



## **FISCAL POLICY EFFECTIVENESS IN MANAGING ECONOMIC RECESSIONS AND RECOVERIES**

---

**DR. P.S.LAKSHMI**

**LECTURER IN ECONOMICS**

**GOVERNMENT DEGREE COLLEGE, ANANTHAPURAMU**

---

### **ABSTRACT**

*Economic analysis of the tourism industry is a critical tool for local industries and governments to estimate, understand, and forecast the tourism potential and economic performance of a destination, especially amidst a crisis such as the COVID-19 pandemic. In this study, we take Macao as a case study, perform an analysis using an input-output framework. By constructing a tourism satellite account and a dynamic stochastic general equilibrium model, we estimate the contribution of the tourism industry to the economy of Macao and assess the ramifications of several government policies to mitigate the impact of COVID-19. Our findings provide the Macao government and local industrial stakeholders with critical information for pandemic mitigation and recovery strategies.*

**Keywords:** Fiscal Policy, Economic, Recoveries

### **INTRODUCTION**

The economy witnesses a complete crisis, like the one throughout the pandemic, alongside government, aggregated debt at an alarming level, central banks operationalizing traditional monetary policies in a zero reduced bound ecology. At the same time, the macroeconomic impacts of these policies can't be evaluated within the environment of conventional macroeconomic models. Within this research piece, we examine fiscal policy interplay within a phase that comprises the world's financial crisis of 2008 as well as an aspect of the pandemic crisis. To do this, we ease the presumptions that policy situations are rigid and take to approximate interest percentage regulations for monetary policy and tax regulations for fiscal policy that varies randomly among dual regimes. Next, we apply a novel structural vector autoregression equation, suggested and used to examine the impacts of fiscal.

For example, the value of 83 billion US dollars was formulated to aid job seekers who witnessed a fall in earnings owing to the coronavirus, by giving a subsidy to cover aspects of employee remuneration. COVID emergency fund for example, Canada Emergency Response Benefit (CERB), the amount of \$83B, was formulated to assist those who are not working due to the pandemic correlated activities and those who exhausted their regular employment Insurance benefits, while the total quantum of \$23B was devoted to give earnings to assist those working and self-employed Canadians explicitly impacted by the pandemic plus those not eligible for employment income. The implementation of monetary policy might vary across nations regarding their economic circumstances throughout the ongoing COVID-19. contended that the performance of monetary policy by the developing countries in reaction to the

pandemic might not be efficient due to over volatility in exchange rates and capital movement. But, developing countries can implement an amalgamation of inflation managing approaches and macroprudential instruments plus forex reserve aggregation as their policy models to manage the variations in capital movement and exchange rates.

Considering that this policy framework encourages stability in the financial sector, the emerging countries can implement similar policies to react to the disruptions caused by the pandemic. The nations with huge forex reserves can manage their currency devaluation by interrupting their foreign exchange market circumstances. Since the pandemic correlates with reduced inflation in developed nations, growth monetary policy could encourage high-level economic expansion and financing. The world's monetary policy and its headwinds significantly ascertain circumstances. Expectedly, the implementation of monetary policy in the industrialized countries impacts the developing countries; monetary policy actions. Further, the purposes of trade and investment globalization engender headwinds diffusion plus causes anxiety about a financial pandemic.

As a result, the efficiency of the domestic monetary policy will rely on headwinds spread across industrialized countries. So, the crude oil markets can see adverse supply and demand downturns throughout the pandemic phase. The cuts in the workforce supply, travel bans, and interruptions in transport plus business, explicitly and implicitly, led to an adverse supply interruption. The adverse demand slump is occasioned by economic challenges and the interruption of global value chains, limiting crude requirements. These adverse headwinds on the crude limit global spending and financing. Many studies have attempted to tackle the impacts of the pandemic on crude costs. Confirmed that the pandemic adversely impacted the energy industries. Noted that market doubts could forecast energy market vulnerability. Discovered that the pandemic cases and deaths expanded crude vulnerability and significantly influenced crude costs. Also, noticed a direct correlation between the net crude importation and exporting nations.

