



Forecasting Short Run Tourism Demand and GDP in the Face of Large Exogenous Shocks: The Case of Mexico and the COVID-19 Pandemic

José I. Casar*, Francisco Madrid**

Abstract Mexico is a relevant player in international tourism ranking seventh in tourist arrivals (2019). Mexico's domestic market, however, accounts for 76.3% of total tourism consumption. Tourism contributes 8.7% of GDP and employs 4.1 million people. The COVID-19 pandemic is having a profound impact on the Mexican tourism industry.

The industry must capture the interest of decision-makers in the public sphere to influence policy and attract resources to minimize the pandemic's effects. To this end, it is imperative to have well-founded estimates of the severe impacts that the sector will suffer in the short run.

Given the nature of the present crisis, which has locked down supply and imposed severe mobility restrictions, econometric relationships are of little use in forecasting demand. The approach followed here is based on tapping industry knowledge to estimate total tourism consumption (in a Tourism Satellite Account framework) and complement it with econometric estimates for other variables. Drawing on other sources for the first months of 2020 and on a survey of business executives explicitly designed for this work for June-December, an estimate of tourism consumption, GDP, and employment for Mexico in 2020 is provided. Preliminary figures for June and July suggest the method may prove fruitful, yet further work remains to be done, in particular in the area of non-market related travel.

Keywords: Tourism policy, Mexico's tourism, COVID-19 assessment, Sustainable Tourism, Forecasting tourism demand.

INTRODUCTION

The economic impact of the COVID-19 pandemic on tourism has been enormous and will be felt for a long time. Its formidable propagation capacity and its lethality will most likely bring about essential changes in how people will travel in the years to come so that estimating its long run effects on tourism is fraught with uncertainty. Even short run forecasting of the impact of the pandemic on tourism activity, however, is proving to be a challenging and uncertain endeavor. The United Nations World Tourism Organization (UNWTO), for example, has modified its original forecast, published in late April, in which it estimated that the reduction in international tourist flows -measured in international tourist arrivals-would be between 1 and 3% (UNWTOa, 2020), and was,

by May, providing three scenarios with demand falling by 58, 70 and 78%, depending on whether travel dynamics are restored in July, September or December (UNWTOb, 2020).

Among the reasons that explain the overwhelming impact of this health contingency on tourism, at least three deserve to be highlighted:

- First and foremost is the obvious fact that efforts to stop the spread of the virus that causes the disease (SARS-CoV-2) led governments worldwide to limit or ban human mobility so that inevitably the fall in tourism GDP will be proportionately larger than in the rest of the economy. In this regard, the UNWTO (2020c) has indicated that 100% of countries surveyed established some type of travel restriction. The eventual lifting of

* University Program for Development Studies (PUED), National Autonomous University of Mexico (UNAM).
Email: jcasar@gmail.com

** Anahuac University. Email: francisco.madrid@anahuac.mx

these mechanisms will occur in a piecemeal manner that will discourage important segments of the market. An interdisciplinary study (Chinazzi et al. (2020)) concludes that although the quarantine imposed on trips from Wuhan had a delay effect on the spread of the virus to the rest of the country of between 3 and 5 days, isolation measures were much more effective on an international scale: virus exports were reduced by around 80% until mid-February 2020. Gössling et al. (2020) indicate that the ban on displacement affected 90% of the world population.

- The limits imposed on mobility, within and among countries, on an unprecedented global scale, is giving rise to a world economic recession of significant proportions: the IMF expected, in April, a 3.0% reduction of world GDP in 2020¹ (IMF, 2020). The corresponding fall in people's disposable income will further limit the demand for holiday travel and firms will have to cut back on their travel expenses due to pressures derived from the economic difficulties they face.
- Finally, it seems reasonable to anticipate that in addition to the structural reasons already mentioned, the mobility of people, especially concerning leisure trips, could be affected by increased risk aversion regarding the possibility of contagion. This could last for a long period, at the very least until there are medical guarantees that minimize the feeling of risk - either through the existence of a vaccine or through effective therapeutical treatment.

