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Measuring the Multiplier Effects of Tourism industry to the Economy

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Abstract

The discussion and the empirical investigations presented in this article are part of the goal to implement the specific actions necessary for the economic evaluation of the impacts of tourism based on the conceptual and methodological standards of Tourist Satellite Accounts (TSAs) as formalised by the World Tourism Organisation (WTO), the United Nations Statistics Division and the OECD. First, we summarise the essential concepts and definitions relating to the macroeconomic impact of tourism; then, we offer a brief summary of the corpus of literature dedicated to assessing the importance of the tourism industry in the economies of the French Overseas Departments, in particular in the case of Guadeloupe. Secondly, we demonstrate that the theoretical framework of SAM modelling provides a particularly appropriate approach to conducting a detailed analysis of the repercussions of tourism in terms of its direct, indirect and induced effects across the various branches of the economy. Since Guadeloupe does not at present have an official system of Tourism Satellite Accounts, we propose to adopt the Social Accounting Matrix (SAM) as an alternative approach in order to establish results capable of filling this information deficit. Alongside the macroeconomic analyses of TSA-type tourism activities that have been conducted for Réunion and Martinique, and also alongside the TSA development programmes currently in progress for various CARICOM countries, the studies presented in this contribution are intended to offer elucidation of a similar nature on the measurement of the impact of tourism on the Guadeloupe economy.

JEL classification numbers: L83
Keywords: Impact of tourism, input-output table, social accounting matrix, tourism satellite account

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1 Introduction

Since the advent of the democratisation of the phenomenon of international air transport, it has become increasingly rare to find a country or a sub-national region that is not taking steps to implement a tourism development strategy.
In wealthy countries, tourism undeniably constitutes an arena for international competition. Today, the European Union holds the number one position with a tourism sector that generates over 10% of its GDP and employs 9.7 million people distributed across 1.8 million undertakings. In the United States, it contributes significantly to GDP and represents a key sector in total exports of goods and services. Every year, the media delights in giving rundowns of the world's top most visited cities and have also started to offer rankings according to other criteria.

In very many developing countries, for some years now we have also seen a greater recognition of the role that ought to be played by tourism as a driver of development, being as it is a source of foreign currencies and a support for activities that generate revenues and jobs. On the African continent alone, for example, World Tourism Organisation (WTO) data reports 63.6 million international tourists for 2012 compared with 17.4 million in 1990. Even though the distribution of gains between the countries is very unequal, the fact nevertheless remains that their macroeconomic impacts are considerable. For the leading beneficiary countries, receipts from international tourists reach amounts that represent double the national GDP of some States: in 2012, these receipts stood at $9.94 billion for Egypt and $6.711 billion, $2.183 billion and $1.564 billion respectively for Morocco, Tunisia and Tanzania; for the same year, the GDP of Barbados reached US$5 billion, that of Haiti US$7.2 billion, and that of the Bahamas US$8 billion. Likewise, taking such eclectic examples as Senegal, Niger, Malta, Afghanistan and Laos, they report respective GDP figures of US$14 billion, US$6.8 billion, US$8.8 billion, US$20.4 billion and US$9.1 billion. These few example show quite clearly that tourism occupies a position as one of the most important sectors of national economies, showing itself to be a driver of wealth creation.

But the economic literature is not solely restricted to publications highlighting the positive roles of international tourism. A number of authors have focused on examples of developing countries to deplore the low share of tourism expenditure that they receive, even where these countries see the number of international visitors growing more rapidly than their tourism receipts. In their paper on the measurement of the economic effects of international tourism in destination countries, Caire and Le Masne (2006) recalled the relatively concerning finding of the United Nations Conference on Trade and Development (UNCTAD): " tourism leakage is thought to be in the order of 85% in the LDCs of Africa, 80% in the

Caribbean, 70% in Thailand, 40% in India and between 10% and 20% for the most advanced and diversified developing countries (such as Mexico)."

Of course, these figures have not been without controversy, due to the fact that they have been reproduced in numerous articles of the literature on the subject and they are contested because their methods of calculation are not known. However, since they reflect certain realities widely discussed in developing countries, they underscore the scale of the challenges to be overcome by policymakers if they are to ensure that tourism is a sector that provides significant benefits for their domestic economies and their populations. It was with this in mind that the UNCTAD launched the E-Tourism Initiative in 2004, designed to help developing countries to deploy strategies and public policy actions to minimise the leakage of tourism receipts that they were experiencing.

In the light of all the figures cited above and the challenges arising from their implications, there is an indisputable lesson to be drawn: the undoubted necessity for government leaders to have at their disposal reliable measurements of the tourist activity in an economy.

More than ever before, this requirement is essential for Guadeloupe. A plethora of findings and arguments can easily be cited to highlight the fact that regular observation of tourism activity and its economic impacts are core needs for a multitude of actors. Firstly, the needs of policymakers with responsibility for steering tourism policy at both national and local level. Without question, through their discourse and acts the public authorities demonstrate that they are acutely aware of the strategic role to be played by the tourism sector in the Guadeloupe economy, and its potential in particular. Secondly, international bodies and partners of Guadeloupe in the processes of regional cooperation. To give just one - yet utterly typical - example, this is illustrated by the publications of the Caribbean Tourism Organization (CTO) which give no information on Guadeloupe whereas they offer an assessment of the tourism economy in the various territories of the Caribbean Basin, allowing comparison between them as well as change monitoring over long periods.

The primary objective of our analysis is to provide a methodological tool for the quantification of the economic significance of the branch of activity constituted by tourism in a small island economy such as that of the Guadeloupe Archipelago. On the basis of the conceptual framework of Social Accounting Matrices (SAMs), we propose an examination of the interdependence of the tourism sector with the economic circuit as a whole, highlighting the main transaction flows between agents. In so doing, we intend to extend the approach offered by input-output tables (IOTs) commonly used in the French Overseas Departments and which consist in plotting the interactions between the productive branches of the economy by means of their intermediate consumptions. Our SAM-based tourism

modelling exercise also offers a means of describing the impact analysis in terms of multipliers and the calculation of benefit aggregation as well as the effects of exogenous expenditure on the economic circuit.

We will initially give an overview of the definitions and concepts developed in the literature for the measurement and evaluation of the economic impact of tourism, focusing in on the methodological framework of Tourism Satellite Accounts (TSAs). We then explain how the SAM can be deployed in order to derive tourism indicators and to establish estimates of the economic impact of tourism by distinguishing between the direct, indirect and induced effects. Thirdly, we present the results of our empirical applications, endeavouring to reconcile our "output indicators" with the list of indicators making up a TSA.

2 Satellite accounting methodology for the analysis of the economic impact of tourism

2.1 Definitions and concepts

On a subject as broad as tourism and a theme as complex as the economic analysis of tourism, the precaution of defining the semantic scope would appear to be a prerequisite for correctly focusing on the concepts addressed and the quantities measured. It is entirely natural, then, to turn to the similar exercises previously carried out in the literature. Professor Boris Vukonic, of the Utilus Business School for Tourism and Hotel Management in Zagreb clearly sets out this approach in his fine introduction to The Routledge Handbook of Tourism Research edited by Hsu and Gartner (2012):

“One of the significant interests of theorists was to define the tourism phenomenon itself, as theorists realised that the imprecise definition causes difficulties in thinking about tourism, in keeping statistical records, and in having a general understanding of tourism as a social phenomenon”.

