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Causes of incorrect use of financial statements. Deficiency in their teaching-learning

HERRERA-CHAIRES, María †, GAMBOA-CERDA, Silvia and MEDELLÍN-RAMÍREZ, J.

Universidad Autónoma de San Luis Potosí

Abstract

Profesionista accounting activity is necessary to take decisions that will affect the operating and financial future of an economic entity. To this end, it has several tools to make an assertive choice; one of these financial statements are, unfortunately, not all accounting professionals and know how to use properly, bringing consequently making bad decisions. There are three main reasons detected poor and misuse of the financial statements of academic, bibliographical nature and legislation. This paper proposes premised identify reasons why accounting professionals do not use properly the financial statements by establishing the implementation of a correct methodology in the training of professional accounting, based on interviews conducted students of the degree in Accounting and and finance professionals to corroborate the information obtained in diagnostic tools in an effort to obtain a broader picture of the current situation that observes the accounting profession in professional performance and new graduates in the use of financial statements. To feed back to the academy in rethinking teaching and learning processes in the use of financial statements.

Financial Statements, Financial Analysis, Interpretation of Financial Statements

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† Researcher contributing first author.

Introduction

In the professional life of a professional accountant is necessary to make decisions that will affect the operational and financial future of an economic entity. For this, it has several tools to make an assertive choice; One of these are the financial statements that, unfortunately, not all accounting professionals know how to use correctly, resulting in making bad decisions.

Three main reasons are identified as grounds for poor and incorrect use of financial statements:

A) Academic

It is located in the teaching-learning process generated in higher education institutions; The teacher usually teaches them from a theoretical perspective emphasizing little or nothing in its correct elaboration, use, analysis and interpretation, so when the accounting professional is in front of one of these documents, he cannot take advantage of it, thus wasting one of the Best tools in accounting.

B) Bibliographic

The bibliography referring to the subject that is little or does not explain in detail how they should be elaborated and the uses that can be given to them in the real life.

C) Legislation

Ignorance of national and international regulations for the development of these tools, thus depriving the potential they possess.

Given the above, the following questions arise: How are financial statements prepared and interpreted? What are the causes why accounting professionals do not use financial statements correctly? How to properly train the accounting professional in the preparation of financial statements.

This paper aims to identify the causes why accounting professionals do not correctly use financial statements, explaining the procedure for preparing financial statements and how they should be interpreted and reviewed the tools that the accounting professional has to take of decisions.

Given the above, the work allows us to establish the application of a correct methodology in the training of accounting professional that will result in them being able to make an adequate preparation and interpretation of financial statements in fiscal terms, so that they can use them as a tool in the decision making of their working life.

The work is done within the Mexican territory and will be used by the accounting professionals who practice it as a tool for the correct preparation and interpretation of the financial statements in their educational training process.

This work will be elaborated in accordance with Mexican and international legislation applicable to the country in the area of financial statements. In Mexico, the Mexican Council for Research and Development of Financial Information Standards (CINIF) was created in 2001 and has worked over the years in analyzing, modifying and issuing Mexican regulations related to financial information in a manner which complies with international regulations and the needs of information users in Mexico.

Methodology

This work starts from the assumption that accounting professionals have deficiencies in the preparation and interpretation of financial statements, based on existing knowledge about financial statements as well as the legislation in force in this area and, together with this, the methods described in the research for As a whole, to apply them in a classroom of students who are close to graduating from the degree in public accounting, seeking to obtain as a result sufficient elements to test the hypothesis proposed.

The work has an explanatory scope in which it seeks to establish the existing relationship in the application of a methodology in the training of the accounting professional that allows the correct application and interpretation in fiscal terms of the financial statements for decision making, A quasi-experimental research design is used to identify certain factors that influence the professional accountant to use these documents as a tool in their working life, and seek to correct them through the methodology proposed, taking as a benchmark the level of assertiveness in the interpretation and elaboration of the financial statements that the students have before the application of the proposed in this work and to compare it with the results obtained after having acquired the techniques proposed for the correct use of these states.

Interviews were carried out with public accountants practicing the profession, in the public or private sphere, in order to know their opinion about the use of financial statements throughout their professional life, the usefulness and importance they have come to have in She and in turn get their point of view about the shortcomings presented by future accounting professionals in the preparation and interpretation of the financial statements.

Through the application of the mixed-type questions contained in the questionnaires, it was possible to identify the knowledge possessed by the undergraduate students regarding the preparation and adequate interpretation of the financial statements in fiscal terms prior to applying the methodology based on Problem resolution.

Teorical framework

Financial statements are commonly defined as documents that show the results of operations or activities carried out by an economic entity, its financial situation and the changes in it, at a specific date, in order to meet the needs of Information that has management and third parties interested in the company for decision making. (Pyle, White, & Larson, 1981, Rojas and Aguilar, 1996, Romero López, 2002).

According to Prieto, internal users are called "all those who are part of the business, that is, all those who use financial information in order to make corrective, projection and analysis decisions, all within the same company" (2009)

As for external users, Prieto (2009) mentions that they are all those who, outside the company, need to consult information about it to invest in it or to develop future commercial transactions. Among them are also, the lenders, suppliers, clients, the government, etc.

The Statement of Financial Position or Balance Sheet is commonly defined as the document that presents the financial situation of an economic entity at a given date expressed in monetary terms. It presents in detail the resources that the company has, the obligations it has with its creditors and the participation that the owners or shareholders have in it. This document allows, through its analysis, to know the solvency, liquidity and operational efficiency of the entity that issues it.

To present this information, it is classified and grouped into three main categories or groups: assets, liabilities and equity or stockholders' equity. In Mexico, the preparation of the financial statements is regulated by the Financial Information Standards. Added to this is also the provision by the Federal Tax Code in its article 28, sections I and II reflected in article 33 section VI of its regulation which states that "The records or accounting entries must: Formulate the statements of financial position, results, changes in stockholders' equity, origin and application of resources, as well as the verification balances, including memorandum accounts and notes to said states "(Chamber of Deputies, April 2014).

One of the errors that can be made by decision-makers in preparing, reading and analyzing accounting documents is not to consider inflation, understood as "the generalized and sustained increase in the general level of prices in a basket of goods and Representative services in an economy that causes a loss in the purchasing power of the currency "(Garcia Briones, 2010, p.21), and it is then when accounting should be made adjustments, modifying the figures contained in the financial statements in order to recognize the effects Which had inflation on sales, assets, liabilities, profits and financial positions (Huesca Jimenez, 2005).

Garcia Briones (2010) mentions that the correct way to make these adjustments is to apply any valuation technique that allows updating historical values or discounting future values to bring them to present value; That is, to bring the amounts into constant and real prices. "In applying the integral method, all items that make up the entity's financial structure, without exception [...] should be classified as monetary or non-monetary".

Monetary items are those whose nominal value does not change due to the effects of inflation, which, as a result of this inflation, does not have a deterioration in their value. The most common monetary assets are cash, financial instruments and accounts receivable, while the most common liabilities are bank loans, suppliers, salaries payable and taxes payable (Domínguez Orozco, 2009; Instituto Mexicano Of Accountants, AC, 2013). On the other hand, non-monetary items are those whose nominal value varies according to the behavior of inflation and, in the case of the balance sheet, are identified within the non-monetary assets most common to inventories, property, plant and equipment, Intangible assets, permanent investments in shares and advances to suppliers; On the other hand the most common non-monetary liabilities are the provisions that reflect a commitment of payment and the advances to clients; And in terms of stockholders' equity all items that comprise it are non-monetary items (Domínguez Orozco, 2009, Instituto Mexicano de Contadores Públicos, A.C., 2013).

For a correct analysis and interpretation of the financial position statement it is necessary to study and analyze the financial information contained therein by means of tools and methodologies that allow to carry out the process of decision making in a simpler way.

Financial indicators are one of these tools whose function is to show the relationship of a number with another within the financial state of a company allowing to weigh and evaluate the results of the company's operations. The main indicators or financial ratios assess the profitability, liquidity and utilization of the assets and liabilities of the company (Romero López, 2002, Guajardo Cantú & Andrade de Guajardo, 2008)

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The Statement of Comprehensive Income or profit and loss is the financial document that shows the difference between the amount of income and expenses of an economic entity for a certain period, which will be called profit or loss as appropriate and will serve to Users of financial information are able to evaluate potential changes in future economic resources to predict the entity's potential to generate cash flows and to estimate the efficiency and effectiveness with which these resources can be used and with this Make the necessary operational decisions to improve the profitability of the business. The gain or loss obtained modifies the stockholders' equity of the economic entity in the Statement of Financial Position (Moreno Fernández, 2002, Guajardo Cantú & Andrade de Guajardo, 2008).

The effects of inflation in the Statement of Income in accordance with NIF B-10, which states that all the elements that comprise it, such as income, costs and expenses, must be expressed in monetary units of purchasing power to date of the closing of the General Balance determining.

The correct interpretation of the Income Statement will allow the user to know the profitability of the business by presenting in summary form the transactions related to their income and expenses to know the profit or loss and to make decisions to measure risks in future actions and to identify cost and expenses items With potential to decrease to increase the company's profits (Quevedo Ramírez, 2004).

The Statement of Changes in Stockholders 'Equity is the financial statement that reflects changes in an entity's stockholders' equity during a particular accounting period, arising from decisions made by its owners in relation to its investment in that entity

The purpose of the Cash Flow Statement is to provide information about the entity's income and cash payments, operating, investment and financing activities by informing users of the source of funds that the company has used during A period as well as the use that has been given during this time so that the company has sufficient tools to perform diagnoses related to the entity's ability to obtain external financing and determine if the company is growing with resources generated by Itself or by reason of these amounts obtained from third parties and will also know its capacity to generate positive cash flows.