One of the items that cause the most significant concern about the dimension of the impending damage is the loss of employment that will derive from the contraction of tourism flows in the world. The World Travel and Tourism Council (2020) has estimated the fall in employment at more than 100 million jobs in the travel and tourism industry².

The COVID-19 pandemic is having a profound impact on the Mexican tourism industry due to its dependence on the US market (80% of arrivals) and the weight of the domestic market (76.3% of tourism consumption), both of which have been hit particularly hard by the pandemic. Mexico is a relevant player on the international tourism scene -7th place in the international ranking in terms of tourist arrivals and 16th in terms of income from international visitors- (UNWTO, 2020d). Although tourism policy in the final part of the last century was centered on capturing foreign exchange, the largest part of the tourism market is

provided by residents travelling within Mexico. 76.3% of tourist consumption is accounted for by the domestic market (NISG, 2019).

The economic benefits derived from tourism in the country are remarkable. According to the National Institute of Statistics and Geography (NISG) tourism accounts for 8.7% of GDP as measured by the Tourism Satellite Account (NISG, 2019), the surplus in the Tourism Balance of the balance of payments was 14.7 billion dollars in 2019, 1.2% of GDP (Mexico's Central Bank, 2020) and the industry employed 4.1 million people, 7.4% of the employed workforce in 2019 (Ministry of Labor and Social Security, 2020).

Besides the macroeconomic relevance of the travel and tourism industry, its contribution to social welfare is also relevant. Among them, its central role in combating poverty stands out, an example of this is that while the national average of people living in poverty is 41.9%, States where tourism is the leading economic activity such as Quintana Roo (where Cancún is located) and Baja California Sur (where Los Cabos is located) have much lower poverty rates -27.6 and 18.1%, respectively- (National Council for the Evaluation of Social Policy, 2019).

Despite the strategic role tourism plays in Mexico, and the fact that it has been severely hit by the crisis, the industry has not been able to escape the fate of the rest of the economy: the current national government (2018-2024) has provided little if any, support to economic activity as a response to the pandemic³. Furthermore, it has not only disregarded the importance of the travel and tourism industry and has consequently failed to grant it the priority which the General Tourism Law nominally accords it, but has limited the scope and reduced the number of instruments of tourism policy. Examples in this respect include the dismantling of Mexico's Tourism Board, the cancellation of the national budget for tourism promotion, and the elimination of funding for state governments to support the development of infrastructure and urban equipment in tourism destinations.

The combination of a government with no apparent interest in tourism, despite its contributions to development, with the damage the pandemic is already wreaking throughout the industry represents a challenge of enormous proportions. It should be expected that the actors directly interested in the sector will redouble their efforts to capture the interest of decision-makers in the public sphere, to mobilize the resources and support required to ameliorate their economic plight and its social consequences.

¹ In June IMF modified this forecast to a global growth of -4.9%.

² In a recent tweet (September the 22th of 2020) the President and CEO of WTTC mentioned that 197 million of jobs in tourism are in risk

³ At around 1.4% of GDP, fiscal stimulus in Mexico in the wake of the pandemic-induced recession is the lowest among the G20 countries according to the IMF (2020).

For this purpose, it is necessary to have well-founded estimates of the magnitude of the effects of the pandemic on the travel and tourism industry. Mexico has a fairly ample and reliable statistical framework on tourism on which to ground this effort. Among these the Tourism Satellite Account (TSA) stands out, but available information includes also the Survey of International Travelers (SIT); the Border Travelers Survey (BTS) both published monthly by the NISG; and the Quarterly Indicator of Tourist Activity (QITA). Likewise, there is a monitoring system for hotel activity indicators in charge of the Ministry of Tourism, as well as information on relevant tourism variables in the Ministry of Communications and Transport, the Migration Policy Unit of the Ministry of the Interior, and the Labor Observatory of the Ministry of Labor and Social Security.

