Exchange Rate Elasticities of International Tourism and the Role of Dominant Currency Pricing*

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April 2022

Abstract

We estimate exchange rate elasticities of international tourism. We show that, in addition to the bilateral exchange rate, the exchange rate between the tourism origin country vis-à-vis the U.S. dollar is an important driver of tourism flows, indicating a strong role of U.S. dollar pricing. The U.S. dollar exchange rate is more important for tourism destination countries with higher U.S. dollar borrowing, pointing toward a complementarity between U.S. dollar pricing and financing. Country-specific dominant currencies (CSDCs) play only a minor role for the average country but are important for tourism-dependent countries and those with a high concentration of tourists. The importance of the U.S. dollar exchange rate represents a strong piece of evidence of dominant currency pricing (DCP) in the international trade of services and suggests that the benefits of exchange rate flexibility for tourism-dependent countries may be weaker than previously thought.

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We are grateful for the comments from Emine Boz, Camila Casas, Jorge Canales Kriljenko, Nicolas Magud, Sonia Munoz, and seminar participants at the IMF Western Hemisphere Department and Caribbean Regional Technical Assistance Center. The views expressed are those of the presenter and do not necessarily reflect those of the Federal Reserve Board of Governors or the Federal Reserve System. All errors of the paper are of the authors. Most recent version: here

I. Introduction

The extent to which a flexible exchange rate can act as a shock absorber is one of the most debated topics in the international trade literature. Under the traditional Mundell-Fleming framework, an exchange rate depreciation should have a positive effect on export volumes. This traditional Mundell-Fleming framework, however, has been called into question by the recent development of the dominant currency pricing (DCP) literature. The extensive use of the U.S. dollar in setting prices for international trade, regardless of the origin or the destination of trade flows, can mute the reaction of export volumes to exchange rate movements (Gopinath, 2015; Goldberg and Tille, 2008; Gopinath et al., 2020). While the DCP literature has presented strong evidence of U.S. dollar pricing in the international trade of goods, empirical evidence on the sensitivity of services flows to exchange rate movements is scarce.

In this paper, we zero in on one important service sector—international tourism—to shed light on the exchange rate elasticities of services trade. We provide strong evidence that both bilateral exchange rate movements and orthogonal U.S. dollar movements are important drivers of tourism flows. When the origin-country currency depreciates relative to the destination-country currency by 10 percent, bilateral tourism flows decline by 1.1 percent without controlling for how the origin-country currency fluctuates against the U.S. dollar. Once we control for the U.S. dollar exchange rate, the elasticity of the bilateral tourism flows is reduced to 0.7 percent in response to a 10 percent depreciation. At the same time, a 10 percent depreciation of the origin-country currency against the U.S. dollar reduces bilateral travel flows by 1.1 percent (controlling for the bilateral exchange rate movements). These results are robust across a wide range of countries regardless of exchange rate regimes.

The strong effect of the U.S. dollar in driving tourism demand is at odds with implications of the conventional literature in which exporters are assumed to set prices of exports in producer currencies (PCP), and export volumes respond positively to domestic currency depreciation. Rather, our results are consistent with findings of the DCP literature, suggesting that some tourism products are priced in the U.S. dollar regardless of the origin or the destination of tourists. For a small tourism-dependent economy, if a large share of its hotels set their prices in the U.S. dollar and these prices are sticky, foreign demand for hotels in this country (and exports of tourism in general) may decline if a strengthening of the U.S. dollar makes the hotels more expensive for potential foreign tourists, regardless of the movements of the bilateral exchange rates.

To further test this mechanism, we complement our tourism flow (quantity) analysis with an analysis of hotel prices. If hotel prices were largely set in domestic currencies, we would not expect hotel prices (in the local currency) to systematically change in the short term relative to the fluctuation of the exchange rate against the U.S. dollar. Using the large sample of hotel price data, we find that local hotel prices do increase strongly when the domestic currency depreciates against the U.S. dollar. We estimate an average pass-through from the U.S. dollar movements to local hotel prices of 0.4, indicating strong U.S. dollar pricing for hotels across the world.

The average price and quantity elasticities mask significant heterogeneity across countries. One potential explanation for the cross-country variation in DCP is the complementarities between U.S. dollar pricing and financing (Gopinath and Stein, 2020). When companies borrow in the U.S. dollar, pricing their exports in the dollar provides a natural hedge against movements in the dollar exchange rate (Casas, Meleshchuk, and Timmer, 2020). We test for those complementarities by exploiting variation in the degree of U.S. dollar indebtedness across countries. Our results show that the role of the U.S. dollar is significantly stronger for countries where a relatively large share of corporate borrowing is in the U.S. dollar.

Another potential explanation for the cross-country variation may stem from the country- or region-specific characteristics of the composition of foreign tourists. While countries in the Caribbean may choose to invoice their hotels in the U.S. dollar given the proximity and the large share of U.S. tourists for the local markets, small tourism-dependent countries close to Europe may choose to use the euro. To capture this effect, for each tourism destination country, we define a "country-specific dominant currency," which we dub CSDC, as the currency of the country where the largest share of tourists resides and test for its importance in driving tourism flows. On average, we do not find strong evidence that the CSDC plays a large role in driving tourism flows, controlling for other exchange rate movements. However, the role of the CSDC gains weight for destination countries where tourist arrivals are highly concentrated and for those that have relatively high tourism reliance. These results suggest that the composition and intensity of tourist arrivals may affect the invoicing decisions by local tourism sectors with sobering implications for the role of the exchange rate as a shock absorber.

The methodology in estimating exchange rate elasticities at the country-pair level follows closely the DCP literature (i.e., Gopinath et al., 2020). Instead of focusing solely on the movements of bilateral exchange rates, we estimate the role of the U.S. dollar (and other potential dominant currencies) regardless of the tourist source or destination countries. By using bilateral tourist arrival data, we can control for time-varying destination-specific shocks in the regressions and exploit the heterogeneity in exchange rate movements among different currency pairs that may affect the volume of tourist arrivals.

A comparison with the existing DCP literature can help put our analysis into perspective. For international trade of goods, Gopinath et al. (2020) estimated the bilateral exchange rate elasticity to be 0.03 and the U.S. dollar elasticity to be 0.19. Our estimated elasticity for international tourism is 0.07 for the bilateral exchange rate and 0.11 for the U.S. dollar exchange rate. In other words, the U.S. dollar exchange rate plays a quantitatively more important role than the bilateral exchange rate for both international trade of goods and tourism, while DCP, on average, is stronger for international trade of goods than for tourism.

Our findings have important implications for small tourism-dependent economies. Many of these countries are among the hardest hit by the COVID-19 pandemic because of their heavy reliance on exports of tourism (Milesi-Ferretti, 2021). Understanding how exchange rate movements are driving tourism flows is particularly important, as these economies have limited policy options to regain competitiveness in the post-pandemic market.

In the Caribbean, for example, the share of tourism ranges between 50 and 90 percent of the overall economy for the tourism-dependent economies in the region. While many of these countries adopt a fixed exchange rate with currencies pegged to the U.S. dollar, the movements between the dollar vis-à-vis the currencies of other major tourist source countries (e.g., Canada, the European Union, and the United Kingdom.) could have a direct impact on their competitiveness, both within the Caribbean and versus destinations in other regions that provide similar tourism products. A strengthening of the U.S. dollar could render the currency peggers in the Caribbean less attractive for non-U.S. tourists, other things being equal. Even for countries with a flexible exchange rate (e.g., the Dominican Republic and Jamaica), a depreciation of the domestic currency vis-à-vis the dollar does not necessarily improve competitiveness if their accommodation services, which typically account for the lion's share of the domestic value added of the tourism industry, are invoiced in the dollar and do not respond to the domestic currency depreciation.

By using high-quality data on both prices and quantities, our work also provides a unique example to disentangle the various currency pairs in analyzing exchange rate elasticities. In comparison, comprehensive granular cross-country data on both prices and quantities are often unavailable in the international trade literature, which is why many papers have to focus on individual countries (e.g., Gopinath and Rigobon, 2008; Fitzgerald and Haller, 2012). Even when cross-country quantity data are available, the heterogeneity in international trade of goods makes cross-country or sector comparisons difficult, forcing researchers to focus on individual goods instead (e.g., Chen and Juvenal, 2016). On the other hand, the hotel price and tourist arrival (by country of origin) data that we use in this paper allow us to zero in on international tourism, which arguably represents a homogenous product in international trade.

Our findings also fill a gap in the economics literature of international tourism, which has focused mostly on the bilateral exchange rate movements between only two countries and their effect on tourist flows. For example, Gray (1966) and Vilasuso and Menz (1998) studied the income and exchange rate elasticities of the demand for travel between the United States and Canada. Chandra, Head, and Tappata (2014) analyzed the decision to travel across international borders on Canada–U.S. travel using microlevel data and showed that an appreciation of the home currency increases outbound travel. Similarly, Neiman and Swagel (2009) found that a stronger dollar (a real depreciation of the currency of the origin country) leads to less travel to the United States. To our best knowledge, our paper is the first in the literature to attempt to quantify exchange rate elasticities in a setting with multiple exchange rate pairs.