The errors that are generated in the financial statements are omissions or inaccuracies in the information that this reflects caused many times by mathematical or administrative errors in the accounting records, erroneous application of the Financial Information Norms or by a misinterpretation of the existing facts which prevents them from being a reliable source for decision-making. On the other hand, there are errors that are generated intentionally and whose objective is the generation of an embezzlement and the falsification of the company's records, which is considered as a crime for people who engage in this practice (Segura López, From September 3 to 7, 2007; Vélez-Pareja & Hurtado-Carrasquilla, 2010)

It is important to remember that an error in the financial statements can be considered as a tax offense and be sanctioned with three months and up to nine years of imprisonment depending on the amount of the defrauded amount as determined by the tax authority according to As stipulated in article 108 of the Fiscal Code of the Federation (Chamber of Deputies, 2014, Ramirez Torres, 2014)

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It is common that, as a result of the normal operations of a company, there is a disparity in interpretation in the tax and accounting field, and the identification of such differences is of great importance. To achieve this, we have as a tool the preparation of an accounting-tax reconciliation of the result of a given period. This instrument consists of taking the accounting profit or loss, as the case may be, and adding or subtracting from it those items that are specific to financial accounting or tax calculations to arrive at the taxable profit or loss of the period (Escribano Mezo, 2005).

Results

On the basis of the study developed in Adequate Interpretation of financial statements in fiscal terms in the training of accounting professional, the survey carried out surveys of the students of the degree of Public Accountant and Finance of private university of the city of San Luis Potosí where Took the seventh-semester students of this course as a universe and a 100 percent sample was chosen to have 99 percent certainty, a 50 percent response distribution, and a 3 percent error. In addition to interviews with professionals from both public and private companies, it was useful for the technique of gathering information and in the second stage a survey and a practical exercise resolution application was applied in a classroom of a public institution, which same will be done to students of a public institution (Medellín Ramírez, 2016).

Interviews to undergraduate students.

The most representative results were as follows:

- The student population surveyed has an average age of 22.3 years of which two thirds are women and the rest are men.

- 89 percent of the students stated that they knew that it was a financial statement and the remaining part did not answer the part of the survey where they were asked about this, indicating that they know the generalities of the financial statements, but their answers to the survey allowed to identify that they do not really know them thoroughly.

- Although all the students surveyed studied the degree under the same curriculum differed in the number of subjects studied in which they saw the issue of financial statements since 33.3 percent said they had seen them in a range of 1 to 3 subjects While 22.2 percent said they had seen them from 4 to 6 subjects; Another 22.2 percent said they had seen the subject between 7 to 10 subjects and the rest said they studied them in more than 10 subjects. This reflects the fact that the students have not really given adequate importance to the study of financial statements since neither between themselves agree on the times that they have seen them during their degree and if they studied the same number of times Your answers should be similar.

- All students stated that they had learned how to prepare financial statements in school, but it is important to note that 56 percent of them also indicated another place where they learned them as was the case with their work, the social service or a graduate. Which reflects that although they saw them during their career, the instruction received there was not enough since they had to complement their training elsewhere.

In relation to the Statement of Financial Position:

- Twenty-two percent of the students surveyed said they knew him, and only half knew how to elaborate, analyze, and interpret it; Uses it now and makes decisions from it while the other half does not.

• Of the remaining part of the students who said they did not know it, 57% said they know how to elaborate and analyze it, which is illogical since it contradicts what they indicated about not knowing it. Half of the latter said that they also know how to interpret and use it and only half of them make decisions from them.

• Following the application of this survey, it was commented with them that the Statement of Financial Position is the same as the General Balance Sheet and it was due to ignorance of the formal name of this financial statement that they stated that they did not know it.

In the case of the Statement of Profit and Loss:

• A third of the students surveyed indicated that they know the State of Profits and of them 33% indicated that they only know how to analyze it, while the others said they know how to elaborate it, analyze it and interpret it, and indicated that they currently use it even though only half of them make decisions from it.

• The two thirds who did not know it indicated that they know how to prepare it, which contradicts the fact that they declare not to know it. Two thirds of the latter who manifest know how to elaborate it indicated that they also know how to analyze, interpret and use it.

Regarding the Statement of Cash Flows:

• 44 percent of the students surveyed indicated that they know and know how to prepare the Cash Flow Statement. However, only 75 percent of them said they know how to analyze and interpret it. Of the latter, 66 percent of them reported that they currently Use it although only half of them make decisions from it.

• The part of the students who stated that they did not know it indicated that they know how to prepare it, which contradicts the fact that they declare that they do not know it.

• 40 percent of the students who said they did not know it but if they knew how to do it they indicated that they also know how to analyze and interpret it and half of them stated that they are currently using it.

In the section on the Statement of Changes in Stockholders' Equity:

• Fifty-six percent of the students surveyed said they knew it, but only 40 percent of them said they knew how to analyze and interpret it and said that they currently use it although only half of them make decisions based on it.

• The part of the students who stated that they did not know it indicated that they know how to prepare it, which contradicts the fact that they declare that they do not know it.

• Half of the students who said they did not know it but if they know how to do it, they indicated that they also know how to analyze and interpret it and 50 percent of them stated that they are currently using it.

With reference to the 4 basic financial statements, the following could be determined:

• 44 percent of the population surveyed said they know how to prepare them, which represents a significant lack of knowledge on the part of students regarding the issue of financial statements.

• 11 percent of the students surveyed indicated that they make decisions based on financial statements, which means that students are wasting the financial tool because they do not know how to use them properly.

- 89 percent of the students surveyed stated that they were working and all of them indicated that they used the financial statements in their work, which corroborates their importance and usefulness in professional practice and contradicts the fact that only 22 percent of Students pointed out how to use them when asked specifically for each of the basic financial statements.

- 56 percent of the students surveyed said they would use the Cash Flow Statement if asked to evaluate a company's liquidity while 33 percent said they would use the Income Statement and the rest said they would use both That par excellence is the State of Financial Position that should be used for the purpose of knowing it since from there are obtained the data to be used to determine the financial ratios of liquidity so that it can be corroborated that the students do not know how to analyze the financial statements And contradicts the fact that 33 percent of them said they know how to do it.

- Only 22 percent of the students surveyed said that if asked to evaluate the profitability of a company would use the Statement of Profit and Loss which is the most used to achieve it since from there you obtain the data to be used to determine The financial ratios of profitability while 44 percent of the students answered that they would use the Statement of Financial Position, 22 percent said they would use the Statement of Profits and the rest said they would use the Statement of Changes in Stockholders' Equity by Which can determine that students do not know how to analyze financial statements correctly.

- All students surveyed considered financial statements as a tool for decision-making.

The same study (Medellín Ramírez, 2016) applies a survey and for work purposes the students were divided into two groups: 50 percent was allocated as a control group and, therefore, will not work with it to be able to contrast The progress achieved with the other 50 percent; The latter group had to solve a second diagnostic instrument consisting of a case study; The objective of this is to determine the usefulness of the financial statements in the academic and professional field and in turn corroborate if the manifested by the students in the first diagnostic instrument is fulfilled since there is a difference between what is said and what is Can perform. This study determines the following:

- 100 percent of students have a general understanding of the four basic financial statements; however, they presented some deficiencies in the process of elaboration and presentation of these.

Regarding the Statement of Financial Position or Balance Sheet, it was identified that:

- 100 percent of the students know how to prepare it both in the form of a report and an account according to what they said and to resolve the case 75 percent chose to do it in the form of an account and the remaining part did so in the form of a report

- 25 percent of the students had problems with the presentation of the accounts that make up this financial statement since they reflected the short-term asset accounts without being careful to indicate them according to their availability as with the asset accounts long term; It was also observed that half of the students were not able to correctly classify the accounts that belong to this classification since they confused them with items of intangible assets or liabilities. 25 percent of the students omitted asset items which affected the balance of the asset and did not allow double entry.

- With regard to liabilities accounts it was observed that 50 percent of the students had errors to present them according to their exigibility and according to their classification in the short or long term.

- Stockholders' equity was generally indicated by 75 percent of the students, since they were not classified in capital and contributed and 25 percent of them omitted accounts that make up the capital. Affected the balance of capital could not square the financial statement.

Regarding the realization of the Income Statement, it was observed that:

- Seventy-five percent of the students failed to identify the different uses of this financial statement, which made it difficult for them to calculate some of the requested financial reasons and 25 percent of the students who were unable to carry out the cost of sales calculation Under the argument that they did not remember how it was made, so that being this one of the first data in this financial statement resulted in that being incorrect, all other information was also wrong.

- Regarding the realization of the Statement of Changes in Stockholders' Equity, it was observed that:

- No student was able to properly elaborate this financial statement and even 75 percent did not even try to do so. The students said they did not remember how it was made. It is important to note that on the day of the case review with the students, the investigator noticed that the case could be elaborated more precisely by specifying in more detail through the drafting the movements of the company during the exercise to facilitate the process Of elaboration by the students; However, the non-inclusion of these details does not preclude the elaboration of the same.

- It was also possible to identify that 75 percent of the students know two different methodologies to elaborate this last financial statement according to what they commented on the day the practical case was applied.

Regarding the realization of the Statement of Cash Flows, it was observed that:

- No student succeeded in doing it correctly and there were 25 percent of students who did not attempt to solve it under the premise of their ignorance. It should be noted that in the school level in which this group is investigated this topic should already be of their full knowledge.

- In addition to the above, during the application of the case study and at the time of its revision, it was observed that all the students who tried to elaborate it presented doubts as to the classification of the items that integrate this financial statement.

Interviews with Professionals

In the same study (Medellín Ramírez, 2016), it proposes to corroborate the information obtained in the diagnostic tools with the aim of obtaining a broader picture of the current situation observed by the accounting profession in the professional performance and the recent graduates in terms of utilization Of the financial statements. As a result of this, the following could be concluded:

- 100 percent of them use financial statements in their professional practice and consider them as an important instrument both for the performance of their work and for decision-making.

- All the interviewees agree that there are currently companies that only perform them because it is a fiscal requirement but they do not use them as tools to improve their operations.

- 67 percent of the respondents stated that their academic instruction in financial statements was not adequate and that it was in professional practice that they actually learned them and that the respondents who stated that they had received a correct academic education also stated that Professional practice was an important factor in the process of learning the financial statements.