The prospects for Mexican tourism are daunting. According to information compiled by Hall et al. (2020) the *A-H1N1* pandemic in 2009, the extent of which was much less severe and transitory than the present pandemic, produced a loss for Mexican tourism of 2.8 billion dollars, although other sources (WTTC, 2020) value the shortfall at 5.0 billion dollars. Using the Matrix of potential evolutionary paths towards the transformation of tourism, Brouder (2020) outlines the possibility of the advent of a new disruptive scenario after COVID-19, in which, without a doubt, new public policies would be required to be able to launch the innovations necessary to adapt to the changes that a new tourism would demand. In the same way, Cooper and Alderman (2020) are correct in indicating that of the myriad impacts to tourism as a consequence of the pandemic, many of them remain –and will remain, in our opinion– without full understanding for a long time period.

Nevertheless, even if the uncertainty surrounding future trends in tourism renders any attempt at long term forecasting highly speculative, it is our opinion that producing short run estimates of the main aggregates for the industry –tourism consumption demand, tourism GDP, and tourism employment– is both feasible and useful as a tool to inform public policy.

LITERATURE BACKGROUND

This work was supported by a review of the literature in which the following databases were used: *EBSCOhost*, *Google Scholar*, *Scopus*, and *Web of Science*, to identify the relevant academic production, following up in many cases the sources cited by the documents selected in the review. Despite the short time elapsed since the beginning of the pandemic and the time of writing, there is a large academic production that seeks to assess the effects of the global spread of COVID-19 and the policy responses to deal with it. It must be noted from the start that an important part of this effort corresponds to what is often referred to as gray literature.

In addition to the sources mentioned above –Chinazi et al. (2020), Hall et al. (2020), Brouder (2020), and Cooper & Alderman (2020)– a brief review of texts is presented below of some of the works that have built relevant approaches to the theoretical elaboration on the economic effects of the pandemic on tourism.

Jiao and Chen (2018), after reviewing 72 demand forecasting studies carried out between 2008 and 2017, indicate that the models surveyed fall into 3 categories: econometric studies, time series analysis, and “artificial intelligence”, a term used to include recent efforts at harnessing new sources of information such as the analysis of traffic in the internet and techniques such as big data processing to detect market trends in tourism. In more recent work, Li and Jiao (2020) reach similar conclusions. It is worth noting, however, that neither survey identifies the forecasting of the economic impact on tourism of large exogenous shocks, such as the on-going pandemic, as an issue of particular interest.

Nicola et al. (2020) provide evidence of the profound socio-economic effects stemming from this public health phenomenon; they list the impacts on the agricultural, oil and manufacturing sectors, on education, financial services, health care, real estate, the sports industry, technology and the media, food, family dynamics and, of course, on the tourism industry and its sub-sectors from the hospitality industry to aviation. No attempt, however, is made to quantify the overall impact on these industries apart from a compilation of the damage reports consigned in news sources. Cooper and Alderman (2020), identify and reproduce reports on the economic impacts resulting from the cancellation of important sporting events in the current global context. While not engaging in a discussion of the accuracy of the estimates, they coincide in anticipating further relevant effects of the crisis in the sociocultural and environmental spheres. Pulido et al. (2019) find that environmental sustainability concerns have a positive and significant influence on the growth perspectives of the travel and tourism industry.

Fernandes (2020) reviews the different economic channels through which the crisis affects tourism. They point out that there are asymmetries in the effects, both by country and by type of industry; likewise, he emphasizes the multiplying effects of a connected and integrated world on the damage inflicted by the crisis. The author finds that the characteristics of the current pandemic are unique and therefore cannot be compared with previous crises since it involves a simultaneous collapse of demand and supply; finally, after evaluating different scenarios, the study finds that the contraction in GDP could, in some countries, exceed 15%. In an approach to the subject from the perspective of health professionals, Ahmed et al. (2020) find that beyond the challenges in terms of human health, the pandemic brings challenges in ten areas: international trade, the supply of medical supplies, food, transportation, trade, tourism,

global value chains, financial markets for energy and social activities. Lu et al. (2020), specifically analyzing the case of small and medium-sized companies in Wuhan, the point of origin of the pandemic, document that more than 80% of them require government aid and identify four areas that should be addressed by public policy: reductions in the tax burden, employment subsidies, operation expenditure subsidies and financial support.