Our work also contributes to the growing literature on dominant currencies. The empirical work by Goldberg and Tille (2008) and Gopinath (2015) first found that international trade tends to be invoiced in a small number of "dominant currencies," especially the U.S. dollar. Gopinath and Rigobon (2008) and Fitzgerald and Haller (2012) further demonstrated that international trade prices tend to be rigid in such currencies. The DCP framework proposed by Gopinath et al. (2020) demonstrates that the extensive use of a third country's currency (such as the U.S. dollar) in setting prices for international trade, regardless of the origin or destination of trade flows, can dampen the short-term reaction of export volumes to exchange rate movements. We contribute to this literature by providing evidence that DCP is prevalent not only in goods trade, but also in international tourism. And our results indicate that the benefits of domestic currency depreciation (or switching to a flexible exchange rate regime) in order to boost tourism exports may be weaker than previously thought under the traditional Mundell-Fleming framework.

The rest of the paper is organized as follows. Section II introduces the data used. In Section III, we present evidence of DCP in the prices of tourism by analyzing the elasticity of hotel prices with respect to exchange rate movements. Section IV introduces the concept of CSDC and quantifies the elasticity of tourist arrivals with respect to movements of exchange rates between various currency pairs. In Section V, we draw the connection between DCP and dominant currency financing (DCF). In Section VI, we present the evidence of CSDCs. Section VII concludes.

II. Data

For the quantity of international tourism, we use the bilateral data from the United Nations World Tourism Organization (UNWTO). The data are based on the annual outbound tourism data (trips abroad by residents to destination countries) for the period of 1995 to 2019. UNWTO compiles this information using data provided by each destination country. The data set includes various types of outbound tourism, such as arrivals of nonresident *tourists at national borders* by nationality and by country of residence, arrivals of nonresident *visitors at national borders* by nationality and by country of residence, arrivals of nonresident *tourists in hotels and similar establishments* by nationality and by country of residence, and arrivals of nonresident *tourists in all types of accommodation establishments* by nationality and by country of residence. Due to data completeness and appropriateness for our analysis, we use the arrivals of nonresident *tourists at national borders by country of residence* for our main analysis. Hence, we only consider tourists and not business travelers, as the latter are likely to be less responsive to exchange rate movements. We also use country of residence instead of nationality as the relevant metric, as the former is more representative of the demand side of international tourism. Our final data set covers 181 destination and 200 origin countries from 1995 until 2019 at an annual frequency.

For the price of international tourism, we use the hotel price provided by Tripadvisor. The data set is based on the annual average daily rates (in U.S. dollar) of 6,500 hotels in 61 countries for 2014 to 2019.[3] In our main analysis, we aggregate to the country-year level. However, the Tripadvisor star ratings of the hotels also allow us to split the sample based on the ratings to have a more granular analysis on the exchange rate elasticities, as the higher-rated hotels usually correspond to the more expensive ones and possibly those with more foreign guests.

The U.S. dollar debt data are taken from Adler et al. (2020). The overall measure is available for 36 major advanced economies and emerging market economies for 2001 to 2019. The corporate foreign currency exposure is constructed by adding foreign currency corporate debt securities (from the Bank for International Settlements (BIS) International Debt Statistics), cross-border foreign currency loans to nonfinancial firms (from BIS Locational Banking Statistics), and local foreign currency loans to nonfinancial

[3] Laframboise et al. (2014), in collaborating with Tripadvisor, use the company's hotel price data to construct a "Week at the Beach" index since 2015. The index tracks the nominal cost of a one-week beach holiday in a tourism destination (Laframboise et al., 2014). The index comprises a composite of the average price of hotels with a three to four "bubble" rating from Tripadvisor together with more than 80 million crowdsourced data points on prices for meals, taxis, and beverages (water, coffee, and beer). In this paper, we use the original Tripadvisor hotel rates data.

firms (from the International Monetary Fund (IMF) Monetary and Financial Statistics). Finally, we use the exchange rate data from the IMF International Financial Statistics.

III. Evidence of Dominant Currency Pricing in Hotel Prices

The cost of accommodation is often one of the most important factors for tourists when selecting international travel destinations from a group of countries that provide similar tourism products. Unlike the cost of airfare, which depends largely on global factors such as the oil price and profit margins of international airlines, the cost of accommodation depends largely on local factors such as local labor and utility costs, insurance expenses, and taxation. Which currency (or currencies) local hotels choose to invoice their services also matters, as the choice affects the actual cost for tourists via the exchange rate channel. If hotel prices are completely invoiced in destination-country currency (or PCP), one would expect no correlation between the U.S. dollar exchange rate and hotel prices in local currency. Conversely, if hotel prices are invoiced in a foreign currency—say, the U.S. dollar—and are sticky, there should be a full pass-through from the fluctuations of the U.S. dollar exchange rate into domestic hotel prices.

In reality, the choice of invoicing currency at the country level can be a mix of the tourist destination (tourism exporting country) currency—PCP, one or more dominant currencies—DCP, and even the currency of the tourist origin (tourism importing country) country—the so-called local currency pricing. To quantify the elasticity of hotel prices with respect to exchange rate movements of different currency pairs, we estimate the following pass-through regression:

$$\Delta HotelPrice_{i,t} = \alpha + \alpha_i + \alpha_t + \beta_1 \Delta FX_{i,t} + v_{i,t},$$

where $\Delta HotelPrice_{c,t}$ is the change in the log hotel price of hotels in country i in year t in destination-country currency, $\Delta FX_{i,t}$ is the change in the log of destination-country currency units relative to the U.S. dollar (a positive value indicates a depreciation against the dollar), and α_i and α_t represent country and year fixed effects, respectively. If all hotels were priced in the domestic currency (PCP) and sticky, a depreciation of the domestic currency is not expected to affect hotel prices in domestic currency ($\beta_1 = 0$). Conversely, if hotel prices were invoiced in the U.S. dollar (DCP), a domestic depreciation against the dollar would lead to full pass-through of the exchange rate movement to domestic hotel prices ($\beta_1 = 1$).

The results of the above regression are presented in Table 1. Column (1) shows the results for all hotels without any fixed effects. The estimated coefficient of β_1 is positive (0.45) and statistically significant, indicating that a domestic depreciation indeed increases hotel prices in domestic currency. The fact that the coefficient is statistically different from zero suggests that at least some hotel prices are invoiced and sticky in the dollar. One caveat could be that hotel prices are increased in general in times when the U.S. dollar appreciates. To control for this possibility, we include year fixed effects in the specification. One other concern could be that country-specific factors (e.g., the growth rate of the country over our time period) are correlated with the movements in the U.S. dollar and could lead to a spurious correlation between U.S. dollar movements and hotel prices. To address this concern, we also estimate a within-country regression by including country fixed effects. All results hold and remain virtually unchanged when country, year, and both fixed effects are considered (columns 2 through 4, respectively).

In columns (5) through (7), the sample is split according to the Tripadvisor star ratings of the hotels: four- to five-star hotels in column (5), three- to four-star hotels in column (6), and one- to three-star hotels in column (7). The pass-through coefficient is the largest for the one- to three-star hotels, followed by that of the four- to five-star and three- to four-star hotels. Because a larger coefficient can be interpreted as representing stronger evidence of DCP, the results suggest that medium-quality hotels are most likely to be priced in domestic currency, while DCP seems to be most common among one- to three-star hotels. The standard error in column (7), however, is relatively large, and the coefficient therefore is not statistically different from that in column (5) or (6). In all columns, the hypothesis of $\beta_1 = 1$, or full DCP, can also be rejected.

In Figure 1, we present a binscatter plot between the bilateral percentage depreciation of destination-country currency against the dollar and the percentage change in hotel prices in domestic currency. The positive relationship indicates that hotel prices in the domestic currency increase when the domestic currency depreciates, which again provides strong evidence against full PCP in the hotel sector. On the other hand, the linearly fitted line of the positive relationship is significantly flatter than a 45 degree, indicating that the sample does not imply a full DCP either.

Figures 2 through 4 demonstrate the heterogeneity in the elasticity of hotel prices with respect to exchange rate movements at the country level. We estimate a time-series regression for each country in the sample separately and regress the change in the log hotel price on the change in the log exchange rate relative to the U.S. dollar without country fixed effects. The estimated β_1 coefficient thus reflects the country-specific elasticity, which ranges from negative 0.5 to positive 3.2 (Figure 2). As shown in Figure 3, while there is large heterogeneity across countries, the most frequent observations center around β_1 of 1, or full DCP, and the second most frequent observations center around β_1 of 0. This bimodal distribution suggests that, at the country level, there can be a strong concentration around full DCP or full PCP depending on country-specific circumstances. The European countries, for instance, would have little incentive to invoice their hotels in a currency other than the euro, given the large share of tourists within the euro area. This result may also explain why the elasticity does not vary significantly across star rating groups.

Finally, we sort the country-specific elasticity by the size of their gross domestic product (GDP) in Figure 4. Although the overall sample is skewed toward small tourism-dependent economies, larger countries (especially those in the euro area) tend to have a smaller coefficient, an indication of weaker DCP in the prices of their tourism sector.

IV. Evidence of Dominant Currency Pricing in Tourist Arrivals

In this section, we use the bilateral tourist arrival data from the UNWTO to quantify the elasticity of the volume of tourist arrivals with respect to exchange rate movements. The data comprises 181 destination and 200 origin countries from 1995 until 2019. Using bilateral tourist arrival data allows us to control for time-varying destination-specific shocks in the regression, so that we can exploit the heterogeneity in exchange rate movements among different currency pairs that may affect the volume of tourist arrivals and shed light on the effect of DCP on the quantity of international tourism.

