.797 (0.008)
expansion	Stock of Capital Growth	t+2	4.293 (0.035)
expansion	Stock of Capital Growth	t+3	7.093 (0.06)
expansion	Hotel Industry Supply: Rooms Growth	t=0	9.967* (0.054)
expansion	Hotel Industry Supply: Rooms Growth	t+1	10.036** (0.047)
expansion	Hotel Industry Supply: Rooms Growth	t+2	13.419** (0.061)
expansion	Hotel Industry Supply: Rooms Growth	t+3	11.897* (0.071)
expansion	Hotel Industry Supply: beds Growth	t=0	10.984* (0.057)
expansion	Hotel Industry Supply: beds Growth	t+1	10.512* (0.055)
expansion	Hotel Industry Supply: beds Growth	t+2	13.514** (0.067)
expansion	Hotel Industry Supply: beds Growth	t+3	12.493 (0.078)
expansion	Investment Growth	t=0	8.159*** (0.031)
expansion	Investment Growth	t+1	13.585*** (0.044)
expansion	Investment Growth	t+2	11.711** (0.049)
expansion	Investment Growth	t+3	12.798** (0.055)
expansion	Net Emigration Growth	t=0	10.218 (0.092)
expansion	Net Emigration Growth	t+1	25.499 (0.422)
expansion	Net Emigration Growth	t+2	30.677 (0.319)
expansion	Net Emigration Growth	t+3	23.493 (0.339)
expansion	Current Account Deficit	t=0	-8.408 (0.146)
expansion	Current Account Deficit	t+1	2.115 (0.172)
expansion	Current Account Deficit	t+2	-13.193 (0.193)
expansion	Current Account Deficit	t+3	-6.054 (0.194)
expansion	Services Balance	t=0	-34.959 (0.478)
expansion	Services Balance	t+1	47.722* (0.245)
expansion	Services Balance	t+2	-91.607*** (0.345)
expansion	Services Balance	t+3	-85.608*** (0.262)
expansion	Remittances	t=0	14.503 (0.091)
expansion	Remittances	t+1	-2.371 (0.248)
expansion	Remittances	t+2	-7.45 (0.27)
expansion	Remittances	t+3	-76.362* (0.446)
expansion	Foreign Direct Investment	t=0	38.083* (0.197)
expansion	Foreign Direct Investment	t+1	3.752 (0.16)
expansion	Foreign Direct Investment	t+2	2.711 (0.493)
expansion	Foreign Direct Investment	t+3	34.918 (0.549)
expansion	Revenues Growth	t=0	-0.676 (0.023)
expansion	Revenues Growth	t+1	-3.697 (0.029)
expansion	Revenues Growth	t+2	-1.984 (0.028)
expansion	Revenues Growth	t+3	0.176 (0.033)
expansion	Expenditures Growth	t=0	1.921 (0.021)
expansion	Expenditures Growth	t+1	-2.133 (0.032)
expansion	Expenditures Growth	t+2	1.192 (0.04)
expansion	Expenditures Growth	t+3	-4.731 (0.039)
expansion	Public Debt Growth	t=0	1.844 (0.023)
expansion	Public Debt Growth	t+1	0.61 (0.027)
expansion	Public Debt Growth	t+2	5.584 (0.044)
expansion	Public Debt Growth	t+3	1.932 (0.052)