Chang et al. (2020), in line with previous evaluations regarding the enormous magnitude of the effects of the crisis, outline what could constitute a chart for the sustainability of tourism after the pandemic and suggest the convenience of conducting research on how the industry will recover and how it will be sustainable in a new environment. Gössling et al (2020: 13) argue that «The COVID-19 pandemic should lead to a critical reconsideration of the global volume growth model for tourism, for interrelated reasons of risks incurred in global travel as well as the sector's contribution to climate change».

FORECASTING SHORT RUN ECONOMIC TRENDS IN TOURISM. THE CASE OF MEXICO.

Using traditional methods to forecast tourism economic activity does not seem promising in the face of the disruption caused by COVID-19 and the policy measures designed to contain it. Following Jiao and Chen's typology it must be noted, firstly, that econometric studies that model and forecast tourism demand based on behavioral equations that usually include personal disposable income and relative prices as explanatory variables are, by definition, irrelevant in a context of supply lockdown (air travel and the hotel industry, for instance, have been deemed non-essential in many countries and hence directed to suspend operations) and mobility restrictions on would-be travelers. Having said this, it is the case, nevertheless, that other econometric relationships of a more technical character are still useful to produce forecasts of activity, as it will be noted later.

Secondly, time series analysis, does not seem adequate either in the present context, if only because the magnitude of the present shock falls outside the range of any changes in demand experienced over previous estimation periods by an extremely wide margin.

Finally, the recourse to new methods and sources discussed by Jiao and Chen (2018) seems promising as a way of discerning future trends in consumer preferences and travel patterns, and might even serve as a guide to quantifying expenditure volumes, but has not so far been developed -to our knowledge- into a consistent forecasting tool for economic aggregates in a manner consistent with the usual national account framework which would enable

analysts and policy-makers to make useful comparisons with previous knowledge of the economic dynamics of the tourism industry.

In order to estimate the short run impact of the pandemic in Mexico's tourism, in the absence of a clear methodological path in the literature, a twofold approach is followed: a forecast of tourism demand based on a survey of key actors in the industry is made, and then these estimates are used to forecast GDP and employment using econometric (reduced form) equations.

The survey collected a total of 30 questionnaires from key business executives of companies representing different market segments in the sector. The determination of the sample for the survey was made through a selection based on the relevance of the actors and included representatives of the most important hotel chains in the country, national and international airlines, holiday exchange companies, destinations' visitor offices, and airports, among other audiences. This information was obtained in May. The focus of the survey was on the expected pace of recovery of different sectors of tourism demand (inbound, domestic, leisure and business travel); in particular it inquired about the percentage of "normal" business (ie, the level of sales in each segment on the same month of 2019) they expected for June through December 2020.

It must be noted that in the case of the travel and tourism industry this procedure goes beyond the usual surveys of business expectations. Because of the nature of business in the industry, market knowledge of key players involves variables which are good *proxys* for the short run evolution of market demand. That is the case with airline and airport executives who have advance notice of the number of seats available at each destination, holiday exchange companies and hotel chains who are aware of the seasonal pace of reservations and the sale of rooms often months in advance, as well as the visitor offices who keep track of future demand from meetings and congress travel.