Conducting a relatively concise yet meticulous review of the history of the theory of tourism, he offers a reminder that the definition of Hunziker and Krapf (1942) was among the first to be widely accepted at the time by experts and members of the International Association of Scientific Experts in Tourism (AIEST):

“We understand by tourism the sum of the relationships and phenomena arising from the travel and stay non-residents, insofar as they do not lead to permanent residence and are not connected with earning activity “

Now a societal reality within every nation and in international exchanges, tourism has constantly developed and has constituted a field of investigation in a multitude of disciplines. A phenomenon presenting critical economic issues in international competitiveness, it has mobilised the efforts of economists and governmental bodies in order to establish a common framework for its definition and the

concepts it covers. A relatively detailed presentation of the conceptual and methodological basis for the economic analysis of tourism is given on the website of the World Tourism Organisation - WTO. Among other things, it contains a glossary and "United Nations approved International Recommendations which establish the concepts, definition, classifications and the basic set of data and indicators that should be part of any national System of Tourism Statistics" (see the WTO website: http://statistics.unwto.org/).

> The definition of tourism used at international level today, and approved by the United Nations, is worded as follows:
> *"Tourism is a social, cultural and economic phenomenon which entails the movement of people to countries or places outside their usual environment for personal or business/professional purposes. These people are called visitors (who may be either tourists or excursionists; residents or non-residents) and tourism has to do with their activities, some of which imply tourism expenditure."*

In the Mediterranean Basin, the Indian Ocean or the Caribbean, tourist activities constitute a driver of the local economy for many countries and, specifically, their impacts vary widely according to the assets and weaknesses of the territories in question. As a consequence, the primary objective of the economic analysis of tourism is to identify and quantify the extent of the role of the economic effects of tourism on growth, GDP, employment etc. To achieve this end, the international community of experts has also provided clarifications concerning the terminology to be used to describe the components of the economic impact of tourism. As highlighted by Maurence (2010), economic impact studies are frequently structured around a breakdown into direct, indirect and induced impacts, but unfortunately the literature has long contained sometimes egregious nuances in the definition of these impacts and also in their methods of calculation (see Figure 1 by way of illustration). However, a comparative reading of various reports on this problem, and the concern to adhere to approaches implemented commonly at international level, permit of broadly assigning the following definitions and realities (Maurence (2010), Vellas (2011)) to direct, indirect and induced impacts:

	Certain studies in France	M.E.E.T.S. Canada	A.I.S.T.S. Switzerland
DIRECT impact	**Organiser Expenditure**	**Organiser expenditure + Visitor expenditure**	**Organiser expenditure + Visitor expenditure etc.**
INDIRECT impact	**Visitor expenditure**	**Repercussions linked to inter-undertaking exchanges**	**Repercussions linked to inter-undertaking exchanges**
INDUCED impact	**Repercussions linked to inter-undertaking exchanges**	**Repercussions linked to household consumption + Repercussions linked to investments**	**Repercussions linked to household consumption**

Figure 1: Examples of the use of the terms "direct", "indirect" and "induced" in approaches to the evaluation of short-term economic impact
Source: Eric Maurence (2010)

Direct impact: primary economic impact generated by the phenomenon under consideration in a territory as the result of the expenditure it occasions, in particular from purchasing and consumption effected locally by the visitors. In the case of tourism, the indirect impact is thus associated with the direct creation of wealth (essentially value added and taxes) through the activities of establishments connected with the tourism sector, activities and expenditure classified from the list of tourism characteristic products drawn up by the WTO and the OECD.

Indirect impact: impact resulting from the direct impact and representing the surplus of value injected into the local economy from the expenditure of undertakings and their employees.
The indirect effects of tourism relate to intermediate consumptions for the production of goods and services for the tourism sector. These are the goods and

services purchased by tourism undertakings from their suppliers, which constitutes the tourism supply chain. It is therefore important to encourage the tourism sector to procure locally-produced goods and services in order to maximise the economic impact of tourism receipts in a country or region.

Induced impact: impact consequential to the direct and indirect impacts and which results from the consumption of households on the basis of revenues distributed by undertakings having benefited from the activity in question. The induced effects of tourism thus correspond to the trickle-down effect from the successive expenditure of agents having benefited directly or indirectly from the initial expenditure of the tourism sector ("snowball" effect).

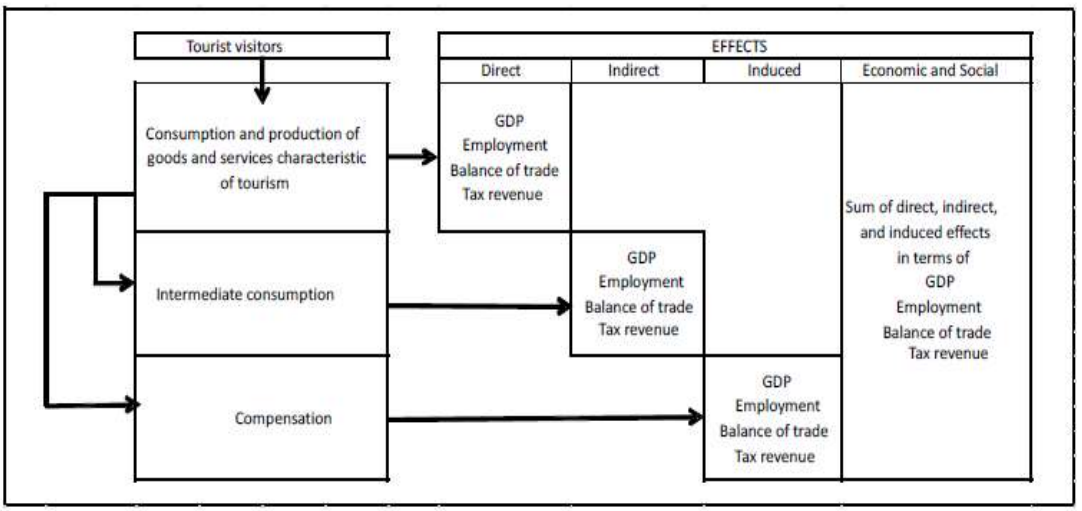

Figure 2 : Methodological framework of the indirect impacts of tourism
Sources: Marques (2012)

2.2 Tourism Satellite Accounts (TSAs)

Since the 1970s, the gradual rise of the tourism industry almost everywhere in the world, and the critical issues connected with awareness of its economic impacts, have mobilised a wide-ranging community of international institutions (UNESCO, World Bank, European Union, World Tourism Organisation etc.) and academic or private sector researchers, with the aim of constructing a system of Tourism Satellite Accounts (TSAs).

Given the fact that tourism, just like transport, environment or health, is a particular horizontal sector which is not fully represented in the system of national accounts (SNA), unlike sectors such as agriculture or trade, the need soon became apparent for the development of "satellite sub-systems" in order to be able to offer

a presentation framework for presenting the data on their economic activities, in relation to the overall economic analysis of the central framework of national accounts.

Thus, the Tourism Satellite Accounts serve as information additional to the central framework of national accounts for tourism activities, which are partially represented in the latter. Their aim is to cover in detail all aspects of the demand for goods and services associated with the activity of visitors, to trace the confrontation between this demand and domestic supply and to describe the interactions between this supply and the other components of the economy.

It was at the International Conference on Travel and Tourism Statistics, held in Ottawa in June 1991, that the first TSA prototype was presented by Stewart Wells on behalf of Statistics Canada. This document demonstrated the feasibility of the "technology transfer" consisting in implementing the principles of satellite accounts for the tourism industry. In the wake of the Ottawa conference, significant efforts and a whole series of initiatives at international level were also rolled out in the 1990s and 2000s in order to develop methodological approaches, tools and techniques designed to overcome the challenges involved in quantifying the contributions made by tourism to the economy, policies and programmes (see Kemp and Nijhowne (2004)).

The practical culmination of this movement of convergence of conceptual and methodological studies came with the approval of the document "Tourist Satellite Account (TSA): recommendations concerning the conceptual framework" by the Statistical Commission of the United Nations at its 31st session in March 2000. This publication now constitutes the main international reference for the development of a TSA and it provides a common language not only for the measurement of tourism but also its comparison with other sectors of the economy and its international comparability.