- 100 percent of the interviewees hire students from recent semesters of undergraduate or newly graduated professionals and agree that they are not well prepared to prepare and interpret financial statements.

- Two-thirds of the interviewees agreed that within the main deficiencies identified in the students of recent semesters of undergraduate or newly graduated professionals is the fact that they do not know the tax legislation applicable to the realization of financial statements both in the field Public and private.

- All interviewees agree that they need common sense and logic from the time of recording the operations that are part of accounting which is reflected in that they prepare the financial statements incorrectly and therefore cannot make decisions From this and even worse that this is the reason that the users of the information can make a wrong decision.

- Two-thirds of the interviewees consider that there is sufficient and adequate bibliography for the learning of the financial statements and the party that does not consider it so stated that there is an adequate diffusion of the existing bibliography at the undergraduate level.

All the interviewees said that within the same accounting profession there is not enough knowledge on national and international financial statements and that accountants make the financial statements in an archaic way or just to comply with the forms they give The tax authority to meet the tax obligations which have been in constant change for what they comment that the accountants must update on this matter urgently if they do not wish to fall in the commission of possible tax crimes.

Conclusions

It is necessary to prepare the Financial Statements, since they represent the final product of the work of the accounting professional, so it is of the utmost importance that the latter prepare and interpret them adequately.

The purpose of the preparation of the financial statements is to act as a basis for the decision-making process by the various users of the information and to comply with tax obligations and comply with the applicable regulations.

For the purposes of the correct expression of the financial statements in monetary terms, it is necessary that the accounting professional be able to classify the items that integrate them into monetary and non-monetary when, due to the effects of an inflationary environment, their restatement is necessary.

For the correct evaluation of the economic situation of an entity there are different methods such as the use of financial reasons. It is essential that the accounting professional is aware of the entity's turn and the way in which it carries out its operational activities as well as the way in which it was legally constituted to have an adequate judgment.

At the present time, the accounting professionals who have graduated from the undergraduate degree do not have the academic and professional preparation sufficient to correctly elaborate and analyze the financial statements or, the knowledge is not applied continuously in other subjects or they are memorized just to approve.

Regarding the registration of the operations, it was concluded that the students of the last semesters do not know how to give the appropriate tax treatment to the activities of an entity due to the lack of knowledge of the current national and international regulations.

The methodology based on problem solving that was used in this research was an important and effective tool for teaching the preparation of the financial statements since in the first diagnosis, no student was able to correctly develop the financial statements and after applying the Student was able to emphasize his learning through the accomplishment of problems during the course through which he obtained the abilities to develop similar cases and this could be verified in the last evaluation applied the totality of the students could elaborate the financial statements of correct form.

The application of this methodology allowed the student to work individually and in a team which, beyond helping them to pass a subject, gives them tools to be able to perform fully as professionals since in their practice they must work both ways to interpret financial statements And make decisions based on them and thus improve the situation of the economic entity to which they render their services.

It is one thing to know the preparation of financial statements and another thing is to know how to analyze and interpret.

The recommendation is made to higher education institutions to develop their academic programs in a comprehensive way so that there is an interrelation of knowledge and the continuous application of knowledge in the subjects that comprise it.

The teacher represents an important factor in the problem that currently presents the learning process of the financial statements in the higher education institutions of the country, so the teacher, must be very well prepared in the matter and be updated in accounting , Fiscal and financial, and apply pedagogical methods so that the teaching-learning process is applied correctly.

Aknowledgement

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Financial report of an aquaculture production unit

PÉREZ-ROSAS, Leonardo*†, CORTÉS-MARTÍNEZ, Silvia Edith, GONZÁLEZ-HERNÁNDEZ, Rodrigo Cristóbal and DIEGO-ESTUDILLO, Oscar

Universidad Tecnológica de Izúcar de Matamoros

Abstract

Aquaculturists located in the Mixteca Poblana region, have found in this activity an opportunity for economic development, representing an additional source of income in the absence of jobs in the same area. However due to the lack of professionalism of these Units Aquaculture Production (UPA's) is difficult for the producer to determine whether the company is profitable. The objective of this research is to know the financial situation of a farm dedicated to the production of channel catfish (Ictalurus punctatus), through a preliminary diagnosis to identify areas of financial opportunity in it. With the identification of costs, income determination, integration of earnings report and application of financial reasons, it was concluded that the financial condition of the company is unfavorable because it has losses in the crop cycle catfish analyzed in the present study. This research highlights the need to professionalize this type of micro-enterprises to achieve their healthy development and continued market.

Financial diagnosis, aquaculture sector, financial administration

† Researcher contributing first author.

Introduction

The economic context of the MiPymes in Mexico requires measures and strategies that allow them to survive in the market, surpassing the threshold of life that in our country is around 5 years on average (Business Advisory Council, 2013).

In particular, micro and small companies in the agroindustrial sector share characteristics that allow them to be generators of development in the communities where they are located, mainly to take advantage of the natural resources that they obtain from the same place. In this research work, an approach to a micro-enterprise of the primary sector known as "El Oasis", is an aquaculture farm dedicated to the production of catfish, located in a rural town south of the state of Puebla, with only 2 years operating entrepreneur hopes to develop its production unit.

The objective of the present investigation is to inform the entrepreneur about the financial result obtained in a productive cycle (8 months), in order to identify if there is a profit or loss in the same.

Catfish (Ictalurus punctatus) is a freshwater fish, according to the FAO Aquaculture Information Program, it is said that catfish farming developed rapidly during the 1960s and 1970s and the commercial industry developed in the south Of the United States of America (RR, 2004). At the national level catfish production has increased, going from 4,434 tons in 2011 to 8,903 tons in 2014 (SIAP, 2014). In 2010 Sinaloa was the main entity of catfish cultivation when participating with the 25 percent of the national production (860 tons); Followed by Tamaulipas, 21 percent (707 tons); Durango, with 13 percent (426 tons); Michoacán, with nine percent (304 tons), and Sonora, with six percent (201 tons) (Conapesca, 2011).

As shown in Figure 1, for the year 2014 the main state of catfish was Guerrero with 21.89 percent of the national production (1,948 tons), followed by San Luis Potosí with 13.01% (1,158 tons), Sonora on 10.03 % (893 tons), Sinaloa (9.68%) (861 tons) and Tamaulipas with 7.91% (704.38 tons).
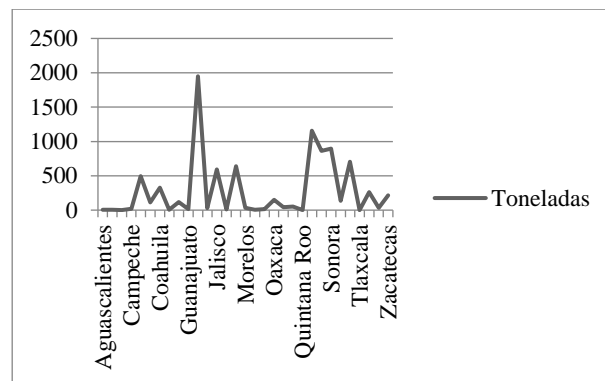
Graphic 1 Catfish production by state, year 2014. *Own elaboration. Source SIAP 2016.*

Puebla occupies the 17th place in the catfish producing states with a production of 43.6 tons, noting that 80% of this production comes from the Units of Aquaculture Production (UPA's), located in the Mixteca Poblana region, to date There are 16 Catfish Production Units located in the municipalities of: Jolalpan (7 UPA's), Chiautla de Tapia (2 UPA's), Chietla (2 UPA's), Tlapanalá (1 UPA), Izúcar de Matamoros UPA), Teotlalco (1 UPA), Coatzingo (1 UPA) and Piaxtla (1 UPA).

The Aquaculture Production Units mentioned above are in the process of being professionalized, the Catfish Product System Committee of the State of Puebla is in charge of training and advising them on technical aspects, but the management of these units is empirical, so they need to implement Administrative tools that allow them to control their resources, developing strategies to be competitive in the market.

These companies are integrated in a Civil Association called "Union of Catfish Producers of the State of Puebla", they are dedicated to commercialize the fish without giving an added value, however, they are already realizing the necessary tests to transform it and to commercialize it in different presentations to obtain a greater income, thus joining the agroindustrial sector.

The company "El Oasis" has no financial control, which has halted its healthy growth, the producer does not know if he really gets a profit because of the economic activity he develops. As a hypothesis, it is stipulated that an aquaculture enterprise must maintain a high production and crops of different species so that the income exceeds the total costs and a profit is perceived in each financial year.

Literature review

The Food and Agriculture Organization of the United Nations (FAO) defines aquaculture as "the cultivation of aquatic organisms both in coastal and inland areas, which involves interventions in the breeding process to increase production The United Nations for Agriculture and Food, 2016).

Aquaculture, according to Dr. Idyll, is "the technique that allows to increase the production of aquatic animals and plants for human consumption, through some control of organisms and their environment" (C.P, 1974). The issue of aquaculture has become relevant in Mexico in recent years, according to the magazine of the Chamber of Deputies, by 2014 "aquaculture has a food production per hectare three times higher than that of agriculture and livestock and a worldwide growth rate of around 30% per annum "(Chamber of Deputies, 2014). It also refers to the fact that this activity is of great importance both for food security and for the generation of jobs.

The aquaculture activity in Mexico has been disturbed when sanctioned by federal authorities, on the effects that it causes in the ecosystems when it is made a mismanagement of the same one. In 2015, the Federal Environmental Protection Agency (PROFEPA) initiated a program to comply with environmental regulations in the aquaculture sector, which would inspect the more than 9216 aquaculture production units registered in the country, Established in the General Law of Ecological Equilibrium and Protection to the Environment, of not doing so would be credited with fines (ACUÍCOLA, 2015). This becomes a threat to the capital of the aquaculture entrepreneur, lacking adequate sanitary controls and management.

There are studies that indicate the profitability in the catfish culture of channel where they estimate that the profit obtained per kilogram is from $ 12.00 to $ 15.00, in turn it is revealed that one of the main costs in the production, is the purchase price of the Food, to reduce it, producers must purchase it by volume to reduce said cost (Catre Michoacan Product System AC, 2012).