Table 13: Expansions Alternative Identification (Narrow Definition) Results

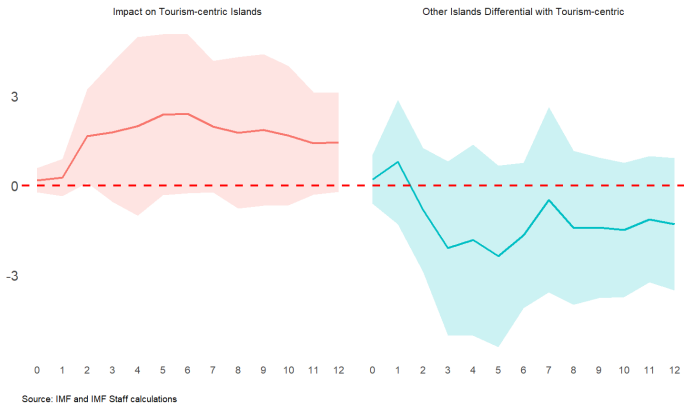
Expansion Type	Dependent Variable	Time	Coefficient & Standard Error
expansion and positive tourism gap	Potential Growth: Production Function	t=0	0.546 (0.006)
expansion and positive tourism gap	Potential Growth: Production Function	t+1	2.153* (0.012)
expansion and positive tourism gap	Potential Growth: Production Function	t+2	5.967 (0.044)
expansion and positive tourism gap	Potential Growth: Production Function	t+3	8.398 (0.068)
expansion and positive tourism gap	Potential TFP Growth	t=0	-0.01 (0.001)
expansion and positive tourism gap	Potential TFP Growth	t+1	-0.064 (0.003)
expansion and positive tourism gap	Potential TFP Growth	t+2	0.492 (0.025)
expansion and positive tourism gap	Potential TFP Growth	t+3	1.308 (0.049)
expansion and positive tourism gap	Employment Growth	t=0	0.08 (0.002)
expansion and positive tourism gap	Employment Growth	t+1	0.371* (0.002)
expansion and positive tourism gap	Employment Growth	t+2	2.282 (0.02)
expansion and positive tourism gap	Employment Growth	t+3	4.004 (0.04)
expansion and positive tourism gap	Stock of Capital Growth	t=0	0.365 (0.013)
expansion and positive tourism gap	Stock of Capital Growth	t+1	2.968 (0.028)
expansion and positive tourism gap	Stock of Capital Growth	t+2	9.584* (0.057)
expansion and positive tourism gap	Stock of Capital Growth	t+3	13.165* (0.077)
expansion and positive tourism gap	Hotel Industry Supply: Rooms Growth	t=0	8.553*** (0.032)
expansion and positive tourism gap	Hotel Industry Supply: Rooms Growth	t+1	8.709** (0.034)
expansion and positive tourism gap	Hotel Industry Supply: Rooms Growth	t+2	10.119*** (0.037)
expansion and positive tourism gap	Hotel Industry Supply: Rooms Growth	t+3	7.153 (0.058)
expansion and positive tourism gap	Hotel Industry Supply: beds Growth	t=0	7.102* (0.039)
expansion and positive tourism gap	Hotel Industry Supply: beds Growth	t+1	6.816* (0.04)
expansion and positive tourism gap	Hotel Industry Supply: beds Growth	t+2	6.55 (0.05)
expansion and positive tourism gap	Hotel Industry Supply: beds Growth	t+3	5.745 (0.069)
expansion and positive tourism gap	Investment Growth	t=0	6.551*** (0.015)
expansion and positive tourism gap	Investment Growth	t+1	8.101* (0.044)
expansion and positive tourism gap	Investment Growth	t+2	18.234 (0.112)
expansion and positive tourism gap	Investment Growth	t+3	-6.828 (0.342)