With regard to the content and the set of information provided by TSAs, a clear description is given in the introductory chapter of the report published by the United Nations in 2009 (page 18):
"The complete Tourism Satellite Account provides:

- Macroeconomic aggregates that describe the size and the direct economic contribution of tourism, such as tourism direct gross value added (TDGVA) and tourism direct gross domestic product (TDGDP), consistent with similar aggregates for the total economy and for other productive economic activities and functional areas of interest;

- Detailed data on tourism consumption, a more extended concept associated with the activity of visitors as consumers, and a description of how this

demand is met by domestic supply and imports; this data is integrated within tables derived from supply and use tables which can be compiled both at current and constant prices;

• Detailed production accounts of the tourism industries, including data on employment, linkages with other productive economic activities and gross fixed capital formation;

• A link between economic data and non-monetary information on tourism, such as number of trips (or visits), duration of stay, purpose of trip, modes of transport, etc., which is required to specify the characteristics of the economic variables,"

After these few reminders of the issues involved in TSAs and the history of their emergence, it is apposite to underscore the fact that since the late 1990s we have witnessed true international enthusiasm reflecting the desire on the part of a majority of countries across the world to have a TSA mechanism at their disposal. The list of TSA tables varies from one country to another depending on the availability of data on economic accounts and the constraints associated with the collection of additional statistical information. In fact, the development of a TSA calls, on the one hand, for the input-output tables of economic accounts and, on the other, for data derived from a variety of administrative sources and surveys. Taken together, this data must provide information on domestic tourism consumption by product and by type of tourism, on the production accounts of the tourism industries or on employment in the tourism industries. Figure 3 below illustrates the process implemented within Statistics Canada.

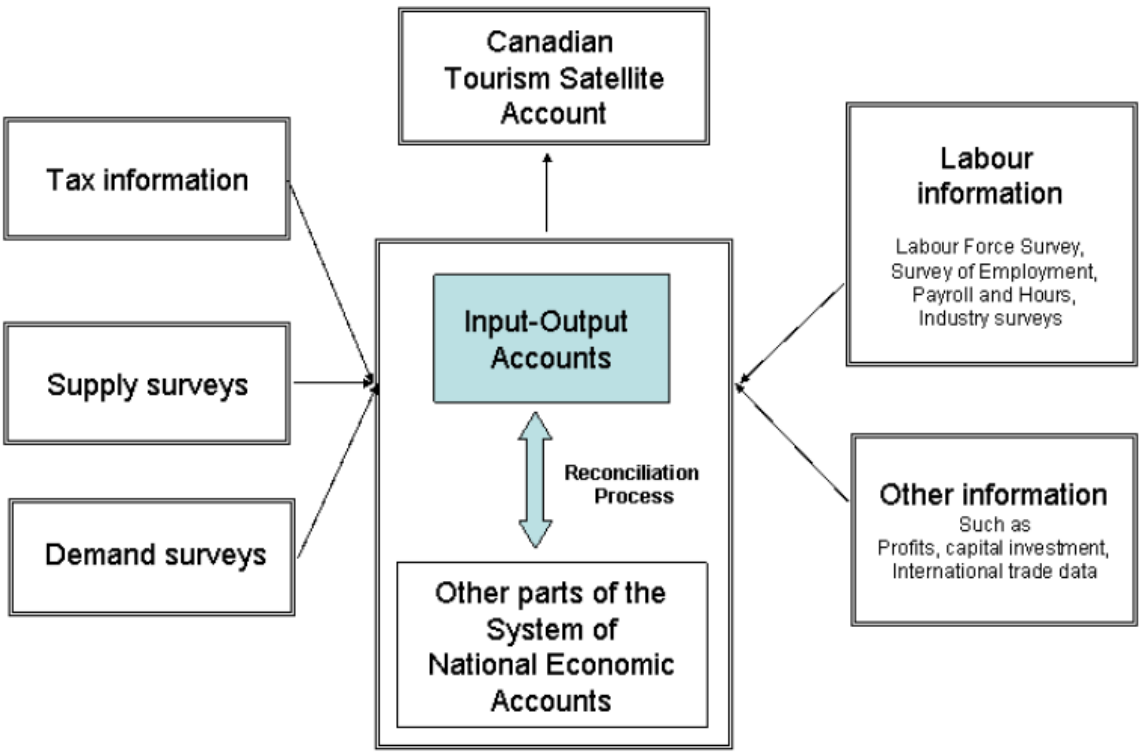

Figure 3: Data on the national economic accounts system used within the Tourism Satellite Account of Canada
Source: Statistics Canada (2007), page 24.

Overall, this set includes, first, tables showing the balance between supply and demand (domestic tourism consumption by product and by type of tourism, domestic tourism supply, production accounts of the tourism industries, tourism value added and GDP etc.) and tables showing employment in the tourism industries. To be even more pragmatic, a complete TSA is structured around the set of 10 summary tables (Table 1),

> "each one containing data and representing a distinct aspect of the tourism economic data: expenditure of inbound tourism, domestic tourism, outbound tourism and interior tourism, production accounts of the tourism industries, gross value added and gross domestic product (GDP) deriving from the tourism demand, employment, investments, consumption of public administrations and non-monetary indicators." (see the website of the WTO: http://statistics.unwto.org/).

In more detail, the set of 10 tables of the TSA is structured showing, in this order: the expenditure of tourism consumption associated with the various forms of tourism (Tables 1 to 3); the aggregates of domestic tourism consumption are calculated by totalling the non-monetary transactions that take place in the

national economy (Table 4); in turn, these can be compared with the supply of the domestic economy so as to provide a framework for analyses using an inputs-outputs structure (Tables 5 and 6); Tables 7-9 present employment and other variables such as gross fixed capital formation associated with tourism.
Similarly, the purpose of the TSA is to provide measurements of each of the variables it contains. It is clear that this objective is difficult to achieve: at most an attempt is made to determine the values of the key variables that characterise the tourism industries:
- domestic consumption by type of tourism;
- the value added of the tourism industry;
- the value added of tourism;
- the trading margins;
- the taxes and VAT on products purchased;
- the GDP from tourism;
- the jobs created by tourism;
- tourism gross fixed capital formation.

Table 1: List of tables making up a TSA

Name	Object
Table 1	Inbound tourism expenditure; an element of aggregate demand
Table 2	Domestic tourism expenditure; part of total consumption Dépenses du tourisme récepteur, interne et émetteur
Table 3	Outbound tourism expenditure
Table 4	Internal tourism final consumption (Consommation du tourisme intérieur)
Table 5	Production accounts of tourism industries and other industries (Comptes de production des industries touristiques et d'autres industries)
Table 6	Domestic supply and internal consumption by products Offre interne totale et Consommation du tourisme intérieur
Table 7	Employment in tourism industries Emploi dans les industries touristiques
Table 8	Tourism gross fixed capital formation Investissements
Table 9	Tourism collection consumption by functions and levels of government (consommation des pouvoirs publics)
Table 10	Non monetary indicators of tourism Indicateurs non monétaires