Concerning costs, "the purchase of land and the development of large pond complexes represent the highest fixed cost for catfish farmers. The highest variable cost is food, which typically accounts for 40-45 percent of the cost of operations, "according to FAO reports (R.R, 2004). In a similar thesis, it was found that the catfish farm that was studied in that specific case, obtained losses in the productive cycle analyzed, the cost benefit ratio was 0.73 in a first period and 0.91 in a second period Of production, which indicates that the company's revenues do not surpass the total costs, the reasons point to lack of control in the management of the feeding, excess of fixed costs, low production and lack of infrastructure (Jimenez Hernandez, 2008)

The profitability of a company or project is that the value provided by the yields is greater than the resources it uses (Companys Pascual & Corominas Subias, 1988). The cost is the monetary value of the resources that are delivered or promised to be delivered in exchange for goods or services that are acquired. At the time of acquisition, a cost is incurred (García Colín, 2014). Costs are "the sum of the expenses incurred by a natural or legal person for the acquisition of a good or service, with the intention of generating income in the future" (Ramirez Padilla, 2005). According to Ramírez Padilla, costs are classified according to their behavior in: variables, which are those that fluctuate directly with production and the fixed costs that remain constant for a time without being directly dependent on the volume of production. A company reaches its break-even point, when the total revenue it receives covers the total costs, so that the company will not have losses or profits, so to determine it is known as cost-volume-utility analysis (Garcia Colín, 2014). To determine if a company or project perceives a profitability, the financial ratio known as cost-benefit ratio is used, which shows the amount of money that returns for each monetary unit invested, when the ratio is equal to "1", the company does not When the ratio is greater than "1" indicates profits and when it is less than "1", it represents losses (Herrera, Velasco, Denen, & Radulovich, 1994).

Methodology

For the present study a descriptive analysis was made, based on the information collected from bibliographical sources, interviews with the owner of the "El Oasis" aquaculture farm and field visits. Costs were classified according to their performance, that is, in fixed and variable costs, revenues were determined based on the kilograms sold at the sales price, a statement of results was elaborated, the cost-volume-utility analysis And the cost benefit ratio.

Results

According to field visits and interviews with the owner of the "El Oasis" aquaculture farm, the following information was obtained:

• The owner lacks professional training, runs his business empirically.
• The aquaculture farm has 2 ponds qualified to produce, 7 more ponds are under construction.
• The cost of the fry is $ 3.00 and is purchased in the state of Michoacán.
• The entrepreneur considers that the sales revenues are his profits.
• The entrepreneur does not have adequate records of income and expenses.
• The current production capacityy per pond is 400 kilograms.

A) Fixed Costs: The costs incurred by the company Oasis in a productive cycle (7.5 months) are shown in table 1, which highlights that the highest of these is the payment of salaries, calculated on the basis of the salary which workers receive at least in the Mixteca Poblana.

Concept	Amount per productive cycle
Administrator	$ 23,040.00
Gas sales, deliveries	$ 2,000.00
Electric power	$ 4,800.00
Employees	$ 19,200.00
Water	$ 800.00
Telephony	$ 800.00
Gasoline	$ 3,200.00
Unforeseen	$ 6,400.00
Amortization	$ 7,826.67
Depreciations	$ 3,883.83
Total	$ 71,950.50

Table 1 Fixed costs per productive cycle. *Own elaboration*

B) Variable costs: Variable costs were determined according to the inputs needed for fish development. Table 2 shows the total cost corresponding to the purchase of the fry (catfish in the initial stage), food for the stage of Development and food for production stage.

Cost	Rode Per cycle
Food development	$ 15,551.50
Food production	$ 1,842.00
Juvenile	$ 6,900.00
Subtotal	$ 24,293.50

Table 2 Variable costs per productive cycle. *Own elaboration*

C) Sales revenue: The sales of the company begin when the catfish reaches maturity, starting in week 25. The revenues reported for the production cycle analyzed correspond to a production of 450 kg, at a price of $ 80.00 the kilogram, obtaining a total of $ 36,000.00 as shown in table 3.

	Months 1-6	Months 7	Months8	Total
Bagre (kg)	-	300.00	150.00	450.00
Cost/kg	$ -	$80.00	$80.00	$80.00
Sales revenue	$ -	$24,000.00	$12,000.00	$36,000.00

Tabla 3 Ingresos obtenidos por ciclo productivo. *Elaboración propia*

C) Income statement: The information was concentrated in an income statement for the productive cycle analyzed, as shown in Table 4.

"The Oasis" Income Statement Productive cycle	
Customer Service	$36,000.00
Variable costs	$24,293.50
Gross profit	$11,706.50
Fixed costs	$ 71,950.50
Result of the excersice	-$60,243.50

Table 4 Income statement by productive cycle. *Own elaboration.*

The income statement results in a loss of $ 60,243.50, due to the fact that total costs exceed the income received.

D) Break-even point: the number of kilograms that the company must sell was determined in order not to have losses or gains. Obtaining the result that gives the formula 1.

$$P.E= CF/(1-(CV/V)) \qquad (1)$$

$$P.E= 71,950.50/\{1-(24,293.50/36,000)\}$$

$$P.E= \$221,261.69$$

The aquaculture production unit must sell $ 221,261.69, to reach its break-even point. That is equivalent to selling 2,766 kilograms per production cycle, and currently only produces 450 kilograms, so it is well below its break-even point.

E) Cost-benefit ratio:

$$RBC=Beneficios/Costos \ Totales \qquad (2)$$

$$RBC=\$36,000.00/\$96,244.00$$

$$RBC=0.37$$

The result of the cost-benefit ratio tells us that for each peso that was invested they recovered 37 cents, reason why it is losing 63 cents.

F) Projection: Now we calculate the projected net profit to a maximum production capacity, the company needs to use the 9 ponds (of which 7 are currently under construction), to reach a profit. When sowing fry in 100% of the ponds would yield a production of 3,600 kg, the proceeds would amount to $ 288,000.00 (at a price of $ 80.00 per kg), variable costs would reach $ 196,202.46, while fixed costs would remain at $ 71,950.00, therefore the net profit would reach $ 19,847.04.

"The Oasis" Income Statement Projected production cycle	
Customer Service	$288,000.00
Variable costs	$196,202.46
Gross profit	$91,797.54
Fixed costs	$ 71,950.50
Result of the excersice	$19,847.04

Table 5 Income statement by projected production cycle.
Own elaboration

Conclusions and recomendations

The aquaculture production unit generates losses in the current productive cycle due to the production in the same is low, with it only covers variable costs, fixed costs outweigh the income.

The employer does not consider or record the fixed costs, because the workforce is represented by his family, the electric energy is the same that is used for the home, ie there is no separation between family expenses of the expenses of the company. The contribution margin per kilogram is $ 26.00, equivalent to 48% of the cost of production.

The company can reduce its variable costs, acquiring the food by volume, that is, in conjunction with the producers of nearby farms. To reduce the cost of the fry, it is necessary to have an incubator in the state of Puebla to reduce the cost of the same, since the cost of moving other states reduces profits.
In order for the company to generate profits, it must use 100% of its installed capacity.

The company must keep records of all expenditures and income, to maintain control of the same. It is necessary the participation of the education sector in this type of organizations, to achieve a professionalization in its activities and to be competitive in the market.

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Curricular reform: Tourism administration, BUAP as a strategy for regional development

PEREA-BALBUENA, José Ángel†*, ZAMORA FERNÁNDEZ, María de los Dolores, RODRÍGUEZ OCHOA, María Yolanda, and CARRASCO ROMERO, Víctor Josaphat

Universidad Tecnológica de México

Abstract

The city of Puebla, was conceived as a social, economic and religious experiment. This was an early growth what was considered the second most important city in the Viceroyalty; This allowed the establishment of religious orders such as the Jesuits who, in 1578, founded the College of the Holy Spirit antecedent of the Autonomous University of Puebla. The city of Puebla in the 80's became as an educational enclave of the Gulf-central part of the country, settling in its territory higher education institutions private court. They began to teach the tourist discipline in its various forms. Given this educational dynamics, the Autonomous University of Puebla, considered important tourist aperturar the discipline and in August 2000, the Bachelor implemented in Tourism Administration. Today has an enrollment of over 1,500 students and is one of the five options enrollment. Tourism represents an important development tool strategy for our country, the update is relevant university curricula for students to have better knowledge and updates, allowing make tourism a strategic element.

Curricular Reform, Tourism, Regionalization, Curriculum

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* Correspondence to Author (email: perea_angel@hotmail.com)
† Researcher contributing first author.

Introduction

The Tourism Management Program emerged within the Benemérita Autonomous University of Puebla as a response to the region's social demand, taking into account the facts and tendencies of the region to adapt its contents and achieve, through its graduates, a positive impact on The society, that is materialized in the increase of the productivity and professionalism of the tourist services. (Perea Balbuena & Lopez Palacios, 2008)

This educational program was authorized by the H. University Council in May 2000 and began its implementation in the fall 2000 period (August 2000). This plan was integrated into two general areas: Administrative Area and Tourism Area, complemented by common university subjects.

The current curriculum for the Tourism Administration career dates back to 2009, the date of the last reform. "A year in which a curricular reform was carried out based on the Institutional Development Plan (PDI) 2001-2009 of the Autonomous University of Puebla (BUAP), which expresses the commitments that will respond to the challenges that Come from the global changes, derived from the process of globalization and internationalization; The situation of higher education in Mexico and the specific conditions within the institution." (Vice-rectory of Teaching, BUAP, 2007)

Sample of the above is the planned, inclusive and participatory work that was achieved during the design of the University Model Minerva (MUM), approved by H. University Council in the session of December 13, 2006.The degree in Tourism Administration of the University Model Minerva was implemented in the autumn 2009 (August 2009) with the following criteria:

Mission of the Educational Program

It is an Educational Program that attends to the needs of the tourism sector, with a multidisciplinary approach towards the new trends, challenges and globalizing processes presented by tourism systems, having a commitment based on human and moral values, achieving a social, economic, Environmental and cultural.