To quantify the effect of exchange rate movements on tourist arrivals, we estimate the following regression:

$$\Delta Arrival_{i,j,t} = \alpha + \alpha_t + \alpha_{i,j} + \beta_1 \Delta FX_{i,j,t} + \beta_2 \Delta USD_{j,t} + \beta_3 \Delta DFX_{i,j,t} + v_{i,j,t},$$

where $\Delta Arrival_{i,j,t}$ is the yearly difference in the log number of tourists arriving at destination country *i* from origin country *j* between year *t-1* and *t*. α_t are year fixed effects that capture all time-variant global shocks, such as the movement of the U.S. dollar against all countries. $\alpha_{i,j}$ are origin-country times destination-country fixed effects that control for any time-invariant factors of the origin-destination country pair that is typically included in gravity model analysis, such as the distance between the two countries. $\Delta FX_{i,j,t}$ is the yearly difference between the log of the destination-country currency relative to the origin-country currency (e.g., the Fijian dollar relative to the euro for tourists arriving from Germany to Fiji), where a positive value reflects a depreciation of the origin country relative to the destination country. $\Delta USD_{j,t}$ captures the movement of the origin-country currency relative to the U.S. dollar (e.g., the euro relative to the U.S. dollar for German tourists visiting Fiji). $\Delta DFX_{i,j,t}$ captures the movement in the origin-country currency relative to the dominant currency of destination country *i*. The CSDC is defined as the currency of the country where the largest share of tourists originates from to the given destination country. In the case of Fiji, the CSDC (and dominant currency country) is the Australian dollar (and Australia). Standard errors are clustered at the country-pair level.

This regression equation is similar to that in Gopinath et al. (2020), which regresses import quantities on the exchange rate movement of the exporter relative to the U.S. dollar and the bilateral exchange rate.[4] However, our regression specification has an additional term $\Delta DFX_{j,t}$ given that there may exist multiple dominant currencies in the global tourism market because tourism products can be region specific, while the U.S. dollar is perceived as the only dominant currency in international trade of goods.

We first present the result for each currency pair separately in Table 2. Column (1) shows the results for the bilateral exchange rate movements, $\Delta FX_{i,j,t}$. A bilateral depreciation of the origin country relative to the destination country is associated with a decline in tourist arrivals from the given origin country to the given destination country, consistent with a downward-sloping demand curve and PCP, as one would expect under the standard Mundell-Fleming framwork. If all international travel was priced in destination-country currency, a bilateral depreciation in origin-country currency increases prices for travelers in their own currency. Quantatitatively, a 10 percent depreciation of origin-country currency relative to destination-country currency is associated with a 1.1 percent decline in the volume of tourists.

Column (2) shows the result for the U.S. dollar exchange rate, $\Delta USD_{j,t}$. The estimated elasticity coefficient is also negative, indicating that when the origin-country currency depreciates relative to the U.S. dollar, travel from origin country *j* to destination country *i* declines, even when $\Delta USD_{j,t}$ is not directly related to destination country *i*. This result can be interpreted as an indication of DCP. Namely, if hotel prices are set in the U.S. dollar in destination-country *i* in year t-1 and are sticky between *t* and *t-1*, a depreciation of the origin-country currency relative to the U.S. dollar increases hotel prices for tourists and therefore reduces demand, or tourism flows, from origin-country *j* to destination-country *i*. Quantitatively, a 10 percent depreciation of the origin-country currency relative to the U.S. dollar reduces travel flows by 1.9 percent.

[4] Gopinath, Li, and Meleshchuk (2020) use the European Union data to analyze exchange rate elasticities for tourism.

Column (3) shows the results for the CSDC, $\Delta DFX_{i,j,t}$. The dominant currency is defined as the change in the log exchange rate between the dominant currency of country i and origin country i (e.g., the euro against the Australian dollar for German tourists visiting Fiji). The coefficient is also negative but smaller in absolute values relative to that in column (2) for the U.S. dollar exchange rate. A 10 percent depreciation of the origin-country currency relative to the CSDC reduces travel by around 1 percent.

The three exchange rates are naturally highly correlated. In fact, for many tourism destinations, especially those in the Caribbean, the United States is their CSDC country, in which case $\Delta DFX_{i,j,t}$ and $\Delta USD_{j,t}$ are perfectly collinear. We therefore include all three exchange rates in the same regression. The results are shown in column (4) of Table 2 and graphically in Figure 5, which indicate that the effect of CSDC completely vanishes once one controls for the U.S. dollar exchange rate. Both the U.S. dollar exchange rate and the bilateral exchange rate between origin country and destination country remain statistically and equally important.

While our results are already saturated with various fixed effects, we cannot rule out that the results may be driven by other non-exchange-rate-related factors such as changes in the macroeconomic conditions in destination countries. We therefore include GDP growth, financial integration, GDP per capita, trade integration, and the size of the economy as additional controls in the regression. The results are shown in column (5) and are qualitatively unchanged from the previous specifications. However, the sample is significantly changed as a result of missing control variables. When we restrict our sample to countries where both tourism and control variables are available, the results remain largely unchanged (column 6 of Table 2).

Although our regressions control for both time and country fixed effects that would account for any time-invariant country characteristics and global shocks that would lower overall demand, the regressions do not control for country-specific time-varying shocks, such as a negative demand shock, as they could be collinear with the movements in the exchange rates. We therefore estimate the following equation:

$$\Delta Arrival_{i,j,t} = \alpha + \alpha_{i,t} + \alpha_{i,j} + \beta_1 \Delta e + v_{i,j,t},$$

where e is either ΔF, ΔUS or ΔDF, $\alpha_{i,t}$ are destination country times year fixed effects that can capture all time-variant and time-invariant destination-country-specific shocks. As these regressions include destination country times time fixed effects, the average change of tourist arrivals to a destination country across all origin countries and other destination-specific time-varying factors, such as the change in the price level, are controlled for. Therefore, potential confounding factors that would lead to a depreciation of the currency and reduce travel demand, such as social-political uncertainty or inflation, will not be driving the results.

This regression specification cannot be estimated as a horse-race regression between the bilateral exchange rate and the U.S. dollar, as $\Delta FX_{i,j,t}$ and $\Delta USD_{j,t}$ would be perfectly collinear after including destination-country times year fixed effects. The movement between the origin-country currency against the U.S. dollar is a linear combination of the bilateral movement between destination country and origin country and the U.S. dollar movement against the destination country (which is absorbed by destination-country times year fixed effect).

The results corroborate our previous finding that the U.S. dollar exchange rate (between the origin-country currency and the U.S. dollar) remains important, especially when compared with the bilateral exchange rate and the CSDC exchange rate (Table 3).

V. Dominant Currency Financing

Having presented the evidence of DCP in both prices and quantities of international tourism, we investigate in this section the complementarities between pricing (DCP) and financing (DCF), which may explain the important role of the U.S. dollar in tourism regardless of the tourist origin and destination countries, similar to the findings of Gopinath and Stein (2020) and Adler et al. (2020). The fact that the U.S. dollar exchange rate tends to be more important than the CSDC exchange rate, even for countries for international travel, suggests that factors unique to the greenback may be at play. One potential hypothesis put forward in the literature is that U.S. dollar pricing and financing complement each other. For example, Casas, Meleshchuk, and Timmer (2020) show that exporting in the U.S. dollar provides a natural hedge against a depreciation for firms borrowing in the U.S. dollar. Given the uniquely important role of the dollar in international finance—especially for firms in emerging market and developing countries, including those in the tourism industry—it is conceivable that the need to service the dollar debt gives tourism exporters incentives to price their products in the dollar.

We test whether tourism destinations that borrow more in the U.S. dollar are more sensitive to movements of the dollar exchange rate. We start by investigating the pricing response of hotels in response to the U.S. dollar exchange rate as a function of U.S. dollar borrowing, followed by quantity regressions where we investigate whether tourism arrivals react differently to the U.S. dollar exchange rate when the destination countries have more U.S. dollar debt. Unfortunately, we do not have data on U.S. dollar borrowing of firms. The best approximation we have is the data on U.S. dollar borrowing of nonfinancial corporates as compiled by Adler et al. (2020). While we are aware that U.S.

dollar borrowing of nonfinancial corpoartes is not a perfect proxy of U.S. dollar borrowing by hotels, the imperfect proxy is unlikely to bias our results in a systematic way and instead, if anything, attenuates our effects.

Prices

We estimate a similar equation as in section II but introduce an additional interaction term:

$$\Delta HotelPrice_{i,t} = \alpha + \alpha_i + \alpha_t + \beta_1 \Delta FX_{i,t} + \beta_2 \Delta FX_{i,t} * USD\ Borrowing_i + v_{i,t},$$

where USD $\text{Borrowing}_\text{i}$ is the share of dollar borrowing by country i, as described in Adler et al. (2020). U.S. dollar borrowing is defined in various ways, as explained below, but is time invariant, making it collinear with the country fixed effect α_i, averting us from including USD $\text{Borrowing}_\text{i}$ as a level term in the regression equation. Our main coefficient of interest is β_2, which reflects the additionl effect of the exchange rate movement when countries have more U.S. dollar borrowing.

If the complementarity between U.S. dollar financing and pricing exists in the tourism industry, one would expect to see more dollar invoicing of hotel prices in countries with higher U.S. dollar debt. When a country's exchange rate depreciates, the servicing cost of its U.S. dollar debt in local currency increases. If the debtor (such as the hotel) does not not have offsetting revenues in the dollar, the depreciation will lead to a negative net worth impact. However, if the revenue of the debtor is also in the dollar (by invoicing hotel services in the dollar), the higher revenues in local currency can provide a hedge against the increase in debt repayments in local currency terms (Casas, Meleshchuk, and Timmer, 2020).