expansion and positive tourism gap	Net Emigration Growth	t=0	-8.386 (0.121)
expansion and positive tourism gap	Net Emigration Growth	t+1	-19.806 (0.138)
expansion and positive tourism gap	Net Emigration Growth	t+2	-14.94 (0.122)
expansion and positive tourism gap	Net Emigration Growth	t+3	-16.85 (0.132)
expansion and positive tourism gap	Current Account Deficit	t=0	-6.842 (0.162)
expansion and positive tourism gap	Current Account Deficit	t+1	-14.241 (0.145)
expansion and positive tourism gap	Current Account Deficit	t+2	-18.403 (0.24)
expansion and positive tourism gap	Current Account Deficit	t+3	-13.141 (0.302)
expansion and positive tourism gap	Services Balance	t=0	28.404 (0.25)
expansion and positive tourism gap	Services Balance	t+1	-42.879 (0.366)
expansion and positive tourism gap	Services Balance	t+2	-28.405 (0.353)
expansion and positive tourism gap	Services Balance	t+3	-13.178 (0.335)
expansion and positive tourism gap	Remittances	t=0	-13.11 (0.3)
expansion and positive tourism gap	Remittances	t+1	-27.843 (0.227)
expansion and positive tourism gap	Remittances	t+2	-96.967*** (0.31)
expansion and positive tourism gap	Remittances	t+3	-85.272** (0.337)
expansion and positive tourism gap	Foreign Direct Investment	t=0	7.488 (0.19)
expansion and positive tourism gap	Foreign Direct Investment	t+1	-21.348 (0.283)
expansion and positive tourism gap	Foreign Direct Investment	t+2	2.424 (0.29)
expansion and positive tourism gap	Foreign Direct Investment	t+3	19.315 (0.319)
expansion and positive tourism gap	Revenues Growth	t=0	-3.462* (0.019)
expansion and positive tourism gap	Revenues Growth	t+1	-4.815*** (0.017)
expansion and positive tourism gap	Revenues Growth	t+2	-2.724 (0.018)
expansion and positive tourism gap	Revenues Growth	t+3	-4.225** (0.021)
expansion and positive tourism gap	Expenditures Growth	t=0	-4.15 (0.039)
expansion and positive tourism gap	Expenditures Growth	t+1	-10.124*** (0.023)
expansion and positive tourism gap	Expenditures Growth	t+2	-4.213 (0.03)
expansion and positive tourism gap	Expenditures Growth	t+3	-5.841* (0.032)
expansion and positive tourism gap	Public Debt Growth	t=0	-7.397 (0.077)
expansion and positive tourism gap	Public Debt Growth	t+1	-14.269** (0.062)
expansion and positive tourism gap	Public Debt Growth	t+2	-13.497*** (0.046)
expansion and positive tourism gap	Public Debt Growth	t+3	-13.258** (0.057)