Survey results for each segment were used to simulate the trajectory of tourism consumption (domestic and inbound). These values were, in turn, used to project tourism GDP (in the National Accounts TSA definition) and then tourism employment using simple regression equations linking tourism consumption to GDP and GDP to employment. These econometric relationships need not be seriously affected by lockdown policies since they are more akin to technical coefficients -which are more or less fixed in the short run- than to behavioral relationships. In other words, it is reasonable to assume that each dollar's worth of demand will translate into the same amount of value-added as in the past. The same applies to the relationship between tourism GDP and employment, where the possible presence of "labor hoarding" or a procyclical behavior of labor productivity

was captured by including a trend and a cyclical component in the equation for the demand for labor. Nevertheless, it must be said that this procedure fails to deal with the effect of widespread bankruptcy which may accompany the extraordinary downturn in activity. This may imply that the impact on employment will be larger than what would be observed if all firms saw their level of sales reduced in the same proportion.

Part of tourism flows remain active despite the lockdown and are not captured in the survey because they are not market related and are not affected by the partial (voluntary) lockdown imposed to deal with the pandemic. This is the case of a fraction of border tourism and travel related to visiting families and friends or trips to secondary homes. To compensate for this fact, the mean values obtained in the survey were expanded by a factor equivalent to one standard deviation. While this assumption is arbitrary to a certain extent, it must be noted that these concepts account for around 20% of tourism consumption expenditure in the TSA and that the standard deviation in the survey means is also in the order of 13 to 20%.

An additional problem faced in trying to produce an estimate for 2020 as a whole was to include an estimate for the months prior to the application of the survey in May. The figures from the Survey of International Travelers published by the NSIG were used to approximate international tourism expenditure for January, February and March, and assumed a reduction of 92.5% in April and May given the observed 98.3% reduction in international passengers in Mexico's main 4 airports (which account for 67% of international travelers) and the fact that travel restrictions introduced in April were kept in place throughout May. The somewhat lower figure assumed in our study tries to account for the residual trips of border tourists.

In the case of domestic tourism consumption, the figure for 2018 in the TSA was updated to 2019 using the quarterly figures available in the QITA publication of the NISG. For January and February, we extrapolated the stagnating trend observed in domestic tourist consumption in 2019, and for the months from March to May we used the figures for hotel occupancy by residents, published by the Tourism Ministry for 70 destinations, as a proxy to estimate the monthly variation in consumption taking into consideration seasonal variations in domestic travel. This yielded the following values: March -25% (the reduction in the number of resident tourists arriving at hotel rooms was 34.4%); April -82.5% and May -85%, after the government directive to stay at home and the massive closure of hotel rooms. Again, it is worth mentioning that part of the market remains active because it is explained by non-market reasons and does not necessarily involve staying in collective accommodation establishments, but rather in second homes or at the home of family or friends.

The monthly figures for 2020 correspond to turnover -market size- at current prices both in the case of the estimates (January-May) and the business forecasts (June-December) described above. In the case of inbound tourism, values in dollars were converted at the market exchange rate for January and February. When values at constant prices were required (variation in tourism GDP, calculation of the impact on employment), the inflation rate observed in 2019 and that expected for 2020 as reported by the Survey of Economic Expectations of Private Sector Specialists of April 2020, published by the Central Bank on May 4, were used as deflators.

Finally, it should be noted that a fall in national GDP, at constant prices, of 7% for 2020 was assumed. Although this assumption does not intervene in the calculation of the fall in tourism consumption or tourism GDP, it is necessary when making comparisons with the evolution of the latter. The assumed value is in the middle range of the projections published in April and May by various multilateral institutions, academic institutions and economic research departments of the private sector, including those included in the Central Bank Survey cited, although it has been revised downwards to around -10% in recent months. The 7% contraction, in turn, translates into a 4.3% drop in the value of GDP at current prices when considering a price increase of the order of 2.9%.

The estimate of the variation in employment is based on an equation that links tourism GDP with the number of paid jobs that NSIG reports in the TSA. With the parameters of this equation and the estimates of tourism GDP described above, the tourism employment series of the Labor Observatory of the Ministry of Labor is projected to obtain the figure reported. This source was selected since it offers the most complete approximation to the number of people who work in tourism, including those engaged in informal activities.