As U.S. dollar pricing would be reflected in a positive coefficient for $\Delta FX_{i,t}$, we would expect β_2 to be positive as well, as the effect would be stronger in countries with more U.S. dollar borrowing. The results are shown in Table 4. Column (1) shows the results for all hotels, while columns (2) through (4) split by hotel rating groups. The coefficient of interest, β_2, is indeed positive and statistically significant in columns (1) through (3), suggesting strong complementarities between DCP and financing for higher-level hotels. For lower-rated hotels, the interaction between the share of U.S. dollar borrowing and the exchange rate is insignificant, potentially due to their inability to borrow in U.S. dollars.

The results can also be demonstrated in a binscatter in Figure 6. As for the pooled country sample, we plot a binscatter of the percent change in local currency hotel prices on the percent depreciation of destination country relative to the U.S. dollar, and we split the sample between destination countries that borrow heavily in U.S. dollar and those that do not. The high dollar-borrowing countries are displayed in red diamonds, and the low dollar-borrowing countries are shown as red circles. The positive correlation between the depreciation of the exchange rate and the rise in domestic currency hotel prices is entirely driven by firms that borrow heavily in the dollar. When we compare the slope of countries that do not borrow much in the dollar, the correlation is much stronger for high dollar-borrowing countries than for low dollar-borrowing ones.

Quantities

We now test whether complementarities between DCF and DCP also affect the tourist arrivals. We estimate the following regression:

$$\Delta Arrival_{i,j,t} = \alpha + \alpha_t + \alpha_{i,j} + \beta_1 \Delta FX_{i,j,t} + \beta_2 \Delta USD_{j,t} + \beta_3 \Delta DFX_{i,j,t} + \beta_4 \Delta FX_{i,j,t} * USD\ Borrowing_i + \beta_5 \Delta USD_{j,t} * USD\ Borrowing_i + \beta_6 \Delta DFX_{i,j,t} * USD\ Borrowing_i + v_{i,j,t}.$$

The coefficients of interest are $\beta_4$through β_6. They indicate to which exchange rate movements countries with more foreign currency borrowing will be more sensitive. Column (1) of Table 5 re-estimates our baseline equation but with the reduced country sample for which we have U.S. dollar borrowing data available. In this reduced sample, all three coefficients are negative and statistically significant, with the U.S. dollar playing quantitatively the largest role. In columns (2) through (9), we use different definitions of U.S. dollar borrowing and run the regressions with and without interacted controls, in which we interact the three exchange rates with various control of the destination country (GDP growth, financial integration, GDP per capita, trade integration, and log GDP).

In all regressions, we can observe that the U.S. dollar exchange rate becomes more important for countries that borrow more in the dollar, mirroring the evidence for hotel prices in the previous section. In contrast, the bilateral exchange rate becomes less important for these countries, whereas the dominant exchange rate effect is unchanged as a function of U.S. dollar borrowing.

Figure 7 displays the results graphically by calculating the effect of the bilateral and the U.S. dollar exchange rate on tourist arrivals for high and low U.S. dollar borrowing countries. The red bars show the differential effect of the U.S. dollar exchange rate on tourism arrivals, differentiating between high dollar-borrowing countries (shaded) and low dollar-borrowing countries (solid). The effect of the U.S. dollar exchange rate is significantly stronger and almost twice as large quantitatively in high dollar-borrowing countries. The blue bars show the effects of the bilateral exchange rate. The opposite pattern can be seen here. The effect of the bilateral exchange rate is significantly stronger when countries do not borrow heavily in the U.S. dollar (solid bar), with a much more nuanced effect for countries that borrow heavily in the dollar.

VI. Country-Specific Dominant Currencies

So far, we have established that the U.S. dollar plays a special role in the pricing of tourism, likely due to its importance as a financing currency. In contrast, the currency of the country where most tourists originate from, or CSDC, on average, plays a minor role if the currency is not the U.S. dollar. Figure 8 displays the CSDC for selected countries. For instance, the United States is the dominant currency country for Canada and Mexico, while the CSDC for the United States is the Canadian dollar. In many African countries, the dominant currency country is often France or Germany, and the euro is therefore the CSDC. China accounts for the largest share of tourists for many Asia and Pacific countries, including Australia, while Australia is the dominant currency country for New Zealand and most Pacific Island countries.

When there is a high degree of concentration of foreign tourists, hotels may have incentives to set prices in the CSDC to stabilize the price for their largest markets. Figure 9 shows the share of tourists arriving from the CSDC country for each destination country. Taking together Figures 8 and 9, we can see that, for example, the largest share of tourists to New Zealand is from Australia, and this share is relatively large (40 percent of New Zealand's total tourist arrivals). The large share of tourists from Australia may give New Zealand hotels an incentive to invoice their rates in the Australian dollar. A strengthening of the Australian dollar relative to other currencies would therefore increase the costs for tourists from other countries to New Zealand. In contrast, while the largest share of tourists to Australia is from China, this share is relatively small (less than 20 percent), hence the incentives for Australian hotels to price their rates in the renminbi may be low.

To test whether the CSDC indeed becomes more important with the market share of the dominant currency country, we estimate the following regression:

$$\Delta Arrival_{i,j,t} = \alpha + \alpha_t + \alpha_{i,j} + \beta_1 \Delta FX_{i,j,t} + \beta_2 \Delta USD_{j,t} + \beta_3 \Delta DFX_{i,j,t} + \beta_4 \Delta FX_{i,j,t} * Concentration_i + \beta_5 \Delta USD_{j,t} * Concentration_i + \beta_6 \Delta DFX_{i,j,t} * Concentration_i + v_{i,j,t},$$

where $Concentration_i$ is the share of tourists arriving from the CSDC country. As $Concentration_i$ is not time varying, we do not need to include the term itself in the regression is it collinear with the country-pair fixed effect. Column (1) of Table 6 shows the results. Consistent with the intution, the importance of the CSDC increases with the degree of concentration of tourists for destination countries, while the importance of the bilateral exchange rate decreases. In column (2), we replace the share of tourists arriving from the CSDC country with a dummy that is one if the share of tourists arriving from the dominant currency country is high. The results are qualitatively the same and are illustrated in Figure 1. The solid bars reflect the role of the three different exchange rates when the concentration of tourist arrivals is high. The U.S. dollar and the exchange rate of the dominant country play a large and quantitively similar role, while the the bilateral exchange rate becomes irrelevant. This result further highlights that, when tourist arrivals are highly concentrated, tourism destination countries can do little to improve competitiveness via a domestic exchange rate depreciation. On the other hand, in countries where tourist arrivals are not highly concentrated, the bilateral exchange rate can still act as a shock absorber. Columns (3) and (4) show that the results hold when we exclude the United States as a dominant country, and column (5) shows that the results are robust when including controls.

Column (6) replaces the concentration measure with a measure of tourist reliance, defined as the annual tourist arrivals as a share of the destination-country population. The tourist reliance variable is shown in a map in Figure 10. Similar to the concentration measures, countries with higher tourist reliance (or a larger size of tourists relative to the local population), including many tourism-dependent economies in the Caribbean and the Pacific, are more sensitive to changes in the exchange rate of the CSDC.

In Table 7, we split the sample by dominant countries to assess whether there exist currencies other than the U.S. dollar that play an important role in their respective segments of the international tourism markets. We find that in countries where the dominant currency country is the United Kingdom and Russia, the pound and the ruble do play a statistically significant role, even for tourists originating from other countries (Table 7). However, the sample size is relatively small for the pound and the ruble markets, while currencies such as the Australian dollar, the euro, and the renminbi do not exhibit a statistically significant effect for tourist flows in their respective markets. This result again confirms the uniquely important role of the U.S. dollar in international tourism.

Finally, we discuss the role of exchange rate regimes. One may suspect that the results are driven by tourism-dependent countries with pegs, where significant pricing takes place in dollars. In Table 8, we re-estimate our baseline equation, interacting all three exchange rate movements with a dummy that takes the value for various exchange rate regimes: (i) a peg between the destination and origin country, (ii) a peg between the destination country and the U.S. dollar, and (iii) a peg between the origin country and the U.S. dollar. The interaction term illustrates the differential effect of pegged countries relative to non-pegged countries. In all three columns, all interaction effects are statistically insignificant, indicating that pegged countries do not respond differentially to exchange rate movements than non-pegged countries in cases in which we can estimate the differential elasticity.

More specifically, in column (1), we test how tourist flows are differentially affected by exchange rate movements if two countries are pegged to each other—for example, within the euro area. Of course, we cannot test the exchange rate elasticity for bilateral exchange rate movements, as the exchange rate is, by definition, fixed. However, we can test the differential response of a euro-area country relative to a non-euro-area country in response to movements in the U.S. dollar exchange rate or the dominant exchange rate. For instance, in the case of tourist flows to Ireland, we compare the elasticity of German and Canadian travel in response to movements in the U.S. dollar or the British pound (the dominant currency for Ireland) against the euro and the Canadian dollar. We do not find evidence that pegged countries (in this case, Germany) respond differentially to exchange rate movements than non-pegged countries (Canada), as shown by the insignificant interaction terms. In column (2), we define a peg as a dummy that is equal to one if the destination country is pegged against the U.S. dollar, as is—for example—the case for many Caribbean countries. In this case, the bilateral exchange rate movement between any origin country and destination country for which the peg dummy is one is perfectly collinear with the movement in the U.S. dollar. For instance, the movement in the euro against the U.S. dollar is the same as the euro against the Bahamian dollar (which is pegged to the U.S. dollar). This collinearity prevents us from estimating the U.S. dollar exchange rate elasticity separately from the bilateral exchange rate elasticity for this set of countries. However, we can test whether tourism is more or less elastic to U.S. dollar or dominant currency movements toward countries that have a peg with the U.S. dollar. We do not find evidence in favor of a differential elasticity. In column (3), we define a peg as a dummy that is equal to one for an origin country that has a pegged exchange rate to the U.S. dollar (e.g., travel flows from Hong Kong, which has a peg against the U.S. dollar). As for the other peggers, we do not find evidence that these countries exhibit a differential exchange rate elasticity than countries that are not pegged to the U.S. dollar.