### **Fiscal Policy**

Fiscal policy is the means by which the government adjusts its budget balance through spending and revenue changes to influence broader economic conditions. According to mainstream economics, the government can impact the level of economic activity, generally measured by gross domestic product (GDP), in the short term by changing its level of spending and tax revenue.<sup>1</sup> Expansionary fiscal policy—an increase in government spending, a decrease in tax revenue, or a combination of the two—is expected to spur economic activity, whereas contractionary fiscal policy—a decrease in government spending, an increase in tax revenue, or a combination of the two—is expected to slow economic activity. When the government's budget is running a deficit, fiscal policy is said to be expansionary: when it is running a surplus, fiscal policy is said to be contractionary. From a policymaker's perspective, expansionary fiscal policy is generally used to boost GDP growth and the economic indicators that tend to move with GDP, such as employment and individual incomes. However, expansionary fiscal policy also tends to affect interest rates and investment, exchange rates and the trade balance, and the inflation rate in undesirable ways, limiting the long-term effectiveness of persistent fiscal stimulus. Contractionary fiscal policy can be used to slow economic activity if policymakers are concerned that the economy may be overheating, which can cause a recession. The magnitude of fiscal policy's effect on GDP will also differ based on where the economy is within the business cycle—whether it is in a recession or an expansion.

## OBJECTIVE

1. Examine the impacts of various policies through simulations of the DSGE model; and
2. Assess the effectiveness of these various policies accordingly.

## METHOD

Based on data published by the DSEC (2020b), Macao's industries fall into 17 categories: mining and quarrying; manufacturing; electricity, gas, and water supply; construction; wholesale and retail; hotels and similar activities; restaurants and similar activities; transport, storage, and communications; banking; insurance and pension funding; real estate activities; renting and business activities; public administration; education; health and social work; gaming and junket activities; and other community, social, and personal services. This study compiles the input-output table of Macao using the non-survey method. According to the characteristics of Macao's industrial structure and the existing statistical data, the number of sectors in the input-output table is further extended and determined to be 22. In particular, "manufacturing sector" is further specified into six sectors, namely food and beverage manufacturing, textile, clothing, media and printing, cement and concrete, and other unspecified manufacturing sector. "Electricity, gas, and water supply" is further divided into two sectors such as the production and distribution of electricity, gas, and steam, and the production and distribution of water.

The main compiling ideas are: based on the available sectoral data in the Macao Statistical Yearbook, the inter-industry technical coefficient of Macao in the EORA26 database (26 sectors in 2015), and the coefficient of the input-output table of the neighbouring Guangdong Province (142 sectors in 2017), we used RAS method to calculate the input-output table of Macao in 2018. The process of constructing the I-O table is as follows: (1) collecting sectoral data on total output, initial input (value added), and intermediate consumption from the statistical yearbook; (2) on the basis of sectoral structural ratio from the statistical yearbook, the total data of the sub-item (final use) in the GDP accounting of expenditure method is allocated to each sector. Meanwhile, the sectoral total intermediate use can be obtained according to the relationship "intermediate use + final use = total output"; (3) EORA26 shows the technical coefficient between 26 sectors in Macao, which is used as the initial value of the intermediate flow coefficient of the same and similar sectors in the input-output table designed by us, while the initial value of the coefficient of the missing or different departments is replaced by the technical coefficient of the similar sectors in the input-output table of 142 sectors in the neighbouring Guangdong Province the intermediate flow matrix between sectors calculated by the RAS method is combined with the initial input and final use matrix to form a standard form of an input-output table; (5) testing the balance of the constructed I-O table and adjust accordingly.