Source: UNWT

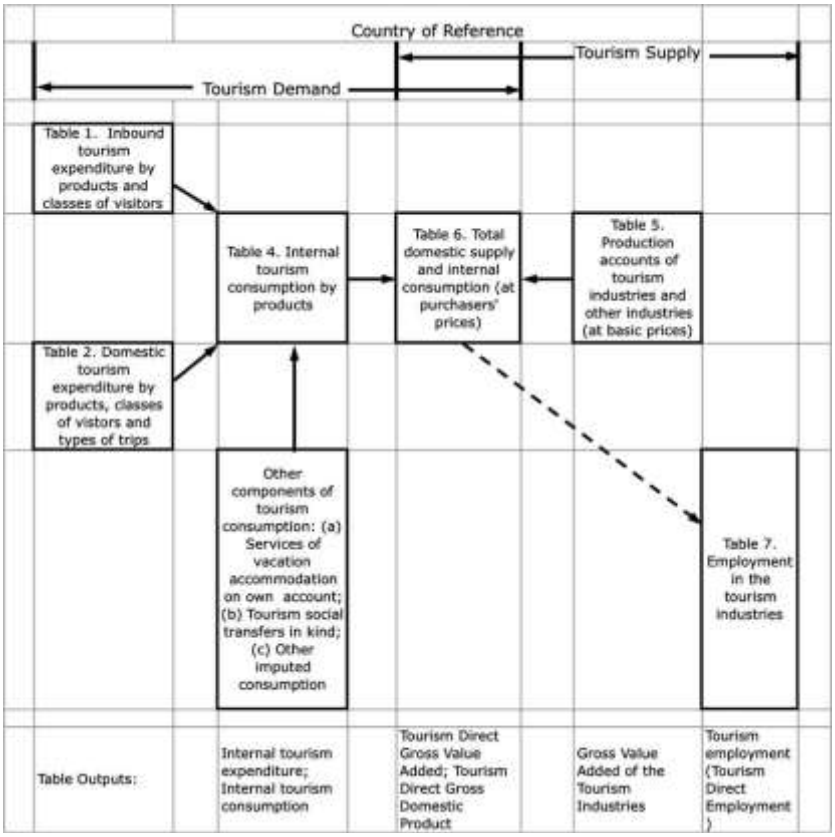

Figure 4: Tourism Satellite Account Tables Required for Estimating Macroeconomic Aggregates
Sources: Frechtling (2009).

3 SAM modelling: an approach for drawing up the Tourism Satellite Accounts

At present Guadeloupe has no TSA-type tool for the accounting evaluation of its tourism activity. It is with the aim of remedying this situation that we propose the application of SAM here as an instrument for the development of the main tables forming a system of simplified tourism satellite accounts. With their logic of refining the representation of the economic circuit, these SAM models allow a more extensive examination of the issues than is possible with standard IO models.

The construction of TSA using simple input-output models (IOT) has been carried out by a few institutes such as the World Travel and Tourism Council (WTTC), the US Travel Association and Wharton Econometric Forecast Associates (WEFA) for a number of countries. It has also formed the subject of research within national statistical institutes such as the Swiss Federal Statistical Office and Statistics Canada. In the French Overseas Departments, it has been conducted by

the INSEE statistical office of Réunion and by the ARDTM-CEREGMIA-INSEE for the TSAs of Martinique.

With regard to the deployment of the SAM, the extent of its use in developing TSAs is much more blurred. Indeed, the literature is filled with a plethora of studies devoted to evaluating the impact of tourism through the use in input-output techniques, yet few of them go beyond the TSA framework to apply SAM as a multiplier calculation tool. This exercise was carried out by Polo and Valle (2009) who quantified the various types of tourism impact in the case of the Balearic Islands. This contribution targets the same objective for Guadeloupe; however, our approach to the use of SAM is more innovative in that it involves constructing accounting data in addition to an impact study.

The SAM used here constitutes an extension of that constructed on the basis of 2005 data and which takes into consideration sixteen products, sixteen sectors, two production factors and four agents, namely households, undertakings, administrations and the rest of the world (see Mathouraparsad, Maurin and Montauban (2004 and 2006) and Mathouraparsad (2011)). More specifically, it centres on double-entry accounts for 24 products, 24 branches of activity, 4 production factors (land, physical capital, skilled labour and unskilled labour), 7 agents (households, the State, local authorities, tourists, the rest of the world, individual undertakings and other undertakings) and several transfer accounts (taxes, subsidies, transactions costs and other transfers between agents) and one accumulation account (which distinguishes between private investment, public investment and stock variations).

3.1 The contribution of the SAM to the construction of Tourism Satellite Accounts

In their report on the recommendations for the conceptual framework for Tourism Satellite Accounts, the European Commission-United Nations-OECD-WTO (2000) specify a few methodological points in this regard:

"From tourism shares established for output, it is possible, through different calculations involving assumptions concerning the technologies applied to the production processes of the establishments, to estimate for each activity a tourism share to be applied to the components of intermediate consumption

From the difference between the values of output attributable to visitor consumption and to intermediate consumption, the value added generated by visitor consumption can be computed. These calculations usually suppose the use of input-output techniques and of the processes of reduction from a rectangular input-output table to a square commodity-by-commodity/product-by-product input-output table.

Since a value added can be associated to the value of part of the output of a productive unit, tourism value added can be defined as the value added generated by tourism industries and other industries of the economy in response to internal tourism consumption. To obtain the GDP generated by internal tourism consumption, to tourism value added should be added the taxes net of subsidies on products and imports related to the tourism sector, a figure that corresponds exactly to the difference between this variable valued at purchasers' prices and at basic prices, since distribution margins have already been taken into consideration.

With regard to the economic weight of the tourism sector, this must be valued as the ratio between the tourism value added and GDP rather than according to the current French practice (ratio between internal tourism consumption and GDP)."

To our knowledge, the first attempt to draw up a TSA for an overseas department or territory should be attributed to Carpin, Logossah, Marquès and Para (2004) for Martinique. They were constructed from an approach based on the IIT (intermediate inputs table) drawn up by the INSEE and on trickle-down effect indicators developed by the authors. More specifically, they estimated tourism consumption and tourism production, the tourism branch account, the trickle-down effects of the sector, the tourism public account, tourism employment and external accounts. They used the supply and use tables of the Regional Accounts, the branch-product production structure of the IIT.

In developing TSAs for Martinique, the CEROM (Early Economic Accounts for Overseas France) (2009) followed the recommendations of the WTO. Given the lack of data on domestic tourism consumption, they favoured a supply-based approach and moved from tourism supply to tourism demand through the use of touristicity rates for each activity.

Alongside local actors, the WTTC was also involved in the conduct of studies to quantity the economic benefits of tourism in the French West Indies An influential actor in the international community of tourism professionals - one of its *raisons d'être* being to document the economic importance of the travel and tourism sector in various destinations across the world - the WTTC is also known for its annual tourism diagnostics for a group of 184 countries and territories, including the thirty or so Caribbean islands.

Faced with the obstacle of the lengthy and onerous task of constructing complete satellite accounts, this council devised its own methodology while at the same time reconciling the recommendations of the WTO with timely publications for political decision-makers and investors.
In practice, this is a demand-based approach that relies on two key phases. Firstly, estimation of the economic impacts of visitor consumption (travel and tourism industry) and total demand (travel and tourism economy). Secondly, the use of

input-output tables to reconcile expenditure aggregates (demand) with resource aggregates (supply) and also to break down GDP and total employment into direct and indirect components.

For its Travel & Tourism Competitiveness Index 2015 Ranking, the WTTC experts have established a diagnostic of each destination on the basis of an array of 14 indicators, placing emphasis on the various aspects of tourism performance and the employment environment for the sector's undertakings. The report on Guadeloupe (WTTC 2015) reveals that the travel and tourism sector shows moderate performances and that the archipelago is frequently ranked well below its Caribbean neighbours.

Since the audit and forecasting tasks of the WTTC are widely recognised internationally, it is of course necessary to consider them from the comparative viewpoint of their methodological robustness. As stressed by a number of authors (including McHale (2007), Frechtling (2009, a)) it is important to note that the WTTC approach differs fundamentally from the methodology recommended by the WTO. The WTO methodology culminates in a TSA that is based on the existing system of national accounts whereas the former forecasts the economic contribution of the tourism sector on the basis of estimated relationships between diverse supply and demand variables within the economy. Similarly, although the WTTC approach provides a means of constructing forecasts for the panel of 184 territories covered at present, for each individual country it is not necessarily based on tested relationships between the economic variables and reliable data.