Table 14: Recessions Alternative Identification (Broad Definition) Results

Expansion Type	Dependent Variable	Time	Coefficient & Standard Error
positive tourism gap	Potential Growth: Production Function	t=0	-2.334 (0.081)
positive tourism gap	Potential Growth: Production Function	t+1	1.008 (0.038)
positive tourism gap	Potential Growth: Production Function	t+2	-0.105 (0.08)
positive tourism gap	Potential Growth: Production Function	t+3	-9.906 (0.085)
positive tourism gap	Potential TFP Growth	t=0	-5.176 (0.063)
positive tourism gap	Potential TFP Growth	t+1	-0.659 (0.035)
positive tourism gap	Potential TFP Growth	t+2	-1.918 (0.073)
positive tourism gap	Potential TFP Growth	t+3	-7.353 (0.089)
positive tourism gap	Employment Growth	t=0	3.797 (0.038)
positive tourism gap	Employment Growth	t+1	3.168 (0.022)
positive tourism gap	Employment Growth	t+2	1.543 (0.044)
positive tourism gap	Employment Growth	t+3	0.85 (0.073)
positive tourism gap	Stock of Capital Growth	t=0	5.847 (0.08)
positive tourism gap	Stock of Capital Growth	t+1	1.944 (0.037)
positive tourism gap	Stock of Capital Growth	t+2	7.34 (0.095)
positive tourism gap	Stock of Capital Growth	t+3	6.947 (0.145)
positive tourism gap	Hotel Industry Supply: Rooms Growth	t=0	3.747 (0.053)
positive tourism gap	Hotel Industry Supply: Rooms Growth	t+1	1.107 (0.028)
positive tourism gap	Hotel Industry Supply: Rooms Growth	t+2	-1.86 (0.032)
positive tourism gap	Hotel Industry Supply: Rooms Growth	t+3	-4.129 (0.063)
positive tourism gap	Hotel Industry Supply: beds Growth	t=0	4.461 (0.056)
positive tourism gap	Hotel Industry Supply: beds Growth	t+1	2.347 (0.028)
positive tourism gap	Hotel Industry Supply: beds Growth	t+2	-1.078 (0.037)
positive tourism gap	Hotel Industry Supply: beds Growth	t+3	-3.446 (0.075)
positive tourism gap	Investment Growth	t=0	10.099 (0.084)
positive tourism gap	Investment Growth	t+1	7.213 (0.062)
positive tourism gap	Investment Growth	t+2	9.567 (0.117)
positive tourism gap	Investment Growth	t+3	5.891 (0.136)
positive tourism gap	Net Emigration Growth	t=0	0.46 (0.05)
positive tourism gap	Net Emigration Growth	t+1	-9.5* (0.053)
positive tourism gap	Net Emigration Growth	t+2	-20.37*** (0.077)
positive tourism gap	Net Emigration Growth	t+3	-41.733*** (0.087)
positive tourism gap	Current Account Deficit	t=0	-4.02 (0.156)
positive tourism gap	Current Account Deficit	t+1	-8.513 (0.143)
positive tourism gap	Current Account Deficit	t+2	-20.153 (0.209)
positive tourism gap	Current Account Deficit	t+3	10.176 (0.227)
positive tourism gap	Services Balance	t=0	26.769*** (0.063)
positive tourism gap	Services Balance	t+1	1.341 (0.06)
positive tourism gap	Services Balance	t+2	-17.341* (0.09)
positive tourism gap	Services Balance	t+3	-46.225*** (0.099)
positive tourism gap	Remittances	t=0	7.999 (0.092)
positive tourism gap	Remittances	t+1	-10.353 (0.076)
positive tourism gap	Remittances	t+2	-15.101 (0.145)
positive tourism gap	Remittances	t+3	-21.866 (0.185)
positive tourism gap	Foreign Direct Investment	t=0	15.13 (0.112)
positive tourism gap	Foreign Direct Investment	t+1	3.251 (0.117)
positive tourism gap	Foreign Direct Investment	t+2	-14.809 (0.16)
positive tourism gap	Foreign Direct Investment	t+3	-2.79 (0.214)
positive tourism gap	Revenues Growth	t=0	-0.487 (0.023)
positive tourism gap	Revenues Growth	t+1	-0.178 (0.023)
positive tourism gap	Revenues Growth	t+2	-1.435 (0.021)
positive tourism gap	Revenues Growth	t+3	-0.353 (0.026)
positive tourism gap	Expenditures Growth	t=0	-5.285** (0.021)
positive tourism gap	Expenditures Growth	t+1	-4.276*** (0.012)
positive tourism gap	Expenditures Growth	t+2	-0.16 (0.022)
positive tourism gap	Expenditures Growth	t+3	1.92 (0.029)
positive tourism gap	Public Debt Growth	t=0	-8.651* (0.046)
positive tourism gap	Public Debt Growth	t+1	-8.092** (0.033)
positive tourism gap	Public Debt Growth	t+2	-3.856 (0.043)
positive tourism gap	Public Debt Growth	t+3	-1.547 (0.05)

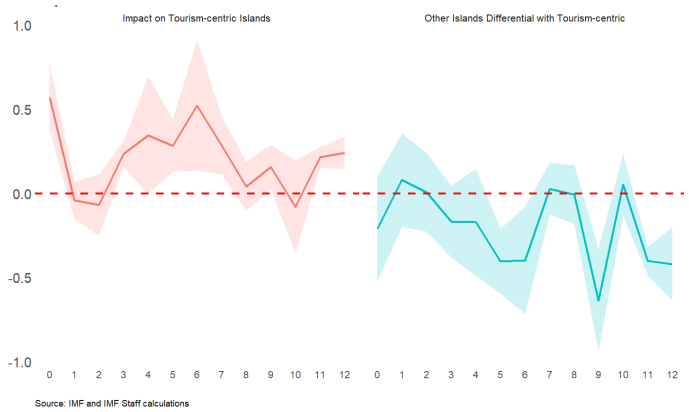
Annex C: Short-term influence of tourism on growth

Figure 36: Impact of 1 Percent increase in Tourism flows on Domestic VAT (Percent) by Tourism Dependency Before the Pandemic