Following the guidelines of the Input-Output Tables of China (National Bureau of Statistics of China, 2012), the final I-O table for Macao includes five sections: (1) total output, which is the value of all goods and services produced by Macanese residents (including both newly created and intermediate products) and the value of fixed assets transfer; (2) intermediate investment, which is the value of all non-fixed assets and services used in the production processes of local residents; (3) value added, which reflects the added value created during the production process, such as employee compensation, operating surplus, and taxes on production; (4) intermediate demands, which refers to the value of all Table non-fixed assets and services required in the production processes of local residents; and (5) final demand,

which includes the final consumption expenditure within Macao. The constructed I-O table for the Macao economy reflects the interrelationship among various sectors and serves as a basis for subsequent analyses of the TSA and the general equilibrium model. Table 1 illustrates the sample structure of the constructed I-O table for the Macao economy. The complete version of the IO table is presented in the Appendix.

## RESULT

The Macao SAR government publishes an annual TSA to outline the contributions of the tourism industry to the Macao economy. Although the published results provide rich information, the methodology is limited in scope and rigor. The construction of the TSA of Macao involves investigations on both the demand- and the supply-sides, with the interrelationships among the sectors derived from the I-O table, however, the official TSA generated by the government of Macao focuses on primary data from the demand- and supply-sides without a thorough examination of the I-O framework. This creates several drawbacks. First, the official TSA includes only a limited number of sub-sectors of the tourism industry, specifically gaming, retail, dining, accommodation, transportation, and travel agencies. Other related sub-sectors, such as insurance, the postal service, sightseeing, and leisure activities, are not considered. Second, the official TSA does not include the I-O table and as such, neglects the interrelationships between tourism and non-tourism industries. Consequently, the TSA overestimates or underestimates the economic contributions of the tourism industry.

Through this study, we intend to complement the official TSA generated by the government of Macao and emphasise the demand-side data. A tourist expenditure survey was conducted through a professional marketing research company in December 2021. A total of 4000 invitations were sent with 1011 valid responses received. Of the responses, the survey included 750 responses from the Chinese Mainland, 208 responses from Hong Kong SAR, and 53 responses from Taiwan, China. The structure of the sample was largely reflective of the source market structure of the inbound tourism market of Macao. The target respondents were individuals who travelled to Macao in 2019. The survey questionnaire asked the respondents about their travel experience in Macao, and specifically to report their total expenditure during their trip as percentage shares of different categories. The categories included expenditure on travel agencies outside of Macao, travel agencies within Macao, transportation, accommodation, food and beverages, gaming, admission to attractions, entertainment activities, and shopping. Several of these categories had subcategories with further question subdivisions. For example, the survey asked the respondents to declare the shares of transportation expenditure for buses, taxis, rental cars, and fuel; the shares of admission fees to attractions for natural attractions, cultural attractions, and other exhibitions; and the shares of entertainment spending for theme parks, artistic performance, golf, and other activities. This study triangulated the accuracy of the survey data by comparing the aggregated expenditures of different categories with government released reports and statistics (DSEC, 2020a). Given that the proportions of most major expenditure categories (e.g., shopping, accommodation, food and beverage, and transportation) reflected the government data, we conclude that the survey data have a high degree of accuracy in describing the expenditure allocation of tourists travelling to Macao before the COVID-19 pandemic.

Visitors' direct consumption within a sector is calculated using the survey data and the government statistical data. These consumption values constitute the direct contribution of tourism to this specific

sector and the economy. The indirect contribution of tourism to the economy arises from the interrelationship among various sectors. That is, in order to satisfy tourism demand, the destination economy not only needs to produce the corresponding goods for final consumption, but also is required to produce the intermediate products that would be utilized throughout the production process. A tourism ratio statistic can be calculated by dividing the total contribution of tourism in a sector to the total volume of production in that sector, which describes the reliance of certain sector on tourism activities (Table 2). The tourism ratio of the gaming sector is the highest at 81%, followed by the passenger transportation sector at 73%, retail at 67%, food and beverages at 68%, and accommodation at 53%.

Table 2 Tourism ratio by tourism goods and services.