Behind these divergences, there are strong controversies over the significant challenges presented by measurement of the weight of tourism. The single example of calculating the competitiveness of destinations - necessary for investors in their analyses of the competitive positioning of countries - amply suffices to illustrate the extent to which data collection and tourism activity measurement mechanisms need to be developed and applied in a rigorous and consistent manner. It is this problem to which Frechtling (2009, a) refers in his argument in support of TSAs:
"The TSA brand is unfortunately threatened with distortion and misuse. The TSA is distorted when researchers describe the structure and results of the TSA in distorting terms which raise false expectations in potential users and weaken the TSA brand. The TSA brand is misused when reports are published based on methodologies that claim to 'simulate' TSAs for countries and sub-national territories. Such reports, which tend to exaggerate the direct contribution of tourism to economies, can cause conflicts between national tourism administrations and national statistics institutes."

After this overview of the literature applied in the French Overseas Departments, we can settle upon the essential contribution of this article.
The methodology we propose also follows the OECD recommendations. However, it departs from those used in the case of Martinique and Réunion on two points.
Firstly, in addition to the economic elements of the TSAs we propose social data from the TEE, in this instance transfers between agents which constitute the agents' revenues. The accounts of institutional sectors provide a means of tracing the revenues and expenditure of each institutional agent. Without doubt, this additional input has the advantage of incorporating impacts in terms of revenues received by all workers (not only those in the tourism branch), undertakings and administrations. In fact, a revenue surplus (unemployment benefit, return on capital or salaries etc.) changes the behaviour of households (consumption) and in turn impacts other branches of activity. Furthermore, a change in the revenues of households or undertakings also affects the account of the administration which collect taxes on incomes and profits.
Secondly, although the CEROM favoured a supply-based approach, we felt it important to understand the interactions relating to the indirect and induced effects of tourism by favouring a demand-based approach, in other words, starting from the expenditure vector identified in the economic accounts. In particular, it enables us to simulate what is generated by visitor expenditure in the SAM within the various accounts (supply and use, branch accounts, IIT etc.).

In turn, our investigations focused on:

- An evaluation of supply and use: the estimation of tourism production on the basis of tourism consumption, performed via the supply and use table of the Regional Account; it is then possible to evaluate the imports, exports, intermediate consumptions, taxes etc. relating to tourist expenditure.
- An evaluation of the tourism production branch account on the basis of the structure of the productions of the branches-products for the IIT and branch accounts.
- A breakdown of the trickle-down effect of the tourism branch: calculation of the direct, indirect and induced effect in terms of value added, salaries, external accounts etc.

3.2 The method: a simulation-based approach

The SAM is particularly appropriate for estimating the effects of exogenous changes or injections such as an increase in public expenditure or exports. Any demand shock can be followed by an increase in production which occurs due to the system of interdependence between the economic aggregates. The direct, indirect and induced effects of an injection to the endogenous accounts are evaluated using multipliers. For example, a public works programme for the

construction of a road would require a certain number of workers provided by household categories in rural and urban areas. In turn, the revenues received by these two categories of workers will be used on the consumption of goods. The increased production of goods to satisfy the demand surplus will lead to the creation of more jobs and revenues in these same groups of households. This mechanism will continue until such time as the multiplicative process is no longer in play.

The SAM consists of endogenous and exogenous accounts. Endogenous accounts are those that vary with revenue. They include production activities (the intermediate inputs sub-matrix), production factors and the institutions (comprising households and undertakings). Exogenous accounts are those for which expenditure is independent of any variation in revenue. They include the government, the capital account, tourists and the rest of the world. Table 6 gives a schematic representation of the configuration of the SAM, in which endogenous and exogenous accounts are highlighted.
Total receipts of endogenous accounts read along the row are given by $\mathbf{y_n}$ which is equal to the sum of the expenditure of the endogenous accounts (T_{nn}), equivalent to **n**, plus the sum of the expenditure of the exogenous accounts (T_{nx}), equivalent to **x** and which represents the injections. Finally, one obtains $\mathbf{y_n = n+x}$ and likewise, for the exogenous accounts, one obtains $\mathbf{y_x = l+t}$. In addition, as the rows and columns have to be balanced, one obtains $\mathbf{y_n = y_n'}$ and $\mathbf{y_x = y_x'}$ where $\mathbf{y_n'}$ and $\mathbf{y_x'}$ are the transposes of columns $\mathbf{y_n}$ and $\mathbf{y_x}$. All of T_{xn} represents leakages and all of T_{xx} the residual balances.

A focus on the interrelationships block (matrix T_{nn}) between the endogenous accounts serves to highlight the various sub-tables to be noted, respectively, $T_{13,}$ $T_{21,}$ $T_{22,}$ T_{32} and $T_{33.}$ $\mathbf{T_{33}}$ represents the needs for intermediate inputs, $\mathbf{T_{32}}$ indicates the amount of expenditure outlaid by the institutions for the various goods they consume, $\mathbf{T_{13}}$ breaks down the value added generated by the various sectors between the production factors while $\mathbf{T_{21}}$ describes the distribution of revenues between the institutions. $\mathbf{T_{22}}$ represents the transfers between the institutions.

Table 2: Simplified representation of an SAM

		Expenditure				TOTAL
		Endogenous accounts	sub-total	**Exogenous accounts**	sub-total	
Receipts	**Endogenous accounts**	T_{nn}	n	T_{nx}	x	y_n
	Exogenous accounts	T_{xn}	l	T_{xx}	t	y_x
TOTAL				y_x'		

Defourny and Thorbecke (1984)

We have opted for a disaggregation level and an endogenous account structure that distinguish:

- 24 products and 24 branches
- 4 production factors (capital, land, skilled labour and unskilled labour) and excess earnings
- households
- undertakings (micro-undertakings and others)

Revenues are distributed between the productive activities, the factors and the institutions. Thus, the value added is paid by the productive activities to the production factors. This then determines the revenues of the households, undertakings and the State and therefore their level of consumption.

The existing interrelationships provide a means of measuring any impact on the socio-economic system caused by an injection. The magnitude of the impacts that occur is measured by means of multipliers which depend on the intensity of the links between the sectors.

It is possible to break down the multiplier so as to identify the effects exerted on the system. An analysis of the breakdown then provides decision-makers with valuable insights relating to the various impacts on the endogenous accounts.

The method of obtaining the multiplier breakdown was introduced by Pyatt and Round (1979), modified by Stone (1985) and then widely covered in the literature. We therefore present a brief description of it. Pyatt and Round (1979) start from the equilibrium $\mathbf{y_n = n + x}$.

$$\mathbf{y}_n = \mathbf{A}_n \mathbf{y}_n + x = \left(\mathbf{I} - \mathbf{A}_n\right)^{-1} x = \mathbf{M}_a \mathbf{x} \qquad (1)$$

where $\mathbf{A}_n$ is the matrix of standard endogenous coefficients, also called the matrix of average expenditure propensities, and $\mathbf{M}_a$ the matrix of multipliers. The revenues of the endogenous accounts can be determined by premultiplying the injections x_n by the multiplier M_a. This matrix therefore offers a means of calculating the totals obtained in the columns in the SAM, but not how they are generated.

Several examples serve to illustrate the information contained in this matrix A_n. For example, one can decipher that the production of a unit of agricultural products generates 70% in capital revenues and 30% of labour revenues. Similarly, by reading the elements in the households column, it is possible to determine their consumption goods basket, the amount of taxes they pay to the State and the amount they save. Many specific cases also serve to illustrate how the multiplier $\mathbf{M}_a$ can be interpreted. If one looks, for example, at the impact of a 100-unit reduction in exports of agricultural products on the socio-economic system as a whole, one would see that it would lead to a reduction of 56 units of capital revenues and 44 units of salaries.