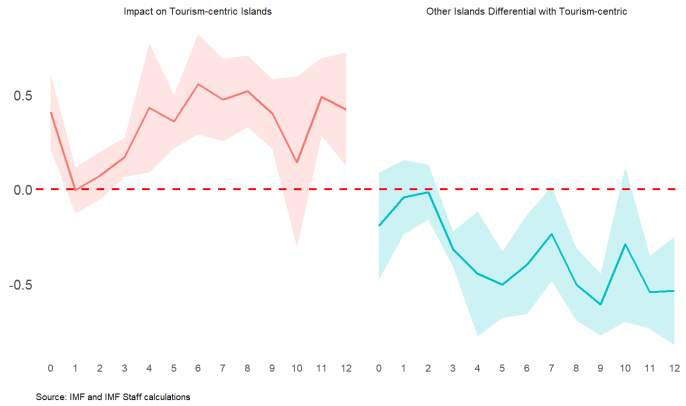
Source: IMF and Authors' own calculations. Note: The shaded area represents a 90 percent confidence interval.

Figure 37: Impact of 1 Percent increase in Tourism flows on Domestic VAT (Percent) by Tourism Dependency After the Pandemic



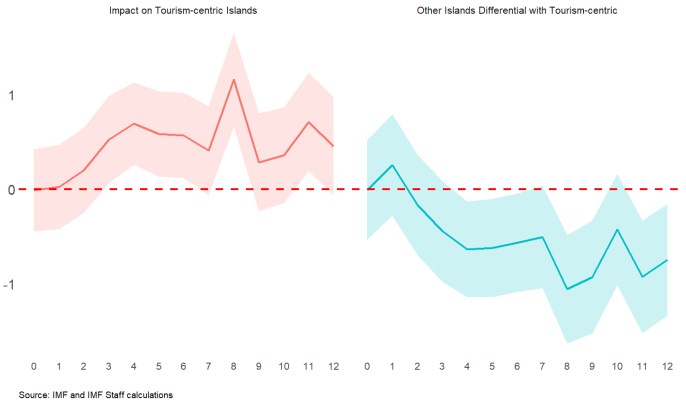
Source: IMF and Authors' own calculations. Note: The shaded area represents a 90 percent confidence interval.

Figure 38: Impact of 1 Percent increase in Tourism flows on Domestic VAT (Percent) by Tourism Dependency Including Santiago Island



Source: IMF and Authors' own calculations. Note: The shaded area represents a 90 percent confidence interval.

Figure 39: Impact of 1 Percent increase in Tourism flows on Domestic VAT (Percent) by Tourism Dependency IV



Source: IMF and Authors' own calculations. Note: The shaded area represents a 90 percent confidence interval.

Table 15: Baseline Results

Variable Name	Horizon	Coefficient
Impact on Tourism-centric Islands	0	0.402*** (0.134)
Impact on Tourism-centric Islands	1	-0.012 (0.074)
Impact on Tourism-centric Islands	2	0.055 (0.08)
Impact on Tourism-centric Islands	3	0.135* (0.072)
Impact on Tourism-centric Islands	4	0.394* (0.212)
Impact on Tourism-centric Islands	5	0.34*** (0.096)
Impact on Tourism-centric Islands	6	0.553*** (0.181)
Impact on Tourism-centric Islands	7	0.452*** (0.145)
Impact on Tourism-centric Islands	8	0.486*** (0.129)
Impact on Tourism-centric Islands	9	0.365*** (0.129)
Impact on Tourism-centric Islands	10	0.107 (0.292)
Impact on Tourism-centric Islands	11	0.449*** (0.133)
Impact on Tourism-centric Islands	12	0.379** (0.189)
Other Islands Differential with Tourism-centric	0	-0.175 (0.233)
Other Islands Differential with Tourism-centric	1	-0.089 (0.125)
Other Islands Differential with Tourism-centric	2	0.012 (0.091)
Other Islands Differential with Tourism-centric	3	-0.354*** (0.07)
Other Islands Differential with Tourism-centric	4	-0.459** (0.221)
Other Islands Differential with Tourism-centric	5	-0.562*** (0.125)
Other Islands Differential with Tourism-centric	6	-0.336* (0.185)
Other Islands Differential with Tourism-centric	7	-0.165 (0.169)
Other Islands Differential with Tourism-centric	8	-0.421*** (0.09)
Other Islands Differential with Tourism-centric	9	-0.65*** (0.104)
Other Islands Differential with Tourism-centric	10	-0.243 (0.249)
Other Islands Differential with Tourism-centric	11	-0.513*** (0.122)
Other Islands Differential with Tourism-centric	12	-0.55*** (0.174)