Vision for the 2014 Educational Program

To be an Education Program accredited by its quality and social relevance, leader in the training of professionals of the tourist area, that recognizes the strategic importance of the sector for the national economy; As well as obtaining and maintaining level 1 of the CIEES, with a certified teaching plant and infrastructure in accordance with the requirements of the program.

General Objective of the Educational Program

To form in a comprehensive way graduates in tourist administration with knowledge, skills, attitudes and values to exercise social and entrepreneurial leadership, capable of boosting the tourist activity; With equity between practical experience, the search for new knowledge, civic co-responsibility and social justice, contributing to the improvement of the tourism sector through research, the application of human values, community development in the framework of social balance, The sustainability of resources and the conservation of the natural and cultural heritage of mankind.

Specific Objectives of the Educational Program

The student:

- Develop leadership skills that enable them to manage tourism organizations.

- You will get entrepreneurship tools for the creation and management of tourism companies.

- It will promote community development through its incorporation into training programs and social integration with equity and respect for cultural diversity and the environment.

- It will apply administrative techniques for decision-making aimed at meeting the economic, social and cultural needs that society demands.

- It will strengthen their human and social formation for their personal development and professional practice.

- It will learn techniques, procedures and policies that allow it to promote the balance between tourism development and the conservation of the natural and cultural heritage for the achievement of sustainability.

- Develop research techniques focused on improving the tourism sector.

From then on, the professional practice of the Bachelor in Tourism Administration has been developing rapidly, considering the environment in which it is developed, so it is important to incorporate the elements that, due to technical and technological advances, Market and the evolution of the educational process itself, make it necessary to adapt the current academic program.

Based on articles 18, second paragraph, of the Law of the Autonomous University of Puebla, 102 and 106, fractions V and XXIII, of the Organic Statute of the Autonomous University of Puebla and 31 of the Basic Rules for Interim Integration And the functioning of the Academic Unity Councils, and in accordance with the Curricular Reform Agreement of the Academic Unit Council, dated February 10 of the current year, in order to continue and promote and develop a deep and responsible process of Comprehensive curriculum reform at the undergraduate level of its Educational Programs, the Faculty of Administration (FA) of the Autonomous University of Puebla (BUAP), convened the members of the academic community of this academic unit: teachers, researchers, students and non As well as to the graduates of this faculty, to participate individually and / or collegiate, in the process of curricular reform of the plans and programs of study of the degrees: Business Administration, Public Administration and Political Sciences, Commerce International, Tourism Administration, Gastronomy and International Business. Under the following premises:

I.   The principles to be considered for the improvement of curricula are: identity, originality, innovation, competitiveness and social commitment.

II.   Teachers, researchers, students, non-academic workers, graduates, employers, evaluators and social actors can attend without any limitation the following activities: Forum, Conferences and Seminars.

III.   Participation in the activities indicated in the previous point may also be made through presentations and / or proposals, which must be submitted in writing to the General Coordinating Committee and / or Special Commission by Degree.

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IV.   Teachers will be able to participate in the specific work commissions for each Degree, will be composed of 3 or 5 teachers. Any member of the Degree may participate, regardless of their category, educational modality and campus, always under the principles of responsibility, compliance and volunteer work.

General objective

Analyze, organize and compare the different curricula of the leading institutions at the national and international level in the field of tourism to identify subjects and areas of knowledge in order to contribute to the curricular redesign of the Bachelor in Tourism Administration.

Specifical objetives

• Analyze the national, regional and local tourist market in order to be able to respond to the needs of social development.
• Sort the corresponding subjects by area of knowledge.
• Examine existing subjects to assess their relevance.
• Select subjects according to the needs of the current tourist market.
• Assemble the Institutional Development Plan BUAP with the tourist growth of the entity.

Justification

Tourism is a phenomenon in constant evolution, integrated with a series of components that manage to form a complex system by the elements that take part in it: individuals in society with the need of displacement, but also receiving societies, settled in territories, possessors of heritage Natural and cultural, in many occasions with high power of attraction. On the other hand, the processes of displacement to these territories and the specialized services in the same.

Tourist activity also involves subjective elements related to the individual himself and his circumstances such as experience, happiness, leisure time and recreation. Tourism has managed to consolidate over time as an object of study, which migrated from travel to an activity that generates economic, social and environmental processes.

The World Tourism Organization (UNWTO) reported 25 million international arrivals in 1950, this activity has continued to grow despite the economic and social crises targeted in some countries.

Tourism activity in recent years has grown significantly, according to data from the UNWTO World Tourism Barometer, in 2014 international tourist arrivals totaled 1,138 million, an increase of 4.7% over the previous year (OMT, 2015).

This sector generates a relevant economic spill, to the degree that the nations have seen in it an opportunity for the generation of jobs, economic diversification and an alternative to the economic crises that have appeared in the last years.

Tourism in Mexico is considered the third source of foreign exchange after petroleum and remittances of the compatriots, represents 8.4% of the Gross Domestic Product (GDP) and 6.8% of the jobs depend on it (Vargas del Río, 2014).

In 2014, 29.1 million international visitors were registered, almost 5 million more than in 2013 and reached a record international foreign exchange rate of 16 thousand 257.9 million dollars (SECTUR, 2015).

Not a surprise for a mega country like Mexico. According to the United Nations Environment Program (UNEP or UNEP) it puts the concept of mega-diversity on the global agenda. There are 17 mega-diverse countries: Bolivia, Brazil, China, Colombia, Costa Rica, Ecuador, the Philippines, India, Indonesia, Kenya, Madagascar, Malaysia, Mexico, Peru, Democratic Republic of Congo, South Africa and Venezuela.

UNDP is a program that describes access to genetic resources and the fair and equitable sharing of the benefits derived from their use, highlights in point 6 the importance of biodiversity in America:

The region of Latin America and the Caribbean is distinguished by its particular richness in terms of biodiversity since it accounts for 40 percent of the world's biodiversity, bringing together 8 of the 25 recognized biologically richest terrestrial ecosystems in the world. Taken together, they contain more than 46,000 vascular plant species, 1,597 amphibian species, 1,208 reptiles, 1,267 birds and 575 mammals. More than half of the member countries of the Allied Mega Group of Countries, where 70 percent of the planet's biological diversity and 45 percent of cultural diversity are found, belong to Latin America (8 of 15 countries) (UNEP, 2003)

The strategic location of Mexico along with its natural and cultural wealth make it an attractive country for tourists of the mute.

Tourism in the country is based on the current tourist policy based on cluster and competitive groupings, one of the instruments most used to measure tourism competitiveness based on indicators commensurate with the Travel and Tourism Index of the World Economic Forum which has information available from 2007 in 139 countries around the world.

This index groups 70 indicators, based on three sub-indices: regulatory framework, business environment and infrastructure, human, natural and cultural resources. Mexico, under the lens of this instrument has had the following places in the international ranking and in the region of the Americas.

Mexico in the world		
Year	Internationposition	Position in the americas region
2007	49	
2009	51	6°
2011	43	4°
2013	44	5°
2015	30	4°

Table 1 Global position of Mexico according to the Travel and Tourism Index of 2007-2015
Source: World Economic Forum (WEF, 2015)

In the case of Mexico in the year 2014, a record number of international tourists was generated, who visited the country, reaching 29.1 million foreign visitors, generating 16.3 billion dollars (SECTUR, 2014).

The 2015 was configured as the year with more international arrivals registered in the history of the country with 32.1 million international arrivals. The latest results from the National Statistical Information System of the Tourism Sector of Mexico, Sectur noted that from January to September the average monthly expenditure of international visitors increased 0.5 percent at annual rate. The report reported that in those months (January to September) the arrival of domestic tourists to hotel rooms exceeded 38.8 million, which meant 75.9 percent, while the remaining 24.1 percent of arrivals to hotel rooms were tourists Foreigners (CANACO-SERVYTUR, 2016).

The arrivals of passengers in the airports that received the largest number of international visitors in that period were: Cancún with 5 million; Mexico City with 2.5 million; Los Cabos, 940 thousand 248; Puerto Vallarta, 857 thousand 475 and Guadalajara, with 570 thousand 048, which represent 90 percent of total movements in air terminals (CANACO-SERVYTUR, 2016).

For the state of Puebla, the number of national and international visitors in 2014 was 12,072,739 tourists and the economic spill of 11,203 million pesos. (Sectur Puebla, 2014) this translates into an increase of 18.3% over the previous year and 22.64% respectively. According to INEGI, transportation services contributed 16.8% of the value; Handicraft and other goods production activities 15.5%; Restaurants, bars and nightclubs with 10.1%, among others.

During 2014 the value added by tourism in the economy grew 2.2%, a rate similar to the 2.1% reported by the economy as a whole, according to the results of the "Tourism Satellite Account of Mexico 2014.

The main results of the Satellite Account indicate that the Gross Value Added Tourism (VABT) at basic prices represented 8.6% of the total Gross Value Added (GVA) of the country during 2014, at current values. (CANACO-SERVYTUR, 2016)

The gross tourism value added was integrated as follows: transport services contributed 16.8%; Handicraft and other goods production activities 15.5%; Restaurants, bars and nightclubs with 10.1%; Accommodation 8.8%; Timeshare and second homes 4.6%, and the rest of the services contributed 44.2% of the total.

The biggest contribution of jobs in the sector was in the services of restaurants, bars and nightclubs with a contribution of 36%, "other services" 25.5%, transport 16.3%, handicrafts and other goods 13.1 %, And accommodation services, recreation services, second homes and timeshare 9.1 percent (CANACO-SERVYTUR, 2016)

The importance of tourism in the national context is evident in Mexico, the tourism strategy accounts for its growth and is expected to guide the development of tourism.