The multiplier can be broken down into three multiplicative components, as shown below:

$$\mathbf{y}_n = \mathbf{M}_a\mathbf{x} = \mathbf{M}_{a3}\mathbf{M}_{a2}\mathbf{M}_{a1}\mathbf{x} \tag{2}$$

Stone (1985) demonstrated that this breakdown can be expressed as follows:
To summarise, the three breakdown levels reflect the various sequences of a complete cycle. The elements of the matrix M_{a1} capture the intra-group effects of the exogenous injections. Within it, one can distinguish the inter-industrial operator multiplier effects and the inter-institutional transfers. The matrix M_{a2} describes the open-loop effects that are propagated throughout the exogenous accounts thereby forming a loop. Finally M_{a3} introduces the closed-loop effects. The flows are propagated throughout the system, thus making successive rounds until the effects are absorbed, bringing the process to an end.

$$\begin{aligned}\mathbf{M}_a &= \mathbf{I} + (\mathbf{M}_{a1} - \mathbf{I}) + (\mathbf{M}_{a2} - \mathbf{I})\mathbf{M}_{a1} + (\mathbf{M}_{a3} - \mathbf{I})\mathbf{M}_{a2}\mathbf{M}_{a1} \\ &= \mathbf{I} + \quad \mathbf{T} \quad + \quad \mathbf{O} \quad + \quad \mathbf{C}\end{aligned} \tag{3}$$

These three types of multiplier are primarily used for general analyses of the effects of shocks on the various sectors of an economy. Each one has a specific interpretation (other than the identity matrix **I** which captures the initial injection):

- The direct effects multiplier (transfer effects) **T** captures the direct effects between the groups of endogenous accounts (intra-group transfers). This matrix estimates the impacts within the account that is first affected. For example, the

direct effect of a tourist purchasing a hotel room will concern the hotels-restaurants branch and will correspond to the price paid for the room.

- The open-loop multiplier **O** captures the interactions between endogenous accounts (extra-group or indirect effects). This matrix estimates the impacts of an injection on the other accounts, without feedback effects to the original account. For example, the extra-group effect of a tourist purchasing a hotel room will be the change in household revenues (production factors account) and their consumption (institutional account). These multipliers show how the impacts are transmitted to the other categories of account.
- The closed-loop multipliers C show the complete circular effect of the shock (induced effects). They have inter-group effects and explain how the shock on one sector affects other sectors before coming back to its starting point. For example, the purchase of a room by a tourist, in the form of a production of services, would have impacts on household revenues leading simultaneously to an increase in purchases of goods and services by those households, which also include the hotels branch, hence a consumption of this service.

Following a shock, it is possible to break down the effects by applying this method. A simulation consists in making a change to one of the exogenous accounts appearing in Table 2. We then obtain a new SAM.

4 Applications to the evaluation of the weight of tourism in Guadeloupe: towards satellite accounts

4.1 Tourist expenditure and tourism production

Tourists spent €289 million in the year 2005. Their main expenditure items were hotel accommodation and meals, to which they dedicated 61% of total expenditure. Next comes expenditure on vehicle hire, purchases of consumption goods etc.

Tourism represents 3.7% of regional GDP. Tourists consume 8.6% of the production of local alcoholic beverages and 4.9% of services to individuals. They account for 26% of the turnover realised by the hotels and restaurants branch.
The tourist expenditure that can be interpreted as an export represents 56% of all exports and covers 10% of imports.
The production generated by tourism expenditure stands at €580 million and €98 million in imports.

The SAM offers a ready means of determining the key aggregates revealing the amounts generated by tourism.

Table 3: Amounts of some aggregates generated by tourism (millions of Euros)

Production	580
Exports	289
Imports	98
Trade deficit	190
VAT and other taxes on products	39
Direct taxes	34

Imports connected with the sector are €98 million, corresponding to 4% of total imports, and generates 5% of indirect tax receipts on products. Furthermore, it generates almost 3.7% of salaries and 4% of profits. It generates almost 2% of taxes in income and 1.7% of corporate taxes.

4.2 The tourism branch account

The tourism activity branch is determined from several other branches of activity. As is the case for the accounts of other branches, that of tourism provides a means of evaluating the usual aggregates: production, value added, gross operating surplus (GOS) and the revenues distributed by this activity.
In 2005, the tourism branch provided an overall value added of €276 million. The resultant Gross Operating Surplus (GOS) amounted to 27% of the Value Added.
The gross salaries distributed amounted to €119 million, corresponding to 7% of the salaries distributed by the market branches.

Table 4: Branch account (millions of Euros)

Production	580
Intermediate consumptions	304
Value added	276
Taxes on production	14
Compensation of employees	119
Social security contributions	28
Gross operating surplus and "excess profits"	74
Production subsidies	-5

One indicator for measuring the dependence of the economy vis-à-vis the tourism sector is the touristicity coefficient[2]. The higher the coefficient, the more

[2]According to the INSEE definition, it "relates the amount of intermediate consumptions of a branch to the total amount of intermediate consumptions realised in tourism. With this in mind, a sector will be all the more touristic in view of the fact that its purchases are made to realise touristic production".

dependent the branch will be deemed and therefore the more it will be deemed to be characteristic of tourism.

Overall, the touristicity coefficient of the Guadeloupe economy stands at 6%. The highest coefficient is seen in the hotels-restaurants branch (29%), followed by the services to undertakings branch (20%), the trade branch (12%) and the energy and transport branches (7%). These are branches with a relatively high potential for development through tourism.

Table 5: Touristicity of branches in terms of production

	Production (millions of Euros)	**Percentage of production**
Banana cultivation	1	0%
Sugar cane	7	1%
Other agriculture	5	1%
Fishing	4	1%
Rum	11	2%
Meats and milk	2	0%
Other agriculture and food processing industries	13	2%
Consumer goods industry	4	1%
Capital goods industry	10	2%
Mineral products industry	3	0%
Other intermediate goods industries	7	1%
Fuel	0	0%
Electricity	41	7%
Construction	3	1%
Trade	68	12%
Transport	38	7%
Financial activities	14	2%
Real estate activities	23	4%
Telecommunications	11	2%
Other services to undertakings	116	20%
Hotels and restaurants	167	29%
Other services to individuals	23	4%
Education, health	5	1%
Administrations	3	1%

In 2005, the value added of the tourism branch represented 5% of the value added of the market branches. The direct weight of tourism is thus 10% of the market gross value added. Of the 23 market branches with highest value added in the total

gross value added, the branch is ranked 7th. In terms of importance, the total payroll stands in 5th place.

Table 6: Classification by size of value added

	Market branches percentage	**Classification**
Trade	18	1
Real estate activities	16	2
Services to undertakings	13	3
Construction	12	4
Electricity	7	5
Financial activities	7	6
Tourism	5	7
Hotels-restaurants	5	8
Transport	5	9

Table 7: Classification by size of wage bill

	Market branches percentage	**Classification**
Trade	26	1
Services to undertakings	15	2
Construction	12	3
Hotels-restaurants	8	4
Tourism	7	5
Financial activities	6	6
Transport	6	9

The product item most intensively consumed by the tourism branch is "other services to undertakings". By contrast, the products least intensively consumed are non-market services and agricultural goods.

In terms of total weight, the "tourism sector" represents 6% of market production, corresponding to €580 million. It is thus ranked 9th of the 24 branches classified according to the size of their production.