Table 16: Before the Pandemic

Variable Name	Horizon Standard Error	Coefficient
Impact on Tourism-centric Islands	0	0.175 (0.246)
Impact on Tourism-centric Islands	1	0.265 (0.376)
Impact on Tourism-centric Islands	2	1.652* (0.948)
Impact on Tourism-centric Islands	3	1.787 (1.423)
Impact on Tourism-centric Islands	4	1.984 (1.819)
Impact on Tourism-centric Islands	5	2.369 (1.641)
Impact on Tourism-centric Islands	6	2.406 (1.624)
Impact on Tourism-centric Islands	7	1.973 (1.34)
Impact on Tourism-centric Islands	8	1.768 (1.544)
Impact on Tourism-centric Islands	9	1.866 (1.543)
Impact on Tourism-centric Islands	10	1.674 (1.42)
Impact on Tourism-centric Islands	11	1.411 (1.046)
Impact on Tourism-centric Islands	12	1.442 (1.01)
Other Islands Differential with Tourism-centric	0	0.21 (0.499)
Other Islands Differential with Tourism-centric	1	0.787 (1.266)
Other Islands Differential with Tourism-centric	2	-0.815 (1.261)
Other Islands Differential with Tourism-centric	3	-2.103 (1.772)
Other Islands Differential with Tourism-centric	4	-1.834 (1.942)
Other Islands Differential with Tourism-centric	5	-2.373 (1.85)
Other Islands Differential with Tourism-centric	6	-1.674 (1.483)
Other Islands Differential with Tourism-centric	7	-0.477 (1.889)
Other Islands Differential with Tourism-centric	8	-1.426 (1.568)
Other Islands Differential with Tourism-centric	9	-1.418 (1.43)
Other Islands Differential with Tourism-centric	10	-1.488 (1.369)
Other Islands Differential with Tourism-centric	11	-1.137 (1.286)
Other Islands Differential with Tourism-centric	12	-1.301 (1.35)

Table 17: After the Pandemic

Variable Name	Horizon Standard Error	Coefficient
Impact on Tourism-centric Islands	0	0.571*** (0.121)
Impact on Tourism-centric Islands	1	-0.041 (0.067)
Impact on Tourism-centric Islands	2	-0.069 (0.112)
Impact on Tourism-centric Islands	3	0.235*** (0.046)
Impact on Tourism-centric Islands	4	0.346 (0.213)
Impact on Tourism-centric Islands	5	0.284*** (0.095)
Impact on Tourism-centric Islands	6	0.522** (0.235)
Impact on Tourism-centric Islands	7	0.287*** (0.105)
Impact on Tourism-centric Islands	8	0.042 (0.088)
Impact on Tourism-centric Islands	9	0.157* (0.08)
Impact on Tourism-centric Islands	10	-0.08 (0.167)
Impact on Tourism-centric Islands	11	0.215*** (0.037)
Impact on Tourism-centric Islands	12	0.241*** (0.059)
Other Islands Differential with Tourism-centric	0	-0.211 (0.187)
Other Islands Differential with Tourism-centric	1	0.08 (0.168)
Other Islands Differential with Tourism-centric	2	0.007 (0.142)
Other Islands Differential with Tourism-centric	3	-0.168 (0.13)
Other Islands Differential with Tourism-centric	4	-0.171 (0.192)
Other Islands Differential with Tourism-centric	5	-0.403*** (0.117)
Other Islands Differential with Tourism-centric	6	-0.397** (0.194)
Other Islands Differential with Tourism-centric	7	0.028 (0.093)
Other Islands Differential with Tourism-centric	8	-0.006 (0.106)
Other Islands Differential with Tourism-centric	9	-0.636*** (0.185)
Other Islands Differential with Tourism-centric	10	0.051 (0.113)
Other Islands Differential with Tourism-centric	11	-0.401*** (0.051)
Other Islands Differential with Tourism-centric	12	-0.42*** (0.133)