VII. Conclusion

In this paper, we complement the DCP literature by providing evidence of DCP in international tourism. Contrary to the conventional wisdom that international trade of services is usually invoiced in exporting-country currencies and that a domestic depreciation is beneficial to export volumes, our analysis points out that the benefits of exchange rate flexibility in international tourism are damped by the effect of DCP. The U.S. dollar plays a particularly important role even in countries where the largest share of foreign tourist origins are from non-U.S. countries. To the extent that hotels may choose to invoice their services in the U.S. dollar or other foreign currencies, as indicated by the partial pass-through of dollar exchange rate movements to hotel prices, a general strengthening of the dollar could have a contractionary effect on tourist arrivals for destination countries with strong U.S. dollar pricing. Quantitatively, a 1 percent U.S. dollar appreciation against all other currencies can be associated with a 0.12 percent decline within a year in tourism flows.

While the extent of DCP varies across countries partly as a result of country-specific characteristics of the tourism industry, in general, there is strong complementarity between DCP and DCF. We show that in countries with higher U.S. dollar borrowing, hotel prices in domestic currency are extremely sensitive to fluctuations in the dollar exchange rate, whereas in countries with low U.S. dollar borrowing, changes in hotel prices are orthogonal to currency movements relative to the U.S. dollar. Moreover, in low U.S. dollar borrowing countries, the bilateral exchange rate dominates the dollar exchange rate in driving tourist flows, which is the opposite for high dollar-borrowing countries. These results are consistent with the literature on DCP and DCF.

Overall, our results indicate that the widespread DCP in the international tourism industry can weaken the response of tourism exports to exchange rate movements. For small tourism-dependent economies, the benefits of exchange rate flexibility may be muted if local hotels choose to invoice services in a foreign currency, either as a hedge against foreign borrowing costs or to match the preferences of foreign tourists. For countries where the U.S. dollar is the common invoicing currency, the expected tightening of U.S. monetary policy would imply a strengthening of the dollar over the medium term and an increase in the hotel prices measured in local currencies and currencies of other tourist origin countries. To mitigate such an adverse effect on tourism exports, policymakers may need to consider more supportive macroeconomic policies as local tourism sectors recover from the COVID-19 pandemic. Over the longer run, despite the limited effect of exchange rate flexibility on export volumes due to DCP, countries can still improve competitiveness through structural reforms such as reducing the unit labor costs by enhancing labor market flexibility and improving domestic access to finance, which in turn may reduce the tourism sector's reliance on foreign borrowing and therefore strengthen the benefits of exchange rate flexibility as a shock absorber.

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Table 1: Hotel Price Pass-Through Regression

	Δ Hotel Price in Local Currency						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
% Depreciation against USD	0.452***	0.460***	0.473***	0.483***	0.455***	0.308***	0.504*
	(0.081)	(0.080)	(0.090)	(0.090)	(0.103)	(0.090)	(0.252)
N	3,543	3,543	3,543	3,543	3,403	3,447	2,063
R2	0.017	0.021	0.08	0.084	0.059	0.042	0.054
Sample	All	All	All	All	4--5 Star	3--4 Star	1--3
Country FE		X		X	X	X	X
Time FE			X	X	X	X	X
P-Value: b=1	0.00	0.00	0.00	0.00	0.00	0.00	0.06

Note: This table shows the results from a hotel price pass-through regression. The dependent variable is the change in the log average hotel price of a country *i* where the hotels are based between year *t* and *t-1*. The independent variable is the change between the log exchange rate of of country *i* relative to the U.S. dollar (USD). Column (1) does not include fixed effects. Column (2) includes country *i* fixed effects. Column (3) includes year *t* fixed effects. Column (4) includes country *i* and year *t* fixed effects. In column (5), the dependent variable is the change in the log hotel price for only 4–5 star hotels. In column (6), the dependent variable is the change in the log hotel price for only 3–4 star hotels. In column (7), the dependent variable is the change in the log hotel price for only 1–3 star hotels.

Table 2: Tourist Arrival Regressions

	ΔArrivals					
	(1)	(2)	(3)	(4)	(5)	(6)
ΔBilateral Exchange Rate	-0.109***			-0.073***	-0.018	-0.017
	(0.009)			(0.014)	(0.017)	(0.016)
ΔUSD vs. Origin Country		-0.187***		-0.109***	-0.147***	-0.157***
		(0.014)		(0.021)	(0.025)	(0.024)
ΔDominant Currency vs. Origin Country			-0.096***	-0.004	-0.022	-0.01
			(0.010)	(0.015)	(0.018)	(0.018)
N	225,086	233,108	240,705	220,888	154,659	154,659
R2	0.063	0.061	0.062	0.064	0.087	0.084
Time FE	X	X	X	X	X	X
Country Pair FE	X	X	X	X	X	X
Specification					With Controls	Control Sample

Note: This table shows the results from a tourist arrival regression. The dependent variable is the change in the log number of tourists arriving from country *j* to country *i* between year *t* and *t-1*. *ΔBilateral Exchange Rate* is the change in the log exchange rate between origin country j relative to destination country i, where a positive sign indicates a depreciation (appreciation) of the origin (destination) country. *ΔUSD vs. Origin Country* is the change in the log exchange rate between origin country j relative to the U.S. dollar (USD), where a positive sign indicates a depreciation of the origin country relative to the USD. *ΔDominant Currency vs. Origin Country* is the change in the log exchange rate between origin country j relative to (destination) country-specific dominant currency (CSDC), where a positive sign indicates a depreciation of the origin country relative to the (destination) CSDC. Time (year) and country-pair fixed effects are included in all columns. Column (5) estimates the regressions with controls, and column (6) estimates the regression without controls but with the sample of column (5).

Table 3: Tourist Arrival Regressions

	Δ Arrivals		
	1	2	3
Δ Bilateral Exchange Rate	-0.168***		
	(0.012)		
Δ USD vs. Origin Country		-0.191***	
		(0.013)	
Δ Dominant Currency vs. Origin Country			-0.170***
			(0.013)
N	225,069	233,092	240,672
R2	0.152	0.152	0.151
Country*Time FE	X	X	X
Country Pair FE	X	X	X

Note: This table shows the results from a tourist arrival regression. The dependent variable is the change in the log number of tourists arriving from country *j* to country *i* between year *t* and *t-1*. *ΔBilateral Exchange Rate* is the change in the log exchange rate between origin country j relative to destination country i, where a positive sign indicates a depreciation (appreciation) of the origin (destination) country. *ΔUSD vs. Origin Country* is the change in the log exchange rate between origin country j relative to the U.S. dollar (USD), where a positive sign indicates a depreciation of the origin country relative to the USD. *ΔDominant Currency vs. Origin Country* is the change in the log exchange rate between origin country j relative to (destination) country-specific dominant currency (CSDC), where a positive sign indicates a depreciation of the origin country relative to the (destination) CSDC. Destination-country*Time (year) and country-pair fixed effects are included in all columns.

Table 4: Hotel Price Pass-Through Regression and U.S. Dollar Borrowing

	Δ Hotel Price in Local Currency			
	(1)	(2)	(3)	(4)
% Depreciation against USD	-0.049***	-0.101***	-0.076**	0.094
	(0.184)	(0.147)	(0.207)	(0.819)
% Depreciation against USD × Share USD Borrowing	1.908	2.078	1.587	1.895
	(0.660)	(0.636)	(0.614)	(3.969)
N	1,499	1,456	1,499	1,251
R2	0.139	0.130	0.088	0.077
Sample	All	4-5 Star	3-4 Star	1--3
Country FE	X	X	X	X
Time FE	X	X	X	X

Note: This table shows the results from a hotel price pass-through regression. The dependent variable is the change in the log average hotel price of a country i where the hotels are based between year t and t-*1*. *percent Depreciation against USD* is the change between the log exchange rate of country i relative to the U.S. dollar (USD). *Share USD Borrowing* is the share of USD Borrowing of companies in country *i,* as described in Adler et al. (2020). Column (1) does not include fixed effects. Column (2) includes country i fixed effects. Column (3) includes year t fixed effects. Column (4) includes country i and year t fixed effects. In column (5), the dependent variable is the change in the log hotel price for only 4–5 star hotels. In column (6), the dependent variable is the change in the log hotel price for only 3–4 star hotels. In column (7), the dependent variable is the change in the log hotel price for only 1–3 star hotels.