Problem statement

In the State of Puebla there is a great offer of higher education with programs in tourism: 53 public and private universities have programs related to tourism and 38 of them are located in the Municipality of Puebla. The degree programs can be grouped in: Tourism, Tourist Administration, Gastronomy, International Tourism, Tourism Business Administration, Gastronomic Arts, Gastronomic Business Administration, Hospitality, Gastronomy and Restaurant Management, Hotel and Restaurant Management, University Higher Technician In Food and Beverage, Gastrotechnology, Advertising Communication, Institutional Nutrition, Tourism Management and Development.

The postgraduate programs are: Master's Degree in Social Sciences in the Tourism Management Area, Diploma in Senior Management of Restaurant, Hospitality and Ecotourism, Master's in Gastronomy and Master's in Hospitality, Master's in Management and Management of Tourism Companies, Management of Industry Hospitality and Tourism Business Management.

It should also be noted that the City of Puebla has a strategic location with respect to its markets of origin and the tourist routes of the east, south and southeast of the country.

It has the necessary infrastructure and urban services to support the development of tourism. It has a legal framework in its institutions and resources to develop tourism. It is the biggest destination of the World Heritage Cities. Its tourist influx is increasing and its visitors are mostly national, in the family and cultural segments; with a high educational level; Come from the Federal District and neighboring states motivated by closeness, culture and gastronomy; Are transported by land and have a high repeatability.

It has an offer of attractions and cultural tourism products some of them of international relevance, the most important being the city itself declared a World Heritage City. This offer is complemented by new attractions oriented to other segments of the market, such as: the Linear Park and its "Estrella de Puebla", the Convention Center, the Exhibitor Center, the Parque Africam Safari and others, also relevant, located in its surroundings.

Due to its size and economy, the offer of recreational activities, leisure and recreation of quality that is within reach of visitors. The offer of accommodation is sufficient and also of quality and is diversified by what is available to the different socioeconomic strata. It has means for the promotion and commercialization of its products. Derived from the above, the Benemérita Autonomous University of Puebla, being a leader in the higher education of the state and the region, raises the need to carry out a curricular reform in its curriculum, within which is the Bachelor of Tourism Administration, Which will implement in its restructuring the new tourism trends and the particular and regional needs of tourism.

Kind of investigation

In this research the Exploratory type was used, in order to familiarize ourselves with the study problem, to select the available resources and procedures, having done a Benchmarking of the curricula of the most recognized universities at national and international level, as well as Certifying bodies, which gave an overview of the pertinence of the subjects that are given in these areas.

In a second stage, descriptive research was used, which aims to expose the characteristics of the phenomena and has a diagnostic character. An analysis of the subjects that make up the 2009-2015 curriculum was carried out to determine the changes in the Curriculum that requires the tourist activity and the professional of today.

As far as the applied research methods were the Inductive and the Analytical that consists of decomposing the whole in parts to understand its scope and complexity, the contents of all the subjects of the curriculum of the aforementioned curriculum were carefully reviewed to determine which subjects must remain, In which it is necessary to change some contents to enrich them and to update them, as well as which they must be introduced in the curricular reform.

Subjects

In order to carry out this research, different actors that resort to the tourism sector were used, such as professionals, entrepreneurs of the sector, professors, academic researchers, students and graduates.

Instruments and / or Materials

For documentary research the following sources of information were used; The national and state regulations and the institutional normative framework to give legal support to the present document, as well as sources of a technological nature such as visits to websites of agencies and institutions in the tourist area. The instruments for the field research: direct observation, interview and questionnaire that provided the necessary information for the achievement of the objective, which is to achieve the modification of the study programs that improve the outgoing profile required by the current tourism market.

Procedure

Two internal forums were held: "Internal Forum within the Framework of Curriculum Reform; The Future of the Faculty of Administration. A prospective of the Faculty in the XXI century "and Seminar of the Curricular Reform" Our plans of study ". Reengineering: New design, added value, innovation, social commitment and competitiveness, having participated teachers, students and administrative staff of the Faculty of Administration (Ciudad Universitaria and Regional Campus). Also, two external events were held: "External Forum in the Framework of Curriculum Reform; Cycle of Conferences, a look towards our programs. The external vision ", and Permanent Seminar of Tourism" Tourist Destinations in Heritage Areas "; These activities included academics, researchers, professionals, employers, opinion leaders and graduates. It is important to note that the curricular structure considers the area of Disciplinary Integration, which promotes the relationship between theory and practice, is made up of two sub-areas: Critical Professional Practice and Integrative Subjects, in addition to considering two categories of elective subjects.

The disciplinary and complementary, with the purpose of offering the student the opportunity to specialize and deepen in the areas the disciplinary knowledge and to improve the integral formation of the student, according to the new trends of the tourism, these subjects can be studied in other Institutions Of Higher Education, in the national and international scope through the program of mobility and academic exchanges.
BUAP offers the Tutoring System for Integral and Pertinent Student Training (SITFIPE), composed of Academic Tutors (teachers) and students, under the scheme called Mentoring, who will support students in the achievement of the Learning objectives set out in the EP in order to achieve their academic and personal goals.

Final product

The design of the organization of the study of the professional discipline of Tourism Administration to obtain the title of Graduate in Tourist Administration is based on the University Model Minerva: it establishes as central axis: the integral and pertinent formation of the student; With a participative pedagogical social teaching orientation (socio-cultural constructivism).

The structure of the curriculum reform is based on the correlated and transversal curriculum; The first one favors the vertical links between the basic, formative and specialization levels, as well as horizontal links between the contents of the subjects that make up the areas of knowledge of the Educational Program (PE); So that students will gradually integrate the knowledge, attitudes, values, skills and abilities to exercise an entrepreneurial leadership, with creative capacity to boost the tourism system, as established by this PE's graduation profile.

The second consists of six transversal axes to strengthen education for life, in a human and social way; It will also empower students to manage their own knowledge and education for research in disciplinary training, the use of information and communication technology (ICT) skills and the use of a foreign language.

The curriculum of the Bachelor in Tourism Administration is integrated in the three levels: basic, formative, optional specialization and areas of knowledge in relation to each level; of the 59 subjects contemplated by the EP, 55 (93.22%) are compulsory.

The basic level is intended to establish the theoretical and methodological bases of general and disciplinary training, is composed of 21 compulsory subjects (35.59%).

The Formative level has the purpose of constructing the theoretical-methodological elements that support the professional development of the Graduate in Tourism Administration composed of 41 compulsory subjects (62.5%).

Results

The results of the research carried out from February to May 2016, both documentary and field, were as follows:

After analyzing the curricula of the universities with which the Benemérita Autonomous University of Puebla has an exchange agreement for both students and teachers, there are 16 European universities, 10 South American universities and 10 national universities, as well as curricula Of the Complutense University of Madrid and the University of Cornell in New York, as well as 8 universities whose curricula have been certified by the Ted Qual program of Themis Foundation belonging to the World Tourism Organization.

It is concluded that the program of study does not differ too much from the curricula of these universities, but that if it is necessary to introduce some subjects and expand the contents of others in relation mainly to the use of new operating systems, subjects in English language, Of regional programs, accessible tourism, tourism competitiveness, oral and written communication, reinforce and delimit the areas of research, finance, accounting, entrepreneurship, consulting and law.

In the analysis carried out the majority of these universities present specialization programs mainly in what concerns tourist services and strategic planning, so this supports the project of the new curriculum created, which proposes two specialties with optional subjects that Students can choose according to their preferences or vocation from the seventh and eighth semesters of a total of nine periods.

In order for students to obtain a specialization they must take subjects only from one of these areas of specialization, which will be chosen by themselves, having previously advised by their tutors, having to take a total of 6 subjects in each area, these areas contemplate Compulsory disciplinary subjects (6 subjects) and complementary subjects (4 subjects), the latter may or may not be taken depending on whether the student wishes to continue this specialization.

It should be mentioned that channels of communication, collaboration and feedback should be established among teachers, mainly linking the subjects to develop projects based on sustainable development to bring them to reality and fulfill the commitment that the university has with society.

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It was considered that some of the new subjects to be included in the curriculum are very adequate to the needs of the Regional Units, mainly those of the area of Specialization of Tourism Planning considering the type of students, and options to develop taking into account the idiosyncrasy Of the communities, respecting and adapting to it, although according to their preference and professional development they will be able to choose if they so decided the area of specialization of Tourist Services.

Another point considered was related to the low terminal efficiency of the graduates, the weakness of the area of languages and the subjects related to the investigation, reason for which it was decided to include two subjects imparted completely in the English language, considering that the Starting from the 2015 generation, the students have four levels of English through the General University Training (FGUM) subjects, as well as having three subjects related to research to promote through them a greater terminal efficiency.

Primordially it is necessary to promote the academic mobility of students and teachers, with the purpose of reinforcing the training and updating of the same, which is a reiterated point in all the activities carried out around Curriculum Reform by both teachers and students.

It was suggested that the number of practical hours be increased to 400 so that students can take the knowledge acquired in the classroom and that they define their work profile, considering that some of them get employment in the place where they performed their professional practices, Which included the subject Case study for tourism companies, in which the Social Service and / or Professional Practice can link, making a portfolio of evidence that will allow them to access the degree.

The labor demands in the field of tourism mentioned in the activities carried out within the framework of the Curricular Reform in relation to the competences that the graduates should have are mainly the ability to have communication skills, planning skills, knowledge and business sense, Know how to work a team structure, have tools to know how to make decisions and solve problems and conflicts, have the ability to communicate verbal and non-verbal and oral and written with people inside and outside an organization, plan, organize and prioritize the Work to analyze quantitative data, have technical knowledge related to work, domain of specific software package, know how to generate and / or edit written reports, possibility to sell and influence others, always have a positive attitude, all attitudes, skills And values that are considered to be developed through the subjects included in the new curriculum.

The need to update the current curriculum, including the required subjects and the specialization according to the vocation of each student, is evident so that future generations compete for a changing tourist market, establishing the potential of tourism in our country and which requires Of excellent professionals prepared not only academically but also with values and passion for the service, providing the opportunity and support to students, which will result in greater recognition and prestige at the national and international level.