Table 8: Intermediate products consumed (millions of Euros)

	Value of inputs consumed
Banana cultivation	0
Sugar cane	4
Other agriculture	4
Fishing	3
Rum	5
Meats and milk	10
Other agriculture and food processing industries	35
Consumer goods industry	16
Capital goods industry	26
Mineral products industry	5
Other intermediate goods industries	25
Fuel	23
Electricity	20
Construction	2
Trade	9
Transport	24
Financial activities	6
Real estate activities	10
Telecommunications	10
Other services to undertakings	60
Hotels and restaurants	3
Other services to individuals	3
Education, health	2
Administrations	-
Total	**304**

4.3 The trickle-down effects of tourism

The methodology used enables us to distinguish a number of types of effect. To evaluate the direct effect, the traditional inputs-outputs model is used. It is based solely on the transactions of the inter-industrial operator matrix or the activities sub-account of the matrix. According to our results, tourism directly generated a production of €446 million, corresponding to 4% of overall market production.

Next, the indirect effects consist only of the additional economic impacts engendered by the wages and salaries received by households by way of compensation for the labour factor (Miller and Blair, 1985). The sector thus generates €143 million in household revenues, corresponding to 2% of total household revenues.

Finally, the expenditure of the activity account will also have an impact on the other accounts. The induced effects evaluate the influence of the salaries that are generated by tourism consumption and distributed to the rest of the economy. The Stone (1985) and Bulmer-Thomas (1982) method calculates the induced effects and defines a multiplier that closes the inter-industrial operator transactions of the SAM in response to the expenditure produced by the returns on labour and capital received by households. In terms of induced effects, tourism thus appears to be a source of wealth creation to the tune of €134 million, corresponding to 1.4% of overall market production.

Consequently, analysis of the impact of tourism on the other branches enables us to identify a variety of benefits.

Table 9: Breakdown of the effects on a selection of aggregates (thousands of Euros)

	Value added	Tax receipts
Direct	148	989
Indirect	42	759
Induced	86	822
Total	276	2,570

An undoubted advantage of this SAM-based approach is that it offers a very clear estimate of the trickle-down capacity of the tourism branch. By analysing the implications of international tourism for other branches of the economy, it is in fact possible to determine the productions arising from direct, indirect and induced effects for the 25 branches of the economy. These have been set forth in the table below:

The direct effect is by far the most significant, accounting for 77% of the overall trickle-down effect.
The branches benefiting most from the induced trickle-down effects of tourism are trade (€30 million and 22% of the overall trickle-down effect), real estate activities (€16 million and 12% of the overall trickle-down effect) and other services to undertakings (€15 million and 11% of the overall trickle-down effect).

Analysis of the tourism multiplier effect, which relates cumulative effects to direct effects, shows that a direct production estimated at 100 generated by expenditure outlaid by tourists leads to an overall production amount of 130 as the result of indirect and induced effects.

Table 10: Trickle-down effects of tourism by branch (thousands of Euros)

	Direct	Indirect	Induced	Total
Banana cultivation	0	-	0	1
Sugar cane	6	-	0	7
Other agriculture	2	-	3	5
Fishing	2	-	1	4
Rum	10	-	1	11
Meats and milk	1	-	1	2
Other agriculture and food processing industries	10	-	3	13
Consumer goods industry	2	-	3	4
Capital goods industry	8	-	2	10
Mineral products industry	2	-	1	3
Other intermediate goods industries	5	-	3	7
Fuel	0	-	0	0
Electricity	32	-	9	41
Construction	2	-	2	3
Trade	38	-	30	68
Transport	27	-	11	38
Financial activities	4	-	10	14
Real estate activities	7	-	16	23
Telecommunications	7	-	4	11
Other services to undertakings	101	-	15	116
Hotels and restaurants	159	-	8	167
Other services to individuals	18	-	5	23
Education, health	1	-	3	5
Administrations	-	-	3	3
Households	-	109	34	143
Undertakings	-	20	8	29
Micro-undertakings	-	13	5	18

Table 11. Multiplier effect

	Direct effect	**Indirect and induced effect**	**multiplier**	**Overall effect**
Production	446	144	1.30	580

5 Simulation of a rise: return to the record level of 2000

Adopting the same methodology as that used to construct the TSAs for Guadeloupe, we perform a simulation of a rise of approximately 14% in tourist expenditure, equalling their record level of €328 million in the year 2000. All other things being equal, such an increase in tourist expenditure would lead to a +0.46% change in GDP, with an increase in production of 0.55%.
As shown in the table below, practically all market activities would be affected by this rise, with the exception of non-market services which change very little. The most affected is the hotels-restaurants branch, with a 3.6% change, and the sugar and rum branch with an increase in activity in the order of 1.8%.

Table 12. Effects of a 14% rise in tourist expenditure on the value added of the branches

Banana cultivation	0.2%
Sugar cane	1.8%
Other agriculture	0.3%
Fishing	0.7%
Rum	1.8%
Meats and milk	0.7%
Other agriculture and food processing industries	1.0%
Consumer goods industry	0.3%
Capital goods industry	0.6%
Mineral products industry	0.2%
Other intermediate goods industries	0.3%
Fuel	0.5%
Electricity	0.8%
Construction	0.0%
Trade	0.4%
Transport	0.7%
Financial activities	0.3%
Real estate activities	0.3%
Telecommunications	0.5%
Other services to undertakings	1.2%
Hotels and restaurants	3.6%
Other services to individuals	0.9%
Education, health	0.0%
Administrations	0.0%

The revenues of agents would be positively affected by this rise. The compensations for households and undertakings would increase by 0.2% and 0.3% respectively. This rise would logically be followed by an increase in household consumption estimated at 0.25% but also by a small 0.07% reduction in imports as a response to the boom in economic activity.
As the result of the rise in household revenues, tax receipts would increase. The rises in income and corporate tax receipts would be approximately 0.25% and 0.21%. The amount of receipts from indirect taxes on products would also rise, by 0.46%.

The total effect of the multiplier identifies the branches most closely correlated to the tourism sector. Thus, the sugar-rum branch sees its activity increase by almost 1.8%. This is primarily due to the souvenirs taken home by tourists when they leave the island.

By breaking down total revenues, one can see that for the sugar-rum branch the direct multiplier generates €1.4 million of production, out of the total of €1.5 million.
The hotels-restaurants branch is likely to produce an additional €21.4 million through the direct effects, and €1 million through the induced effects.
Out of a total additional €17.6 million, households would receive €13.5 million indirectly and €4.1 million incidentally.

Table 13: Breakdown of the multiplier effects following a 14% injection of tourist expenditure (in millions of Euros)

		DIRECTS	INDIRECTS	INDUCED	TOTAL	Variation following a shock
Production factors	Capital factor	0.0	6.6	2.6	9.2	0.5%
	Land factor	0.0	0.4	0.1	0.5	0.8%
	Excess profits	0.0	0.1	0.1	0.2	0.5%
	Skilled labour factor	0.0	4.0	1.6	5.6	0.3%
	Unskilled labour factor	0.0	6.9	1.6	8.5	0.7%
Products	Banana cultivation	0.0	0.0	0.0	0.1	0.2%
	Sugar cane	0.5	0.0	0.0	0.5	1.8%
	Other agriculture	0.4	0.0	0.6	0.9	0.3%
	Fishing	0.4	0.0	0.2	0.6	0.7%
	Rum	1.8	0.0	0.1	1.9	1.8%
	Meats and milk	1.3	0.0	0.6	1.9	0.7%
	Other agriculture and food processing industries	5.2	0.0	1.3	6.5	1.0%
	Consumer goods industry	1.5	0.0	2.2	3.7	0.3%
	Capital goods industry	-22.5	0.0	1.5	-21.0	-1.6%
	Mineral products industry	0.3	0.0	0.2	0.5	0.2%
	Other intermediate goods industries	0.8	0.0	1.3	2.1	0.3%
	Fuel	2.2	0.0	1.5	3.7	0.5%
	Electricity	2.3	0.0	0.6	2.9	0.8%
	Construction	0.2	0.0	0.2	0.4	0.0%
	Trade	0.7	0.0	0.6	1.3	0.4%
	Transport	4.2	0.0	1.6	5.8	0.6%
	Financial activities	0.6	0.0	1.2	1.8	0.3%
	Real estate activities	1.0	0.0	1.9	2.9	0.3%
	Telecommunications	1.0	0.0	0.5	1.5	0.5%
	Other services to undertakings	13.8	0.0	1.9	15.8	1.2%
	Hotels and restaurants	22.2	0.0	1.0	23.2	3.5%
	Other services to individuals	2.5	0.0	0.7	3.3	0.9%
	Education, health	0.2	0.0	0.4	0.6	0.0%
	Administrations	0.0	0.0	0.4	0.4	0.0%
Branches of activity	Banana cultivation	0.1	0.0	0.0	0.1	0.2%
	Sugar cane	0.9	0.0	0.0	0.9	1.8%
	Other agriculture	0.2	0.0	0.4	0.6	0.3%
	Fishing	0.3	0.0	0.2	0.5	0.7%
	Rum	1.4	0.0	0.1	1.5	1.8%