Table 5: Tourist Arrival Regression: The Role of Dominant Currency Financing

	ΔArrivals								
	***	***		***		***		***	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
ΔBilateral Exchange Rate	-0.045	-0.160	-0.181	-0.270	-0.093	-0.062	0.004	-2.001	-35.57
	(0.017)	(0.042)	(0.148)	(0.051)	(0.138)	(0.022)	(0.139)	(0.402)	(34.885)
ΔUSD vs. Origin Country	-0.130	-0.050	0.131	0.096	0.075	-0.119	0.043	1.728	-12.813
	(0.026)***	(0.038)	(0.139)***	(0.042)**	(0.136)***	(0.029)*	(0.140)***	(0.445)	(28.080)**
ΔDominant Currency vs. Origin Country	-0.064	-0.043	-0.412	-0.118	-0.451	-0.042	-0.513	0.055	33.482
	(0.018)	(0.035)***	(0.117)***	(0.046)***	(0.115)***	(0.022)	(0.124)**	(0.213)***	(14.632)
ΔBilateral Exchange Rate×USD		0.447	0.679	0.489	0.377	0.001	0.003	18.602	408.483
		(0.133)***	(0.206)**	(0.097)***	(0.124)**	(0.000)	(0.001)**	(4.645)***	(436.140)
ΔUSD vs. Origin Country×USD		-0.350	-0.392	-0.530	-0.297	-0.000	-0.002	-15.491	-222.76
		(0.132)	(0.193)	(0.085)*	(0.117)	(0.000)**	(0.001)	(5.039)	(457.520)
ΔDominant Currency vs. Origin Country×USD		-0.029	-0.251	0.160	0.047	-0.001	-0.001		
		(0.112)	(0.165)	(0.084)	(0.126)	(0.000)	(0.001)		
N	94,286	94,286	71,239	94,286	71,239	94,286	71,239	4,657	3,678
R2	0.064	0.065	0.081	0.065	0.081	0.065	0.081	0.134	0.152
Time FE	X	X	X	X	X	X	X	X	X
Country Pair FE	X	X	X	X	X	X	X	X	X
Definition USD	-	Share Liab.	Share Liab.	Share Debt	Share Debt	Share Liab./GDP	Share Liab./GDP	Debt NFC	Debt NFC
Controls	-	-	X	-	X	-	X	-	X

Note: This table shows the results from a tourist arrival regression. The dependent variable is the change in the log number of tourists arriving from country *j* to country *i* between year *t* and *t-1*. *ΔBilateral Exchange Rate* is the change in the log exchange rate between origin country j relative to destination country i, where a positive sign indicates a depreciation (appreciation) of the origin (destination) country. *ΔUSD vs. Origin Country* is the change in the log exchange rate between origin country j relative to the U.S. dollar (USD), where a positive sign indicates a depreciation of the origin country relative to the USD. *ΔDominant Currency vs. Origin Country* is the change in the log exchange rate between origin country j relative to (destination) country-specific dominant currency (CSDC), where a positive sign indicates a depreciation of the origin country relative to the (destination) CSDC. USD indicates various measure of U.S. dollar borrowing. In column (1), the baseline is estimated without interaction but with the sample that has USD borrowing. Columns (2) and (3) define USD as the share of external liabilities in U.S. dollars. Columns (4) and (5) define USD as the share of external debt liabilities in U.S. dollars. Columns (6) and (7) define USD as the external liabilities in U.S. dollars, percent gross domestic product (GDP). Columns (8) and (9) define USD as the FX Debt of Firms / GDP. Time (year) and country-pair fixed effects are included in all columns.

Table 6: Tourist Arrival Regression: The Role of Concentration

	ΔArrivals					
	(1)	(2)	(3)	(4)	(5)	(6)
Concentration	-0.087***	-0.037***	-0.038***	-0.038***	-0.037***	0.008***
	(0.014)	(0.006)	(0.006)	(0.006)	(0.008)	(0.001)
ΔBilateral Exchange Rate	-0.171***	-0.084***	-0.082**	-0.082**	-0.353***	-0.059
	(0.026)	(0.015)	(0.015)	(0.015)	(0.067)	(0.016)
ΔBilateral Exchange Rate×Concentration	0.322	0.106***	0.106***	0.106***	0.275**	0.013***
	(0.078)	(0.041)	(0.042)	(0.042)	(0.052)	(0.014)
ΔUSD vs. Origin Country	-0.048**	-0.115	-0.117	-0.117	0.176	-0.140
	(0.034)	(0.021)	(0.021)	(0.021)	(0.076)	(0.023)
ΔUSD vs. Origin Country×Concentration	-0.194***	0.022**	0.028**	0.028**	0.024	0.009
	(0.094)	(0.049)	(0.050)	(0.050)	(0.066)	(0.015)
ΔDominant Currency vs. Origin Country	0.080***	0.032***	0.032***	0.032***	0.018***	0.024***
	(0.030)	(0.015)	(0.016)	(0.016)	(0.063)	(0.016)
ΔDominant Currency vs. Origin Country×Concentration	-0.269	-0.244	-0.251	-0.251	-0.428	-0.037
	(0.091)	(0.045)	(0.046)	(0.046)	(0.070)	(0.009)
N	220,639	220,639	217,489	217,489	154,471	209,017
R2	0.065	0.065	0.065	0.065	0.089	0.065
Time FE	X	X	X	X	X	X
Country Pair FE	X	X	X	X	X	X
Speci cation	Share Top	High Share (1)	Share Top	High Share (1)	High Share (1)	Tourist Reliance
Origin Sample	All	All	Excl. US	Excl. US	All:Controls	All

Note: This table shows the results from a tourist arrival regression. The dependent variable is the change in the log number of tourists arriving from country *j* to country *i* between year *t* and *t-1*. *ΔBilateral Exchange Rate* is the change in the log exchange rate between origin country j relative to destination country i, where a positive sign indicates a depreciation (appreciation) of the origin (destination) country. *ΔUSD vs. Origin Country* is the change in the log exchange rate between origin country j relative to the U.S. dollar (USD), where a positive sign indicates a depreciation of the origin country relative to the USD. *ΔDominant Currency vs. Origin Country* is the change in the log exchange rate between origin country j relative to (destination) country-specific dominant currency (CSDC), where a positive sign indicates a depreciation of the origin country relative to the (destination) CSDC. Concentration indicates various measure of concentration. In columns (1) and (3), it is defined as the share of tourists arriving from the top origin country. In columns (2), (4), and (5), it is defined as a dummy that is one if the share of tourists arriving from the top origin country is above the median. In column (6), it is defined as the share of tourist arrivals per year over total population. Columns (3) and (4) exclude the United States as a origin country. Column (5) includes controls. Time (year) and country-pair fixed effects are included in all columns.

Table 7: Tourist Arrival Regression, by Dominant Origin Country

	ΔArrivals						
	1	2	3	4	5	6	7
ΔBilateral Exchange Rate	-0.022	-0.247**	-0.303***	0.033	-0.01	-0.012	0.269***
	(0.154)	(0.116)	(0.025)	(0.02)	(0.063)	(0.074)	(0.043)
ΔUSD vs. Origin Country	0.692	-0.014	0.124**	-0.195***	0.313**	0.001	-0.502***
	(0.683)	(0.172)	(0.057)	(0.029)	(0.127)	(0.131)	(0.055)
ΔDominant Currency vs. Origin Country	-0.694	-0.025	-0.048	0.007	-0.397***	-0.265**	
	(0.638)	(0.115)	(0.047)	(0.019)	(0.082)	(0.117)	
N	4,513	14,063	48,559	95,581	12,031	7,123	39,018
R2	0.062	0.08	0.075	0.064	0.07	0.078	0.075
Time FE	X	X	X	X	X	X	X
Country Pair FE	X	X	X	X	X	X	X
Dominant Country	Australia	China	Euro Area	Other	Russia	United Kingdom	United States

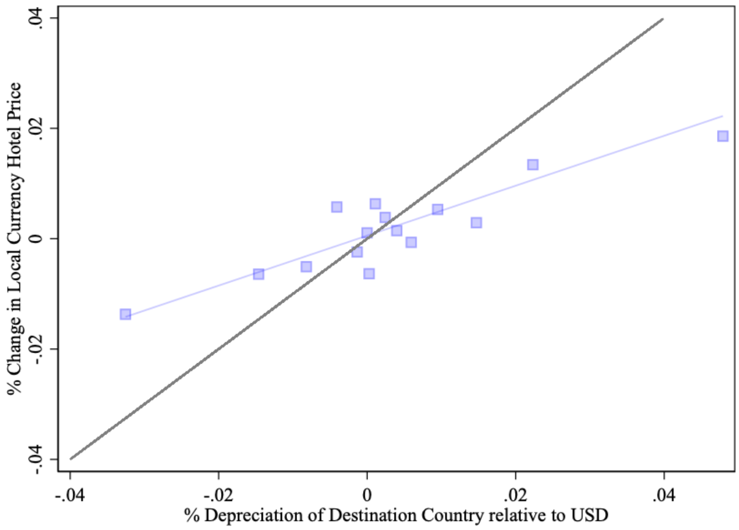
Note: This table shows the results from a tourist arrival regression. The dependent variable is the change in the log number of tourists arriving from country *j* to country *i* between year *t* and *t-1*. *ΔBilateral Exchange Rate* is the change in the log exchange rate between origin country j relative to destination country i, where a positive sign indicates a depreciation (appreciation) of the origin (destination) country. *ΔUSD vs. Origin Country* is the change in the log exchange rate between origin country j relative to the U.S. dollar (USD), where a positive sign indicates a depreciation of the origin country relative to the USD. *ΔDominant Currency vs. Origin Country* is the change in the log exchange rate between origin country j relative to (destination) country-specific dominant currency (CSDC), where a positive sign indicates a depreciation of the origin country relative to the (destination) CSDC. The columns restrict the sample to various (destination) country groups. Column (1) includes countries where the dominant country is Australia. Column (2) includes countries where the dominant country is China. Column (3) includes countries where the dominant country is the euro area. Column (4) includes countries where the dominant country are all others. Column (5) includes countries where the dominant country is Russia. Column (6) includes countries where the dominant country is the United Kingdom. Column (7) includes countries where the dominant country is the United States.