RESULTS

In this section, the main results obtained using the methodology described are presented. They start with a report of the main results of the survey of key players in the travel and tourism industry, then a forecast of the main macroeconomic variables for the full year 2020 is presented and finally, a note comparing the forecast levels of demand with the available information on international inbound tourism and domestic travel is shown.

Findings in the Private Sector Survey

The questionnaire applied aimed to identify the business perception of the pace of recovery in the near future, for the domestic and international markets, both concerning

the leisure and business segments. Table 1 shows the mean values for the domestic market and the corresponding standard deviations for the months of June through December. The figures represent the value of the market by comparison to the value observed the previous year on the same month, so that the actual fall in activity is given by subtracting the values in the table from 100. We also show

the forecast for each month incorporating the assumption that the actual level of recovery would be larger than the survey expectations for the reasons discussed above. As one would expect, deviations from the mean increase as we look further towards the end of the year. We expect the collapse in the market to bottom out in June with a fall of more than 80% and a slow recovery in the rest of the year, leaving the shortfall still at roughly 25%.

Table 1: Estimation of the Domestic Market Recovery Rate, Leisure and Business Segments. Monthly market Size Expected in 2020 as a Percentage of 2019 Market Size in the Same Month

	Pleasure			Business			Weighting by segment. Pleasure: 87.7% Business: 12.3%
	Mean	Standard deviation	Mean + Standard deviation	Mean	Standard deviation	Mean + Standard deviation	
June	12.7%	4.7%	17.4%	15.5%	6.9%	22.3%	18.0%
July	29.4%	13.6%	43.0%	22.6%	8.3%	30.9%	41.5%
August	35.0%	13.8%	48.8%	29.7%	14.2%	43.9%	48.2%
September	31.9%	13.5%	45.4%	36.2%	16.6%	52.8%	46.3%
October	35.9%	13.0%	48.9%	46.6%	16.7%	63.3%	50.7%
November	42.8%	16.5%	59.3%	54.8%	16.4%	71.3%	60.7%
December	55.4%	19.0%	74.4%	55.9%	20.7%	76.6%	74.6%

Source: Private sector survey.

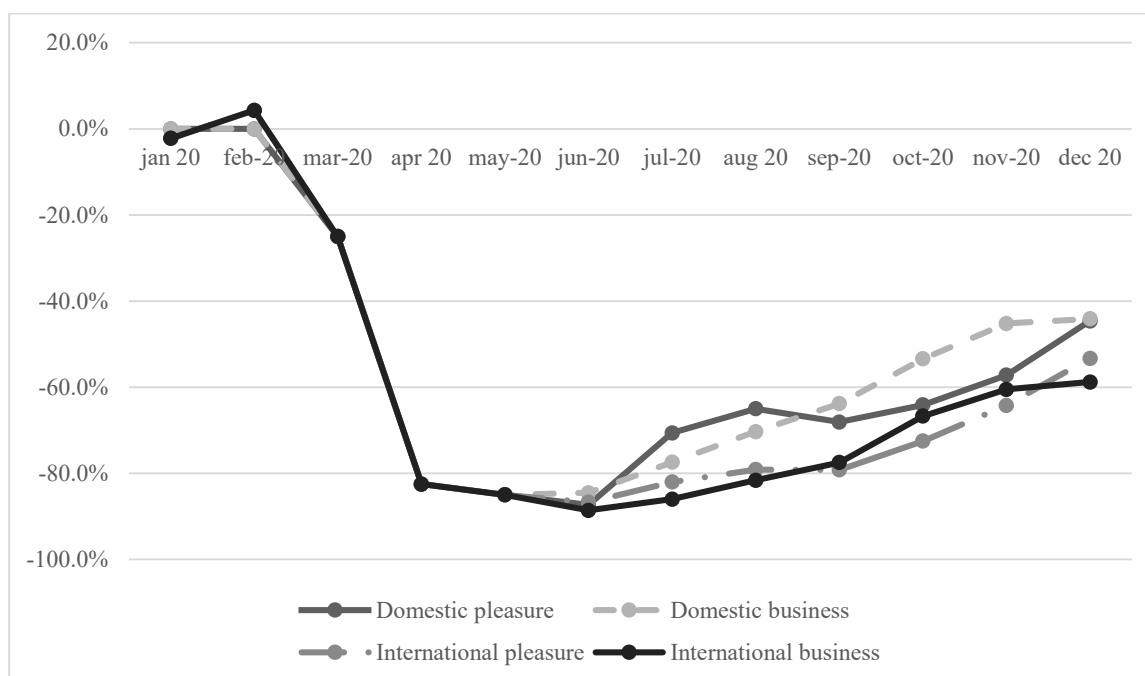
As table 2 shows, we forecast the recovery of the international market will proceed at a slower pace, with the market falling by 80% in June, and almost 90% if the correction we propose is ignored. Our forecast is for a return to 67.5%