Table 18: Including Santiago island

Variable Name	Horizon Standard Error	Coefficient
Impact on Tourism-centric Islands	0	0.41*** (0.122)
Impact on Tourism-centric Islands	1	-0.005 (0.075)
Impact on Tourism-centric Islands	2	0.072 (0.076)
Impact on Tourism-centric Islands	3	0.17*** (0.064)
Impact on Tourism-centric Islands	4	0.432** (0.208)
Impact on Tourism-centric Islands	5	0.36*** (0.085)
Impact on Tourism-centric Islands	6	0.557*** (0.162)
Impact on Tourism-centric Islands	7	0.474*** (0.132)
Impact on Tourism-centric Islands	8	0.519*** (0.115)
Impact on Tourism-centric Islands	9	0.401*** (0.112)
Impact on Tourism-centric Islands	10	0.144 (0.276)
Impact on Tourism-centric Islands	11	0.49*** (0.125)
Impact on Tourism-centric Islands	12	0.423** (0.183)
Other Islands Differential with Tourism-centric	0	-0.193 (0.171)
Other Islands Differential with Tourism-centric	1	-0.042 (0.12)
Other Islands Differential with Tourism-centric	2	-0.015 (0.088)
Other Islands Differential with Tourism-centric	3	-0.316*** (0.057)
Other Islands Differential with Tourism-centric	4	-0.447** (0.201)
Other Islands Differential with Tourism-centric	5	-0.503*** (0.107)
Other Islands Differential with Tourism-centric	6	-0.397** (0.159)
Other Islands Differential with Tourism-centric	7	-0.234 (0.152)
Other Islands Differential with Tourism-centric	8	-0.502*** (0.117)
Other Islands Differential with Tourism-centric	9	-0.609*** (0.1)
Other Islands Differential with Tourism-centric	10	-0.29 (0.248)
Other Islands Differential with Tourism-centric	11	-0.544*** (0.118)
Other Islands Differential with Tourism-centric	12	-0.537*** (0.175)

Table 19: IV regressions Results

Variable Name	Horizon Standard Error	Coefficient
Impact on Tourism-centric Islands	0	-0.01 (0.266)
Impact on Tourism-centric Islands	1	0.026 (0.271)
Impact on Tourism-centric Islands	2	0.2 (0.273)
Impact on Tourism-centric Islands	3	0.523* (0.28)
Impact on Tourism-centric Islands	4	0.693*** (0.265)
Impact on Tourism-centric Islands	5	0.585** (0.274)
Impact on Tourism-centric Islands	6	0.569** (0.274)
Impact on Tourism-centric Islands	7	0.41 (0.285)
Impact on Tourism-centric Islands	8	1.158*** (0.302)
Impact on Tourism-centric Islands	9	0.287 (0.315)
Impact on Tourism-centric Islands	10	0.359 (0.308)
Impact on Tourism-centric Islands	11	0.707** (0.317)
Impact on Tourism-centric Islands	12	0.456 (0.315)
Other Islands Differential with Tourism-centric	0	-0.004 (0.319)
Other Islands Differential with Tourism-centric	1	0.256 (0.326)
Other Islands Differential with Tourism-centric	2	-0.164 (0.323)
Other Islands Differential with Tourism-centric	3	-0.44 (0.325)
Other Islands Differential with Tourism-centric	4	-0.632** (0.307)
Other Islands Differential with Tourism-centric	5	-0.618* (0.317)
Other Islands Differential with Tourism-centric	6	-0.561* (0.316)
Other Islands Differential with Tourism-centric	7	-0.501 (0.329)
Other Islands Differential with Tourism-centric	8	-1.054*** (0.348)
Other Islands Differential with Tourism-centric	9	-0.928** (0.363)
Other Islands Differential with Tourism-centric	10	-0.426 (0.357)
Other Islands Differential with Tourism-centric	11	-0.923** (0.363)
Other Islands Differential with Tourism-centric	12	-0.744** (0.359)