Category	Tourism ratio	
	Our estimates	Government TSA
Gaming	81%	98.7%
Passenger transportation	73%	66.2%
Retail	67%	52.5%
Food and beverages	68%	47.8%
Accommodation	53%	43.3%
Banking	1%	-
Insurance	4%	-
Postal service	10%	-
Non-tourism products	1%	-

The TSA results of this study are cross-referenced against the official TSA published by the Macao SAR government. Although the results for most sectors are close, there are discrepancies in the results for some sectors. For example, the tourism ratio of the gaming sector is approximately 81% by our estimation, whereas the government estimate is as high as 98.7%. According to our estimation, the tourism ratios of the food and beverages and the accommodations sectors are 68% and 53%, respectively, but the government figures are 47.8% and 43.3%, respectively. These discrepancies can be attributed to methodological differences. For instance, the government TSA relies on primary data from the demand and supply sides, which overestimates some of the transactions that flow through gaming operators and travel agencies and underestimates the interrelationship among sectors. In contrast, we complement the government's TSA by investigating the structure of the economy within an I-O framework. One drawback of this approach is the difficulty in reaching VIP gamblers through a regular survey – and their contribution to gaming revenue is substantial in Macao. This methodological limitation is likely the reason for our low tourism ratio for gaming.

### Impulse response

To investigate potential relief policies amidst the COVID-19 pandemic, we ran a baseline simulation and two policy simulations using the DSGE model established in the previous sections. The baseline simulation reflects the trend of the variable under the shock of the COVID-19 pandemic, and the simulation results show a 65% decrease in GDP, which is similar to the actual situation in Macao during the pandemic. Fig. 2 shows that the health shock leads to a significant drop in GDP, tourism consumption, and exports, whereas there is a short-term increase in consumption resulting from panic purchasing. There

is a significant drop in productivity in both the tourism and nontourism sectors, along with a decrease in employment in both sectors. It takes approximately 5 periods (years) for the economy to see considerable recovery and approximately 10 periods for the economy to recover to a steady state once the health shock is relieved, with the majority of the variables converging back to their pre-shock levels. In our model, the recovery to steady state segment is not the same as the recovery to the pre-COVID-19 level. Given that the economy of Macao was experiencing a growing trend powered by innovation in productivity in 2019, the recovery in Figs. 2, 3 and 4 refers to a state that

**Table 3**

Steady state values in the DSGE model.

Indicator	Variable	Value
cs	share of consumption	0.358
i_s	investment steady state	0.211
yts	share of tourism GDP	0.72
us	unemployment rate	0.019
cts	share of tourism consumption	0.358
cnt_s	share of non-tourism consumption	0.114
cps	share of public sector consumption	0.241
cm s	share of imports	0.336
cmts	share of tourism imports	0.077
cmnts	share of non tourism imports	0.259
exts	share of tourism exports	0.014
exnts	share of non tourism exports	0.294

Note: These values are calculated from macro data and TSA aggregates

assumes the COVID-19 pandemic did not occur. A significant drop in tourism consumption is observed at the initial stage of the pandemic. This is due to the absence of foreign tourists because of border control policies and cautious behaviour by local residents. Nonetheless, local residents would allocate their income to nontourism consumptions to maintain a certain level of utility. Tourism consumption sustains the economy only for a couple of years and starts recovery sooner than other variables. This is due to the change in consumption bundles of local residents. In reality, due to the combined force of government consumption vouchers and effective promotion of staycation packages, Macao residents benefited from

local tourism activities, which mitigated the loss of tourism revenue due to the border lockdown. In terms of employment, the drop is far more severe than the unemployment rate of around 3% to 4% that was present in Macao throughout the pandemic. Nevertheless, employment in our model assumes representative households with similar endowments and without differentiation in terms of positions and rankings. Since the beginning of the pandemic, the integrated resorts in Macao dismissed many medium-to-high ranking managers to keep the lower ranking employees within the firm. These medium-to-high ranking managers should be translated