Table 8: Tourist Arrival Regression, by Peg

	Δ Arrivals		
	(1)	(2)	(3)
Δ USD vs. Origin Country	-0.110***	-0.116***	-0.106***
	(0.021)	(0.021)	(0.021)
Δ USD vs. Origin Country ×Peg	0.026	0.071	
	(0.053)	(0.050)	
Δ Bilateral Exchange Rate	-0.073***	-0.074***	-0.075***
	(0.014)	(0.014)	(0.015)
Δ Dominant Currency vs. Origin Country	-0.002	-0.008	-0.008
	(0.015)	(0.016)	(0.015)
Δ Dominant Currency vs. Origin Country ×Peg	-0.099	0.018	0.041
	(0.075)	(0.046)	(0.049)
Δ Bilateral Exchange Rate ×Peg			0.027
			(0.048)
N	220,888	220,888	220,888
R2	0.064	0.064	0.064
Time FE	X	X	X
Country Pair FE	X	X	X
Peg	Bilateral	Dest. USD	Origin USD

Note: This table shows the results from a tourist arrival regression. The dependent variable is the change in the log number of tourists arriving from country *j* to country *i* between year *t* and *t-1*. *ΔBilateral Exchange Rate* is the change in the log exchange rate between origin country j relative to destination country i, where a positive sign indicates a depreciation (appreciation) of the origin (destination) country. *ΔUSD vs. Origin Country* is the change in the log exchange rate between origin country j relative to the U.S. dollar (USD), where a positive sign indicates a depreciation of the origin country relative to the USD. *ΔDominant Currency vs. Origin Country* is the change in the log exchange rate between origin country j relative to (destination) country-specific dominant currency (CSDC), where a positive sign indicates a depreciation of the origin country relative to the (destination) CSDC. Peg is dummy that is one if there is a peg between country I and country j in column (1), there is a peg between the destination country j and the USD in column (2), and whether there is peg between the origin country i and the USD in column (3).

Figure 1: Hotel Price Sensitivity

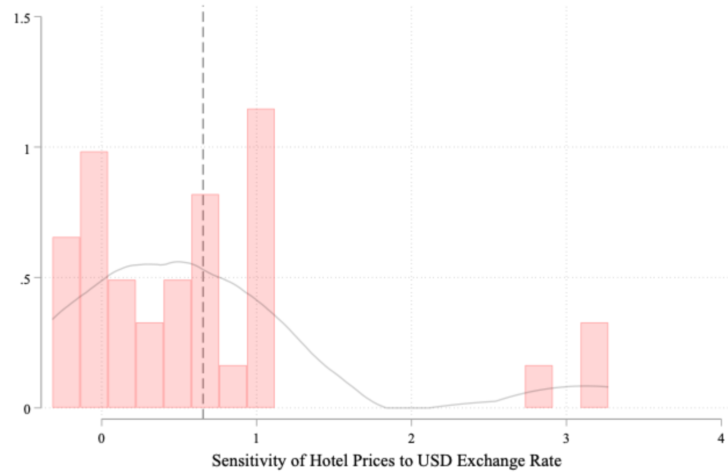


Note: This graph shows a binscatter plot between the percent depreciation of the destination country relative to the U.S. dollar (on the horizontal axis) and the percent change in local currency hotel prices (on the vertical axis).

Figure 2: Country-Specific Elasticity of Hotel Prices (in Local Currency) to Exchange Rate

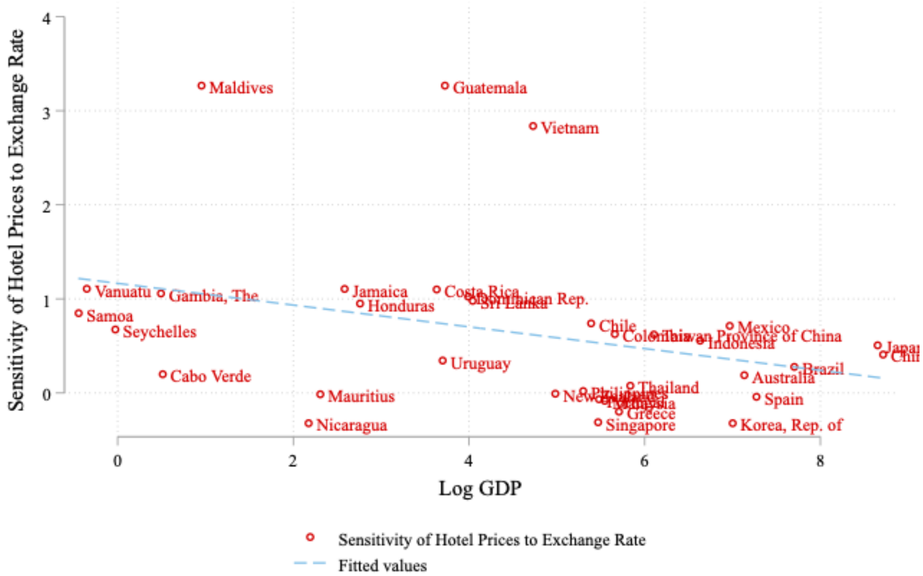
Note: This graph shows the estimated coefficient of a time-series regression for each country of percent change in local currency hotel prices on the percent depreciation of the destination country relative to the U.S. dollar.

Figure 3: Country-Specific Elasticity of Hotel Prices (in Local Currency) to Exchange Rate



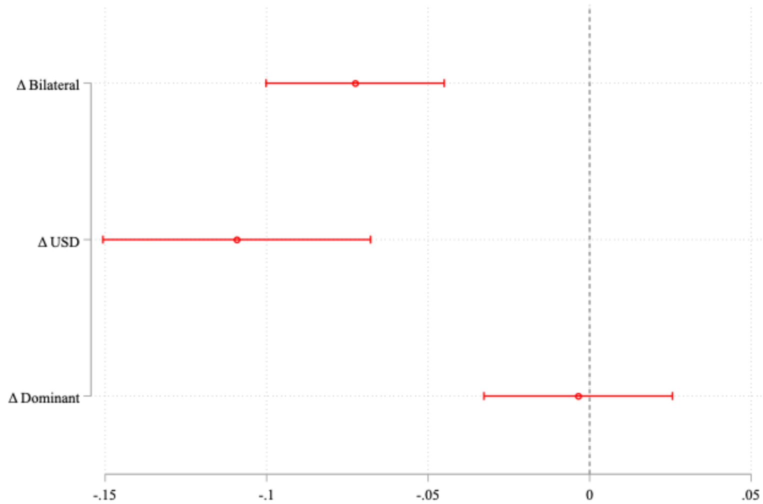
Note: This graph shows a histogram of the coefficient of a time-series regression for each country of percent change in local currency hotel prices on the percent depreciation of the destination country relative to the U.S. dollar.

Figure 4: Sensitivity of Hotel Prices and Country Size



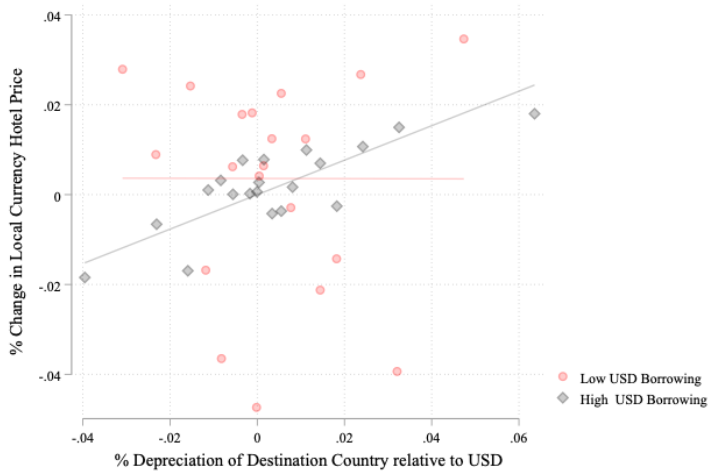
Note: This graph shows a scatterplot between the the coefficient of a time-series regression for each country of percent change in local currency hotel prices on the percent depreciation of the destination country relative to the U.S. dollar (on the vertical axis) and log gross domestic product (GDP) of the country (on the horizontal axis).

Figure 5: Exchange Rate Elasticity of Tourism Arrivals



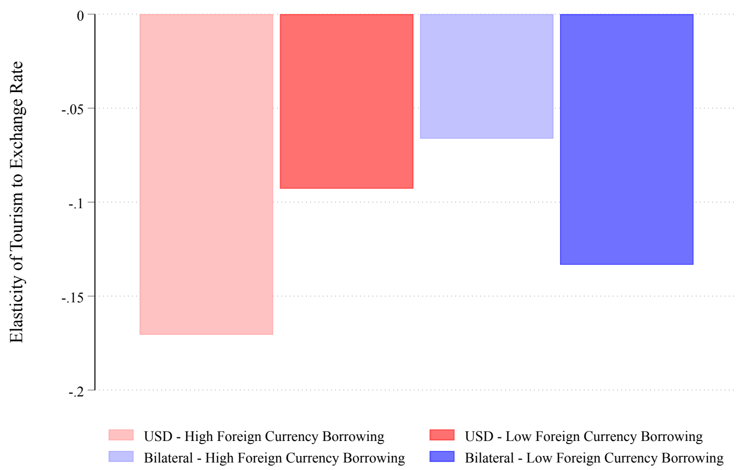
Note: This graph shows the the estimated effects of the percent bilateral depreciation of the origin country relative to the destination country, the percent depreciation of the origin country relative to the U.S. dollar, and the percent depreciation of the origin country relative to the (destination) country-specific dominant currency on tourist arrivals from origin country to destination country.