of 2019 business value, with a mean expectation from the survey at less than 50% by December, in both the pleasure and the business markets.

Table 2: Estimation of the Inbound Market Recovery Rate, Leisure and Business Segments. Monthly Market Size Expected in 2020 as a Percentage of 2019 Market Size in the Same Month

Month	Pleasure			Business			Weighting by segment. Pleasure: 91.3% Business: 8.7%
	Mean	Standard deviation	Mean + Standard deviation	Mean	Standard deviation	Mean + Standard deviation	
June	13.3%	7.1%	20.4%	11.4%	5.3%	16.8%	20.1%
July	18.0%	8.7%	26.7%	14.0%	7.0%	21.0%	26.2%
August	20.9%	14.8%	35.7%	18.4%	10.2%	28.6%	35.1%
September	20.8%	17.2%	38.1%	22.5%	12.2%	34.7%	37.8%
October	27.5%	17.1%	44.6%	33.3%	15.7%	49.0%	45.0%
November	35.8%	16.8%	52.6%	39.5%	17.5%	57.0%	53.0%
December	46.7%	21.5%	68.1%	41.2%	20.0%	61.2%	67.5%

Source: Private sector survey.



Source: Private sector survey and own model.

Graph 1: Estimation of the Recovery Rate – Domestic and International Markets (Pleasure and Business)– Variation vs. Same Month of 2019

Results of the Application of the Model

Table 3 presents a summary of our forecast for the main tourism aggregates in 2020, following our two fold approach, anchored

on our survey results for the demand forecasts (June-December) and other sources (January-May) and the econometric relationships for the GDP and employment results.

Table 3: Main Macroeconomic Results Mexican Pesos at Current Prices. Millions

	2019	2020	Variation	Variation %
Total tourism consumption	3,271,146	1,659,437	-1,611,709	-49.3
International inbound tourism consumption	472,589	227,350	-245,239	-51.9
Domestic tourism consumption	2,798,557	1,432,087	-1,366,470	-48.8
Tourism GDP	1,917,019	1,076,165	-840,854	-43.9
Share of tourism in GDP (%)	8.6	4.9	-3.7	--
Employment in tourism (millions)	4.1	3.0	-1.1	-27.4

Source: Own estimates.

The results of this exercise point to a dramatic year on year contraction of tourism demand and GDP, with devastating consequences on employment levels in the travel and tourism industry. The results are given in Mexican pesos and it must be remembered that the local currency is expected to lose about 15% of its value in USD on average over the present year, with the exchange rate going from 19.4 pesos per USD on average in 2019 to slightly over 22 pesos on average for 2020 which means that, measured at current prices in pesos, the fall in tourism consumption accounted for by inbound tourists will be somewhat mitigated.

A Preliminary Appraisal of the Accuracy of the Business Survey

The business survey was conducted in May; at the time of writing this paper, the availability of some sources allows us to have an initial insight into the precision of the views expressed in the survey, and hence, of the usefulness of this kind of tool as a guide for short run forecasts of tourism activity. The following tables present a comparison of our forecasts and some of the recently released indicators,

grouping them only by market origin leaving aside trip motives for lack of information.