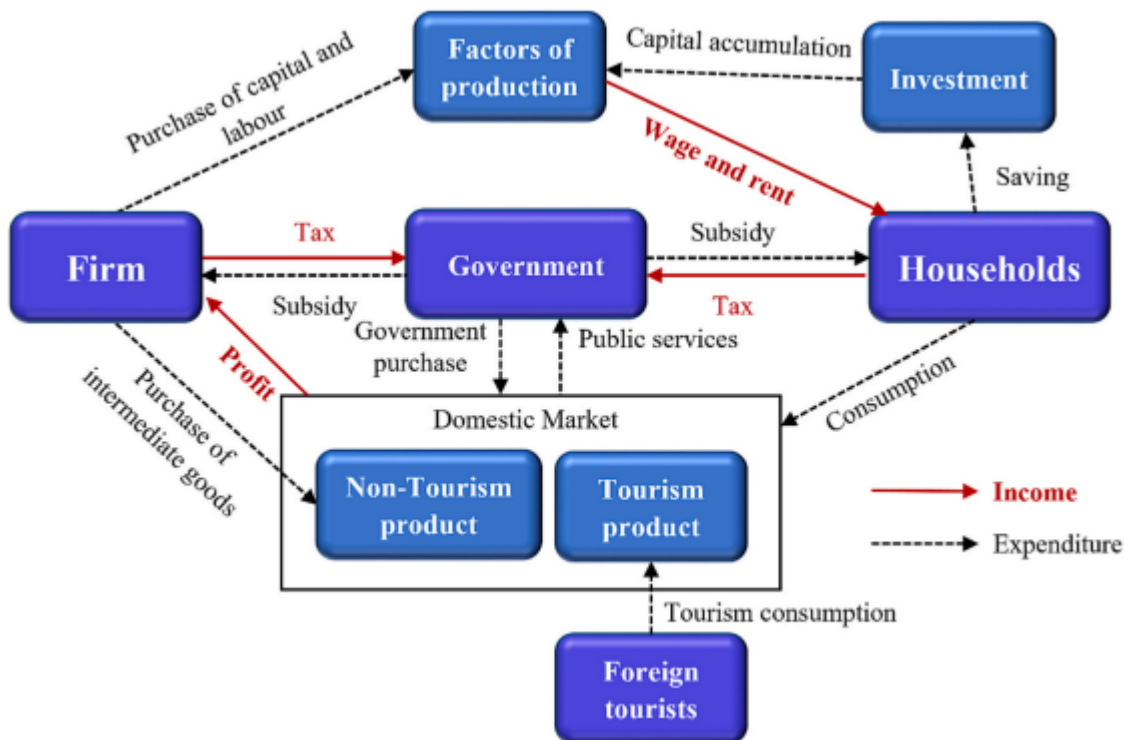


Fig. 1. Circular flowchart of the model.

into multiple representative employees in the model due to their original high income and consumption levels. Alternatively, if the integrated resorts kept these medium-to-high ranking managers and dismissed lowlevel employees, the unemployment statistics would have been much worse. The first policy simulation considers a tax reduction, which supports businesses by reducing their tax liability. In the impulse response analysis, the tax reduction shock was simulated empirically by reducing the tax rate imposing on firms specifically. This simulated policy will then affect key variables in the economic system, including GDP, consumption and firm-level productivity (i.e., tourism and non-tourism), which further influence the overall tourism contribution to the economy. The shock of the tax reduction on firms is simulated through a 20% decrease in the tax rate in the system.

**CONCLUSIONS**

In this study, we explored the tourism sector of Macao during the COVID-19 pandemic by establishing a DSGE model. First, we generated an I-O table and a TSA to support the construction of the DSGE model. Second, we ran two policy simulations to investigate the potential of different policies for mitigating the severity of the impact of COVID-19 and to speed up the recovery of the tourism industry