Figure 6: Sensitivity of Hotel Prices and U.S. Dollar Borrowing



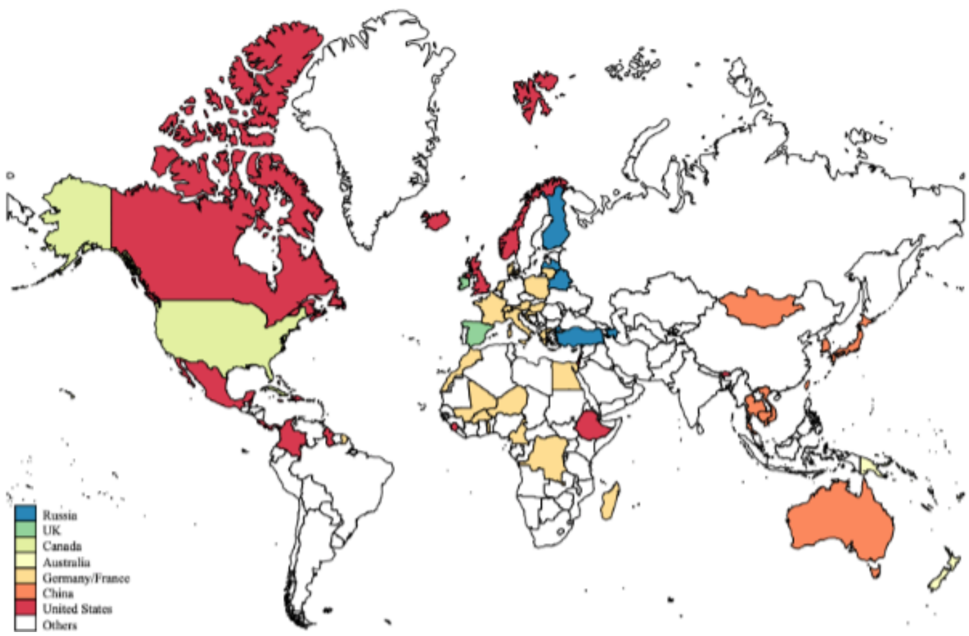
Note: This graph shows a binscatter plot between the percent depreciation of the destination country relative to the U.S. dollar (USD) (on the horizontal axis) and the percent change in local currency hotel prices (on the vertical axis) split by countries with a high (black diamonds) and low (red dots) USD borrowing.

Figure 7: The Exchange Rate Elasticity of Tourist Arrivals and U.S. Dollar Borrowing



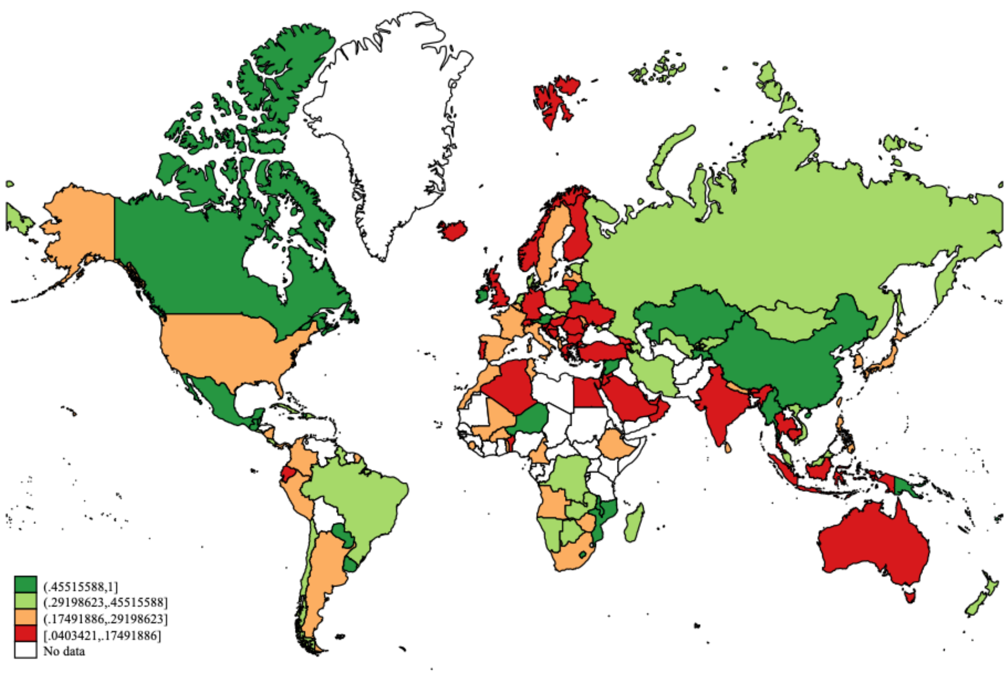
Note: This graph shows the estimated effects of the percent bilateral depreciation of the origin country relative to the destination country (blue) and percent depreciation of the origin country relative to the U.S. dollar (USD) (red) for the destination country with high (above median) in shaded colors and low (below median) U.S. dollar borrowing in solid colors on tourist arrivals from origin country to destination country.

Figure 8: Dominant Currency Country



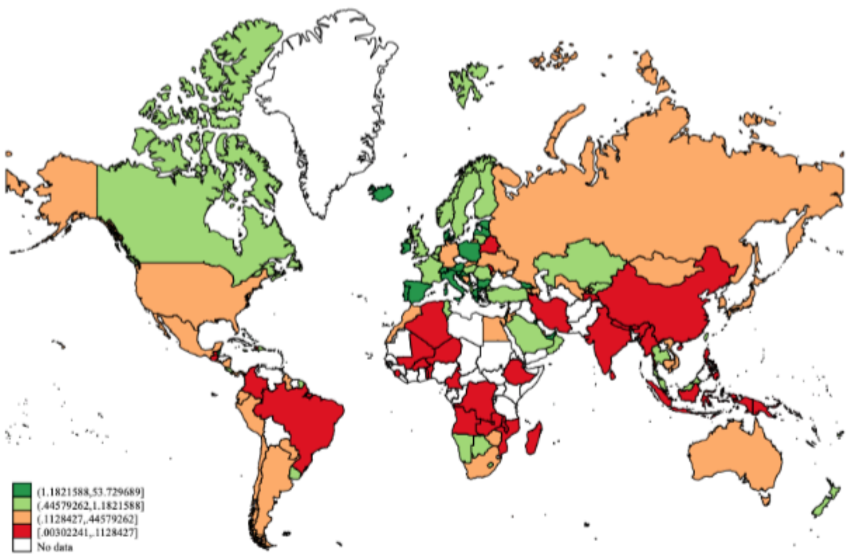
Note: This map indicates the country where the largest share of tourists are originating from.

Figure 9: Concentration of Tourist Arrivals



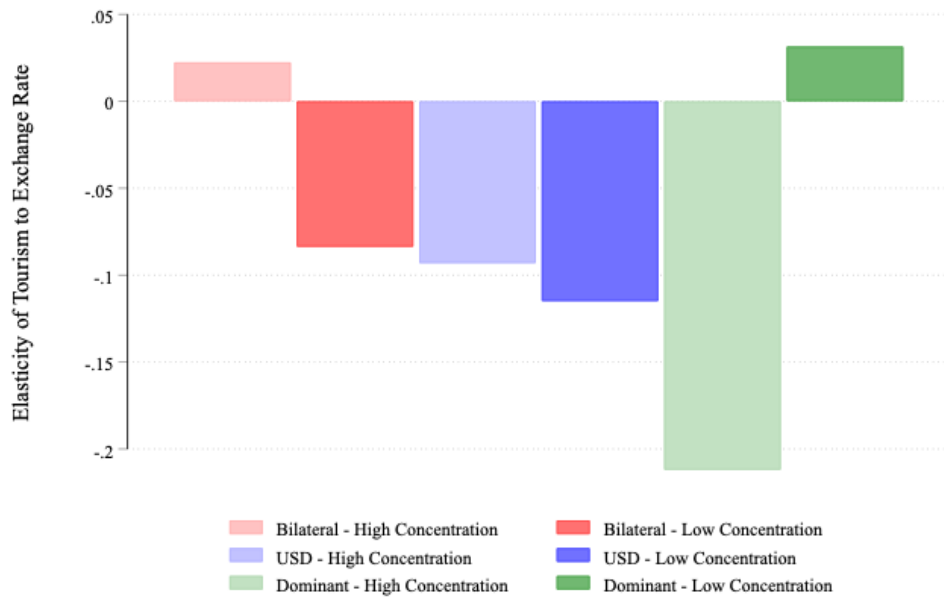
Note: This map indicates the share of tourists arriving from the country where the largest number of tourists are arriving from.

Figure 10: Tourism Dependence



Note: This map indicates the share of annual tourist arrivals as a share of the local population.

Figure 11: The Exchange Rate Elasticity of Tourist Arrivals and Concentration



Note: This graph shows the estimated effects of the percent bilateral depreciation of the origin country relative to the destination country (red), percent depreciation of the origin country relative to the U.S. dollar (blue) for destination country and the percent depreciation of the origin country relative to the (destination) country dominant currency (green), with high (above median) in shaded colors and low (below median) concentration (share of tourists coming from the top country) in solid colors on tourist arrivals from origin country to destination country.