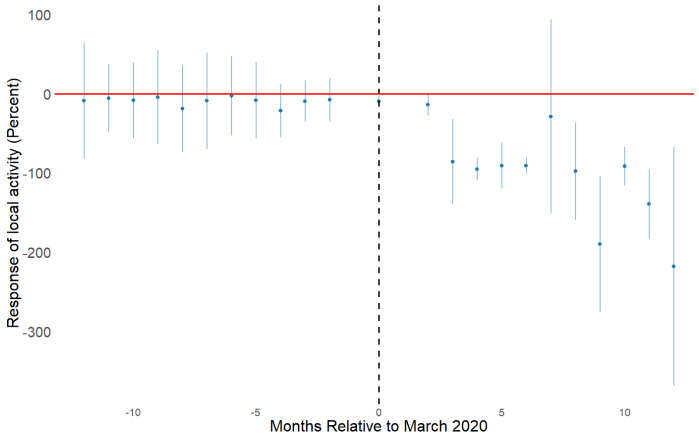
Table 20: IV First Stage F-statistics Across Horizons

Horizon	Impact on Tourism-centric Islands	Other Islands Differential with Tourism-centric
0	28.968	24.003
1	28.645	23.679
2	27.508	23.375
3	26.011	23.040
4	25.376	22.613
5	24.872	22.162
6	24.322	21.791
7	23.900	21.390
8	23.412	21.026
9	22.998	20.599
10	22.801	20.249
11	21.981	19.984
12	21.165	19.533

Table 21: Non Tourism-centric Islands Specification

Variable Name	Horizon	Coefficient Standard Error
Direct impact from Local Tourism	0	0.103 (0.221)
Direct impact from Local Tourism	1	0.072 (0.102)
Direct impact from Local Tourism	2	0.356*** (0.114)
Direct impact from Local Tourism	3	0.003 (0.24)
Direct impact from Local Tourism	4	0.032 (0.202)
Direct impact from Local Tourism	5	-0.184 (0.248)
Direct impact from Local Tourism	6	0.248 (0.352)
Direct impact from Local Tourism	7	0.219 (0.576)
Direct impact from Local Tourism	8	-0.048 (0.208)
Direct impact from Local Tourism	9	-0.164 (0.374)
Direct impact from Local Tourism	10	-0.107 (0.269)
Direct impact from Local Tourism	11	-0.097 (0.239)
Direct impact from Local Tourism	12	-0.18 (0.346)
Indirect Impact from Tourism-centric Islands	0	0.202 (0.387)
Indirect Impact from Tourism-centric Islands	1	0.11 (0.392)
Indirect Impact from Tourism-centric Islands	2	-0.337* (0.189)
Indirect Impact from Tourism-centric Islands	3	-0.097 (0.44)
Indirect Impact from Tourism-centric Islands	4	-0.013 (0.249)
Indirect Impact from Tourism-centric Islands	5	0.167 (0.236)
Indirect Impact from Tourism-centric Islands	6	-0.301* (0.175)
Indirect Impact from Tourism-centric Islands	7	0.032 (0.413)
Indirect Impact from Tourism-centric Islands	8	0.457** (0.213)
Indirect Impact from Tourism-centric Islands	9	-0.475 (0.315)
Indirect Impact from Tourism-centric Islands	10	0.243 (0.335)
Indirect Impact from Tourism-centric Islands	11	0.354 (0.337)
Indirect Impact from Tourism-centric Islands	12	0.087 (0.563)

Figure 40: Event Study: Response of local economy Around March 2020 (treated units: Sal and Boa Vista)



Source: IMF and authors' own calculation

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