and the economy after the pandemic. Through our simulations, we found that both tax reduction and financial subsidies for local residents do not facilitate a quick postpandemic recovery. Other policy measures should be considered to facilitate a quicker recovery. Against the severity of the COVID-19 pandemic and its enormous impact on Macao's economy, stimulation from the demand-side is not enough for a quick recovery. Supply-side policies, such as offering employment support and support to the capital chain, should be considered for reviving businesses and accelerating economic recovery. While the simulated policies do not facilitate a quick recovery, the financial subsidy showed a significant mitigating effect on the severity of the impact of the COVID-19 pandemic. From an economic perspective, financial subsidies would allow all residents in Macao to maintain an economically significant level of consumption. Limiting the subsidy to a period-wise use (e.g., residents can use a fixed percentage of the total subsidy per week) can further smooth the consumption pattern. This solution is currently in use in Macao and consumption subsidies have proven effective in many other scenarios. In contrast to financial subsidies, the effectiveness of tax reductions is limited. In a health crisis situation such as the COVID-19 pandemic, a significant drop in employment is unavoidable, and occurred both in our simulation and in reality. Therefore, tax reductions help only those who remain employed, and the amount of disposable income provided by a tax reduction increases monotonically with a resident's income. In essence, the support provided is distributed unevenly, with the tax reduction subsidy rendering more help to residents with less need for it, whereas unemployed residents are trapped at a relatively low consumption level without benefitting from the policy. Furthermore, in practice, a tax reduction is often implemented as a tax rebate at the end of the year, which does not have an instant and smoothing effect on mitigating the impact of the COVID-19 pandemic.

## REFERENCES

1. Akrof MMC, Antwi SH (2020) COVID-19 energy sector responses in Africa: A review of preliminary government interventions. *Energy Res Soc Sci* 68:101681
2. Anh DLT, Gan C (2020) The impact of the COVID-19 lockdown on stock market performance: evidence from Vietnam. *J Econ Stud.* <https://doi.org/10.1108/JES-06-2020-0312>
3. Azad NF, Serletis A, Xu L (2021) Covid-19 and monetary-fiscal policy interactions in Canada. *Q Rev Econ Financ.* <https://doi.org/10.1016/j.qref.2021.06.009>
4. BabatopeTaiwo I, OlatunjiOlaoye C, Adekola Dada R (2021) The roles of SMEs on the sustainable economy growth after Covid-19 pandemic in Nigeria. *J Bus Theory Pract.* <https://doi.org/10.22158/jbtp.v9n2p79>
5. Batool M, Ghulam H, Hayat MA et al (2021) How COVID-19 has shaken the sharing economy? An analysis using Google trends data. *Econ Res Istraz.* <https://doi.org/10.1080/1331677X.2020.1863830>
6. Bordo MD, Levy MD (2021) Do enlarged fiscal deficits cause inflation? The historical record. *Econ Af.* <https://doi.org/10.1111/ecaf.12446>
7. Büyükbaşaran T, Çebi C, Yılmaz E (2020) Interaction of monetary and fiscal policies in Turkey. *Cent Bank Rev* 20:193–203. <https://doi.org/10.1016/j.cbrev.2020.03.001>



8. Caballero-Morales SO (2021) Innovation as recovery strategy for SMEs in emerging economies during the COVID-19 pandemic. Res Int Bus Financ. <https://doi.org/10.1016/j.ribaf.2021.101396>
- Camous A, Claeys G (2020) The evolution of European economic institutions during the COVID-19 crisis. Eur Policy Anal. <https://doi.org/10.1002/epa2.1100>
9. Deardorf A, Kim S, Chung C (2020) The global economy after COVID-19. East Asian Econ Rev. <https://doi.org/10.11644/kiep.eaer.2020.24.4.381>
10. Doruk ÖT, Konuk S, Atici R (2021) Short-term working allowance and firm risk in the post-COVID-19 period: novel matching evidence from an emerging market. Financ Res Lett. <https://doi.org/10.1016/j.frl.2021.102021>
11. ElFayoumi K, Hengge M (2021) Capital markets, COVID-19 and policy measures. IMF Work Pap. <https://doi.org/10.5089/9781513569413.001>
12. Elyassi H (2021) Economics of the financial crisis: any lessons for the pandemic downturn and beyond? Contemp Econ. <https://doi.org/10.5709/ce.1897-9254.438>
13. de España B (2020) Reference macroeconomic scenarios for the Spanish economy after Covid-19. Analytical Articles. Economic Bulletin, Banco de España (2/2020):1–32