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An exogeneity analysis for Mexico's foreign trade and economic growth

BALTAZAR-ESCALONA, Juan Carlos*†

UAEM

Abstract

This work is a study of exogeneity between foreign trade and economic growth of Mexico for the quarterly period from 1980 to 2012. Many studies investigating the relationship between trade and growth omit the exogenous behavior of the first to be assumed as endogenous. This paper intends to carry out such tests to elucidate the correct functional form. That is to say determine which variable is exogenous (independent) and which endogenous (dependent). According to the results of exogeneity, it is checked, on the one hand, there is insufficient evidence of compliance with export-led growth approach to Mexico. On the other hand, neither a case of import-led growth is seen. That is, growth induced by foreign trade. Based on the above, exports, obviously, would be behaving as a function of product US and Mexico product. In contrast, imports mainly behave as a function of the foreign product local product. These findings raise the Mexican foreign trade heavily dependent on US product and for the economic growth of Mexico itself and for the period considered this behavior has been maintained and accentuated.

Trade liberalization, foreign trade, economic growth and exogeneity

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* Correspondence to Author (email: cbaltazare@uaemex.mx)

† Researcher contributing first author.

Introduction

Countless researches have centered on analyzing the relationship between foreign trade and economic growth. They have found that growth can be achieved by placing greater emphasis on export growth. However, their results have been limited to analyzing whether they are associated or in which direction they are caused. While these two statistical techniques represent a valid way of analyzing this relationship they do not allow us to clarify how these two variables are impacted. In other cases, it is used as an argument that economic openness leads to the growth of countries by reducing their trade barriers. In this respect, since the investigations were not sufficiently conclusive, there was a strong debate in favor of or against this measure. This process of trade liberalization was driven by the well-known Washington Consensus from the 1990s.

Under the context of the previous process, Mexico used in the early 1980s a profound structural transformation of its economy. This involved, in part, the initial opening of the economy with its entry into the General Agreement on Tariffs and Trade (GATT) in 1986, now the World Trade Organization (WTO); and its consolidation with the entry into force in 1994 of the North American Free Trade Agreement (NAFTA) and that prevails until today. The fact that foreign trade does not affect the growth of the economy has important implications for a country like Mexico that is constantly using its export sector or the gradual reduction of tariff barriers to promote economic growth. The paper is organized as follows: after the introduction, in the second part, a brief empirical review is presented; In the third, the objectives and hypotheses are commented; In the fourth, the Hausman contrast is explained as the methodology used and the model is specified; In the fifth, the results are described.

In the sixth, we discuss the economic implications of the results obtained and in the seventh, we conclude.

An empirical review

In general, the studies that validate the traditional export-led growth hypothesis, as well as those based on the open trade policy, have been carried out without the corresponding exogeneity tests.

Initially, research has included correlation tests such as the classical studies developed by Michaely (1977), Balassa (1978), Tyler (1989) and Kavoussi (1984) and Granger's causality tests (Jung and Marshall, 1985; Chow, 1987; Bahmani-Oskooee et al., 1991). Other studies have focused on measuring the effect of open trade policy on per capita product growth such as cross-sectional models (Sachs and Warner, 1995; Wacziarg and Welch, 2003). In response to the latter, new studies more skeptical, showed that these models present errors in the commercial policy indicators used, as well as conceptual defects (Rodriguez and Rodrik, 2000). The first models, on the one hand, do not establish a functional relationship[1] Or show an ambiguous causality;[2]

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[1] Michaely (1977) finds a high correlation between exports and GDP for a sample of 41 countries in the period 1950-53; Balassa (1978) chooses a sample of 10 countries arriving at the same result that Michaely for the period 1960-73; Tyler (1989) shows this correlation for a sample of 55 middle-income developing countries and 49 non-OPEC developing countries in the period 1960-77; Kavoussi (1984) finds the same when analyzing a heterogeneous sample of 73 countries in the period 1960-78.

[2] Jung and Marshall (1985) finds that of 37 countries under study in only four there is a causal relationship of trade to the product; Chow (1987) finds that of the eight countries that covered his study in six there is a causal relationship in two directions; Bahmani-Oskooee et al. (1991) finds a causal relationship of exports to the product and in other cases in both directions..

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On the other hand, with respect to the latter they may present specification errors or simply omit the problem of endogeneity of foreign trade[3] respectively. In fact, the respondents also do not emphasize this last point.[4]

For this reason, it is imperative that, before making judgments or estimating any regression to measure the effect of foreign trade on economic growth, the exogeneity tests must first be carried out. In this article it is considered that within the foreign trade the commercial opening constitutes a component of public policy.

Objetives and hypotesis

The objectives and hypotheses are explained and described below:

General

Analyze that growth models where the product appears as a function of foreign trade present specification errors.

Where the first concept refers to GDP and the second refers to exports, as well as imports of goods.

Specific

To carry out the corresponding exogeneity tests to show, on the one hand, that both exports and imports present problems of endogeneity in growth models. On the other hand, in these functional relations, validate the exogenous condition of the product (whether local or foreign) to stimulate Mexico's foreign trade.

Hypotesis

The hypotheses to be investigated, according to Hausman's exogeneity tests, can be considered where:

The hypothesis is tested:

Null: The product (local or foreign) is a variable that behaves as endogenous (or dependent) or correlates with the error term.

Against the hypothesis:

Alternative: The product (local or foreign) is a variable that behaves as exogenous (or independent) or is not correlated with the error term.

If one accepts the first hypothesis rejecting the second, it means that economic growth measured by GDP can be induced by foreign trade. That is to say, in this sense, the export-led growth approach or, if applicable, the import-led growth approach would be fulfilled.

On the other hand, if the first hypothesis is rejected by accepting the second, it implies that foreign trade is determined by the product (whether local or foreign). In this case, none of the two approaches mentioned in the previous paragraph would be fulfilled.

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[3] Sachs and Warner (1995) construct a dichotomous opening variable composed of five commercial policy criteria and conclude that the countries with the greatest economic opening tended to grow faster than the most protected during the 1970-1989 period. Wacziarg and Welch (2003) find that the dichotomous variable of Sachs and Warner is sensitive to the 1990-1999 period, concluding that trade liberalization policies increase the degree of openness by positively impacting economic growth.

[4] Rodriguez and Rodrik (2000) perform a reestimation of the cross-sectional models, finding that the different indicators of trade policy are weak indicators or are more related to poor economic performance, suggesting even address protectionism.

Methodology

Time series data are used for exports and imports of goods in aggregate, as well as the GDP of Mexico and the United States deflated by inflation. The observations are quarterly for the period 1980-2012. The methodology used for this analysis of variables is Hausman contrast exogenity tests.

The contrast of Hausman.

In general, the model can be modeled (Hausman, 1978, Engel et al., 1983, Kwan and Kwok, 1995):

$$DY_t = \beta DX_t + z_t\gamma + \varepsilon_t \qquad (1)$$

Where zt is a vector consisting of other variables such as wt and the lagged values of variable X and variable Y. Assuming that there is a series of instruments Zt $\in$ It, including zt, DXt can be estimated as $\hat{\mu}_t = Z_t\hat{\pi}$, that is, From the regression

$$DX_t = Z_t\hat{\pi} + \hat{\mu}_t \qquad (2)$$

By least squares method. Accordingly, if ε and η are jointly homoscedastic (under the null hypothesis of exogeneity), a test for the weak exogeneity of DXt for β is to estimate equation (1) by incorporating $\hat{\mu}_t$ as an additional regressor and then testing its significance. To prove the non-variability of β to changes in DX requires proof of superexogeneity. For this, it must be included $\hat{\mu}_t$ as $\hat{\mu}^2_t$ in equation (1) and prove its overall significance.[5] Taking as a reference the models of trade openness and economic growth, this methodology can be applied by analyzing whether a variable x is exogenous or, if appropriate, endogenous.[6]

This requires the incorporation of one or more additional variables known as instrumental. An instrumental variable z may or may not be highly correlated with this x variable to be tested, but should not be correlated with the error term. For example, be two variables x and y, within which you want to know their exogenous nature of one of the other. In this sense, the following equation is taken as the general model (Pérez, 2006: 424-426)

$$y = \beta_0 + \beta_1 x + u_{t1} \qquad (3)$$

In equation (3) it is assumed that the variable (x) may be correlated with the error term of the dependent variable y, which may be giving rise to an endogeneity problem. The objective is then to test whether x is exogenous or actually endogenous in the equation. For this purpose, an auxiliary regression is first estimated with the purpose of estimating a residual variable as an instrument:

$$x = \alpha_0 + \alpha_1 z_i + \mu_t \qquad (4)$$

Where z is the chosen instrumental variable i. In this sense, the Hausman test7 is equivalent to contrasting the individual significance of (u), which refers to the residuals of the variable x over its instrumental variable used z.[8] To verify the exogeneity of the variable x, we estimate the equation (4). By incorporating the estimated residual variable in equation (3) asinstrumental utilizada z.[8] In order to verify the exogeneity of the variable x, the equation (4) is estimated by incorporating the estimated residual variable in equation (3) as:

$$y = \beta_0 + \beta_1 x + \beta_2 \hat{u} + u_{t2} \qquad (5)$$

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[8] The estimated waste variable can be expressed as:

$$\mu_t = x_t - (\hat{\alpha}_0 + \hat{\alpha}_1 z_t).$$

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If the coefficient of the estimated residuals of equation (5) is statistically significant, the variable x is considered endogenous. Otherwise, exogenous. Therefore, if x does not correlate with the error term, it will be justifiable to estimate this equation by the ordinary least squares (OLS) method. That is, it means that the equation is well specified. If it is correlated with the error term it means that this equation cannot be estimated or is poorly specified. This leads us to argue in particular that in the models of cross-cut growth by openers, one of the assumptions of the classical linear regression model has been overlooked.[9]

According to Kennedy (1997: 58), an important property is that observations of the independent variable must be considered fixed in repeated samples.10 that is, the sample can be repeated with the same independent variables.