Table 4: Domestic Market. Forecasts variations

Month	Actual data	Forecast	Difference % points	Forecast without correction	Difference % points
Jun-20	11.1%	18.0%	6.9	15.5%	4.4
Jul-20	26.5%	41.5%	15.0	22.6%	-3.9

Source: Private sector survey, and own model. For actual data: Ministry of Tourism (SECTUR) statistics on hotel occupancy.

Table 5: Inbound Market. Forecasts Variations

Month	Actual data	Forecast	Difference % points	Forecast without correction	Difference % points
Jun-20	9.7%	20.1%	10.4	13.2%	3.5
Jul-20	21.5%	26.2%	4.7	17.7%	3.8

Source: Private sector survey and own estimates. For actual data: NISG, Survey of International Travelers (SIT) and Border Travelers Survey (BTS).

The chaotic characteristics of this pandemic involve enormous uncertainty in a large number of areas of human life, and the travel and tourism industry is no exception, having been subject to an exogenous demand and supply shock of unprecedented magnitude which brought it to a virtual halt in the second quarter of this year.

Bearing this in mind, it would seem that the business surveys are a very reasonably useful tool to probe the short run evolution of the travel and tourism industry. In the case of the domestic market the raw, uncorrected, mean survey values provide a fair approximation to the real situation as measured by the number of domestic tourists arriving in hotels. At least for these two months, it would seem that expanding the mean survey values by one standard deviation, as we did in our model, is not warranted. Yet these results only reflect the arrivals of tourists to formal accommodation establishments and we will have to wait until the NISG publishes data for domestic tourism consumption as measured in the TSA framework to know the actual value of the domestic market. As for the inbound tourism segment, where the actual data is derived from direct surveys of international travelers and from immigration authorities, it would seem that imposing one standard deviation on the mean survey estimate is not appropriate, perhaps because more than 85% of international tourism expenditure is done by visitors who are part of the market monitored by business leaders. In both cases, however, the preliminary data presented in tables 4 and 5 suggest that even under extremely volatile conditions, such as those of the pandemic, in which other methods face severe limitations business surveys can be of help in assessing short term prospects for the industry.

CONCLUSIONS

The effects of the COVID-19 pandemic, in addition to causing enormous damage to human health⁴, is having a profound impact on the economy and, especially, on travel and tourism. In addition to the direct effects resulting from the contraction of tourist flows due to the limitations imposed on human mobility, the depth of the shock will most likely mean structural transformations in the tourism industry.

The impact on Mexico's tourism industry will be enormous in the short run. This makes the apparent lack of interest on the part of the authorities all the more regrettable. Given the importance of tourism in Mexico, and especially in the times to come that will demand innovative public policies to assist the rapid recovery of the industry, it is necessary to insist on making the positive effects of tourism widely known while at the same time warning of the threats and challenges it faces.

The current crisis offers an opportunity to explore different lines of research, one of which is that of forecasting its social and economic effects. In the review of recent literature, there is not much to be found in terms of relevant experiences or methods to forecast the economic effects of an exogenous shock such as the one brought about by the pandemic. We have argued for a method based on tapping the direct knowledge of the market by the relevant actors and early, yet very preliminary evidence suggests that this is a fruitful road to explore. It remains, of course, to be seen whether these promising results remain in place as we move further into the future as the deviations from the mean values in the

⁴ Up to now (September the 28th, 2020), one million deaths have been exceeded with more than 33 million cases in the world.

survey increase.

With the application of our methodology, we anticipate that the contraction in tourist consumption in Mexico could reach an amount of more than 700 billion dollars, leading to a 44% fall in tourism GDP and a loss of around one million jobs.

The greatest challenge identified in adding precision to the estimates, so far, is that of the non-market part of tourism demand that in the domestic sphere is related to trips to visit family and friends and other similar reasons, and in the international component—in the case of Mexico—is referred to activities in the border.

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