	Meats and milk	0.2	0.0	0.1	0.3	0.7%
	Other agriculture and food processing industries	1.4	0.0	0.3	1.7	1.0%
	Consumer goods industry	0.2	0.0	0.3	0.5	0.3%
	Capital goods industry	-4.2	0.0	0.3	-3.9	-1.6%
	Mineral products industry	0.2	0.0	0.1	0.3	0.2%
	Other intermediate goods industries	0.2	0.0	0.3	0.6	0.3%
	Fuel	0.0	0.0	0.0	0.0	0.5%
	Electricity	4.2	0.0	1.2	5.3	0.8%
	Construction	0.2	0.0	0.2	0.4	0.0%
	Trade	4.6	0.0	3.7	8.3	0.4%
	Transport	3.6	0.0	1.4	5.0	0.6%
	Financial activities	0.5	0.0	1.2	1.7	0.3%
	Real estate activities	1.0	0.0	1.9	2.9	0.3%
	Telecommunications	1.0	0.0	0.5	1.4	0.5%
	Other services to undertakings	13.3	0.0	1.9	15.1	1.2%
	Hotels and restaurants	21.4	0.0	1.0	22.4	3.5%
	Other services to individuals	2.4	0.0	0.6	3.0	0.9%
	Education, health	0.2	0.0	0.4	0.6	0.0%
	Administrations	0.0	0.0	0.4	0.4	0.0%
	Households	0.0	13.5	4.1	17.6	0.2%
	Undertakings	0.0	2.6	1.0	3.6	0.2%
Agents	Micro-undertakings	0.0	1.6	0.6	2.3	0.5%

The branch that responds most rapidly is the financial activities branch. The direct production of the agriculture and food processing industries generated by an estimated increase in tourist expenditure of 100 Euros leads to an overall rise in production of 315 Euros as a result of the indirect and induced effects.

Table 14: Effects of a 14% rise in tourist expenditure

	Multipliers
Banana cultivation	1.4
Sugar cane	1.1
Other agriculture	2.5
Fishing	1.5
Rum	1.1
Meats and milk	1.5
Other agriculture and food processing industries	1.3
Consumer goods industry	2.5
Capital goods industry	0.9

Mineral products industry	1.6
Other intermediate goods industries	2.6
Fuel	1.7
Electricity	1.3
Construction	2.1
Trade	1.8
Transport	1.4
Financial activities	3.2
Real estate activities	3.0
Telecommunications	1.5
Other services to undertakings	1.1
Hotels and restaurants	1.0
Other services to individuals	1.3
Education, health	3.1
Administrations	0.0

6 Conclusion

In direct connection with its professional sectors of hotels, restaurants, travel agents, car hire, historical monument sites, theme parks, etc. and in indirect connection with the branches of activity of other sectors, the tourism industry stands out for its considerable economic and social value in the majority of industrialised countries, and is also a powerful source of revenue and employment in many countries across the world.

Now much more than ever before, tourism in Guadeloupe cannot be immune to this reality. Its trajectory over the last four decades clearly demonstrates that the archipelago has moved from the position as a winning destination up to the turn of the millennium to its present situation as a destination in crisis, posting a notable decline in visitor numbers and adversely affected by deterioration in its hotel offer. More acutely than the majority of its Caribbean neighbours, today the Guadeloupe economy stands at a crossroads and, in terms of sectors in particular, its tourism industry is in need of a fresh impetus.

Inescapably, the challenge of restoring its glorious past performances, and especially achieving wider growth in the coming years, calls for the optimisation of the economic impact of tourism on the Guadeloupe economy. A great deal of work needs to be done if this is to be achieved. The tasks of statistical observation and macroeconomic modelling are paramount and, more specifically, paraphrasing Vellas (2011), the decision-making actors of Guadeloupe must create the "possibility of promoting a significant exploitation of tourism as a job-creating

economic development factor by implementing specific actions designed to draw up economic evaluations of the direct and indirect effects of tourism based on new statistical tools consisting of a set of headings which, when grouped together, can better inform public policies with regard to the economic, social, direct and indirect effects of the tourism activity."

The discussions and empirical investigations presented in this article are intended to achieve these objectives. First, we have summarised the essential concepts and definitions relating to the macroeconomic impact of tourism; then we have offered a brief summary of the corpus of literature dedicated to evaluating the weight of the tourism industry in the economies of the French Overseas Departments, in particular in the case of Guadeloupe. Secondly, we have demonstrated that the theoretical framework of SAM modelling provides a particularly appropriate approach to conducting a detailed analysis of the repercussions of tourism in terms of its direct, indirect and induced effects across the various branches of the economy. Since Guadeloupe does not at present have an official system of Tourism Satellite Accounts, we propose to adopt the SAM as an alternative approach in order to establish results capable of filling this information deficit. Alongside the TSA-type macroeconomic analyses of tourism activities performed for Réunion and Martinique, the studies described in this contribution now offer clarification of a similar nature on the measurement of the impact of tourism on the Guadeloupe economy.

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APENDIX

Table 1: Characteristic products and activities of tourism

List of characteristic products of tourism	**List of characteristic activities of tourism**
Description of the products	**Description of the activities**
1. Accommodation services	1. Hotels and related establishments
1.1 Hotels and other accommodation services	2. Ownership of second homes (imputed)
1.2 Tourist accommodation services on own account or free of charge	
2. Restaurant services	3. Restaurants and related establishment
3. Passenger transport services	
3.1 Inter-urban rail passenger transport services	4. Rail passenger transport
3.2 Road passenger transport services	
3.3 Waterway passenger transport services	5. Road passenger transport
3.4 Air passenger transport services	6. Waterway passenger transport
3.5 Ancillary passenger transport services	7. Air passenger transport
3.6 Hire of passenger transport equipment	8. Ancillary passenger transport services
3.7 Passenger aircraft and vessel maintenance and repair services	
4. Services of travel agencies, tour operators and tourist guides	9. Hire of passenger transport equipment
4.1 Travel agency services	
4.2 Tour operator services	10. Travel agencies and related activities
4.3 Tourist information and tourist guide services	
5. Cultural services	11. Cultural services
5.1 Dramatic arts	
5.2 Museum and other cultural services	12. Sport and other recreational services
6. Leisure and entertainment services	
6.1 Sport and recreational sport services	
6.2 Other leisure and entertainment services	
7. Miscellaneous tourism services	
7.1 Financial and insurance services	
7.2 Other goods hire services	
7.3 Other tourism services	

Source: OMT (2001)