The formulation of a model of simultaneous equations would constitute a violation of this assumption. This means that there can be no dual functionality between foreign trade and growth. In this sense, the most probable analysis is the uniecuacionales and time series models, using the methodology of Box-Jenkins.[11]

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[9] These models refer to the per capita product as a function of different opening trade policy indicators and in some cases the least squares methodology is used in two stages with instrumental variables to soften the problem of endogeneity and without correcting it..

[11] According to the Box-Jenkins methodology, in time series models, a variable such as Yt can be explained by its past or lagged values, and stochastic error terms. According to this specification, the ARIMA models are also called aortic models because they are not derived from any economic theory. While the models of simultaneous equations are based on economic theories (Gujarati, 2003: 811).

Model

The objective of using an instrumental variable is not to assume the exogenous role of foreign trade as argued in the previous studies since it is assumed endogenous. That is, to demonstrate that a model of product growth in terms of exports or total imports is incorrectly specified. For this, the equation of exports, as well as of imports, is analyzed by analyzing the exogeneity of the product. In fact, a variable that is not related to the previous variables is used as instrumental variable. That is, a totally arbitrary variable is chosen in the case of Mexico and the United States as the variable that fulfills this condition. Based on equation (4), the residual variable is estimated from GDP (local and foreign) as a function of the instrumental variable (z):[12]

$$PIB = \beta_0 + \beta_1 z + \mu_{1t} \qquad (6)$$

In order to verify the exogeneity of this GDP, it is estimated, on the one hand, the total exports equation (XT), incorporating the previously estimated residual variable:

$$XT = \beta_0 + \beta_1 PIB + \beta_2 \hat{\mu} + \mu_{2t} \qquad (7)$$

On the other hand, the total imports (MT):

$$MT = \beta_0 + \beta_1 PIB + \beta_2 \hat{\mu} + \mu_{2t} \qquad (8)$$

Kwan and Kwok (1995) test the weak exogeneity and superexhaustion of exports for the case study of China. They determine the optimal number of lags for the growth rate of output and exports.

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[12] In the estimation of the residual variable of equation (4) one can use the own lagged value of GDP as part of the instrumental variable z as independent variables.

In this case, they estimate the growth rate of the product as a function of one, two and three lags of the product itself and the growth of exports, as well as the estimated residual variable. They also include the growth rate of the labor force and investment as a proportion of GDP. All its variables are taken in first differences.

Results

Following the described procedure, the exogeneity tests were applied for a period of more than three decades of commercial opening to analyze how these variables have been related in this period. All economic variables were adjusted for inflation. These were estimated in logarithms and first differences to avoid problems of stationarity. The value of the t statistic is in parentheses. The significance is: () ***, 99%; () **, 95%; () *, 90%. The abbreviations n. S. Are not statistically significant.

It begins by reporting the results regarding the analysis of exogeneity of the product of Mexico and later of the product of the United States with respect to exports.

Exports

The following equation tests the exogenous role of the local product in relation to exports:

$$\Box \log(XT) = 0.02 + 0.84 \Box \log(PIB) - 2.09E - 06\hat{\mu} \qquad (9)$$

(1.85)* (3.57)*** (- 0.55) n. s.
$R^2 = 0.11$ D. W. = 2.28 n = 1980:2 – 2012:4

In contrast to equation (9), in (10) the exogenous role of the foreign product is tested:

$$\Box \log(XT) = 0.002 + 3.07 \Box \log(GDP) - 9.74E - 05\hat{\mu} \qquad (10)$$

(0.14) n. s. (2.08)*** (- 0.17) n. s

$R^2 = 0.04$ D. W. = 2.48 n = 1980:2 – 2012:4

Equation 9 was estimated considering the constant, the GDP of Mexico that is the variable to be tested and the residue variable that contains the arbitrary instrumental variable. As can be seen the coefficient of the residue variable is practically zero and statistically not significant (0.58). This result, according to Hausman's evidence, would indicate that Mexico's GDP is exogenous. That is, in another sense, it means that it cannot be specified as a dependent in terms of exports.

However, the dispersion graph 1 shows that while exports and GDP appear highly correlated, their effect on the former can be weak to stimulate sales abroad. These goods are mainly concentrated in: manufacturing exports; Agriculture, forestry and fisheries; and extractive. From Graph 1, between the two variables, there is not an approximately linear relationship, especially in the early years of the 1980s. This means that for each percentage increase in GDP, in those years, there is no significant positive effect on export growth. This behavior can be modeled using dichotomous variables identifying the years to capture structural changes
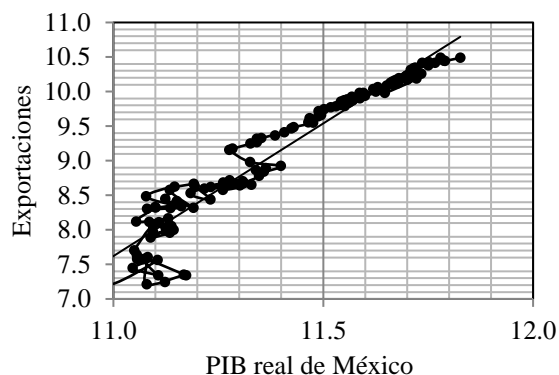
Graphic 1 Mexico. Exports and local product (1980: 1-2012: 4) *Source: Estimate based on INEGI*

Kwan and Kwok (1995), for example, arrive at a different result when analyzing the case of China for the period 1952-1985. Applying evidence of weak exogeneity and superexogeneity, in Engel and Hendry's sense, they find that exports are exogenous in their growth equation, thus validating the export-led growth hypothesis. In contrast, Blanco (1994) and Aspe (2005) emphasized that the best way for a country like Mexico to resume its growth - making it more attractive abroad and achieving its economic efficiency - was through the outward-oriented development model through openness commercial.

Other authors such as Tornell et al. (2004) considered that GDP growth could have been lower without trade liberalization. Kose et al. (2004) state that while the growth of the country's economy declined, it did better after pre-NAFTA. Even the United States Congress (2003) argues that the increase of Mexican exports to the United States contributed to the increase in Mexico's GDP.13 the common denominator of this literature is to argue that exports have an impact on the local product omitting the endogenous problem of exports as can be seen from Graphic 1.

The result from equation (8) shows that the coefficient of the residual variable is practically zero and statistically non-significant (0.86). This result indicates that foreign GDP is exogenous.

That is, the foreign product performs as an exogenous or independent variable with respect to Mexico's exports. In this regard Blecker (1996) considered that in the absence of an internal stimulus to grow, Mexico, sought the promotion of exports. Nevertheless, it indicated that these cannot serve as motor of growth, in the meanwhile, the exchange policy operates with opposite purposes.

He points out that with the devaluation, while stimulating exports and allowing an improvement in the trade balance, it is not possible to promote a rapid expansion of the economy, or to operate export-led growth. Weisbrot et al. (2004) in replicating a study carried out by the World Bank show that NAFTA rather reduced Mexico's economic growth. According to this body, NAFTA increased per capita output in Mexico by four percent at the end of 2002. For the authors, this was one percent.14

From the results of equation (10) and the scatter plot 2 it can be seen that exports and GDP of the United States are highly correlated, approximately, linearly. In contrast to the graph (7), a strong dynamic effect is observed here that foreign product exerts to stimulate foreign sales, particularly of manufacturing goods. In economic terms, it means that for each percentage increase in foreign GDP, exports will increase more than proportionally. Conversely, this behavior shows that, in the face of a contraction of this product, exports are contracted procyclically.
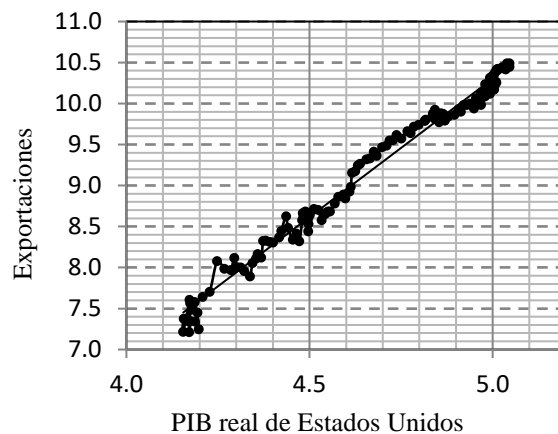
Graphic 2 Mexico. Exports and foreign product (1980:1-2012:4) *Source: Estimate based on INEGI and Bureau of Economic Analysis*

Imports

When analyzing the role of the product in Mexico's total imports, it is certainly expected to confirm its exogenous relevance as an important determinant of import goods. However, the results found lead to a very different interpretation. This means that it can lead to a significant re-specification of the import function by the way it is traditionally defined.

The study also requires testing the exogenous role of the local product:

$$\Box \log(MT) = 0.01 + 1.15 \Box \log(PIB) - 1.4E - 06 \, \overset{\wedge}{\mu} \qquad (11)$$
(0.92) n. s. (4.43)***   (- 0.35) n. s.
$R^2 = 0.16$ D. W. $= 1.57$ n $= 1980{:}2 - 2012{:}4$

Finally, the exogenous role of foreign product in imports is tested:

$$\Box \log(MT) = -0.002 + 2.70 \Box \log(GDP) - 0.002 \, \overset{\wedge}{\mu} \qquad (12)$$
(- 0.11) n. s. (1.61) n. s. (0.33) n. s.
$R^2 = 0.03$ D. W. $= 1.96$ n $= 1980{:}2 - 2012{:}4$

In equation 11 where the GDP of Mexico is tested, the coefficient of the residuals is zero and statistically non-significant (0.73). This result would indicate that the GDP is exogenous. That is, according to this, it has an effect on imports. When performing other tests a variation in the significance of the coefficient of the residues is observed. The Wald test shows this situation. In this case, since the critical value of the F test is slightly greater than the test statistic, with a significance level of 99%, Mexico's GDP is not exogenous.15 According to this it would indicate that it is dependent or endogenous. Despite this finding cannot be considered the existence of a case of import-led growth.16 That is, import-induced growth.

As evidence of the above, it can be seen from the scatter plot 3 that the correlation between imports and GDP in Mexico is not approximately linear but rather is a ratio in parabolic form. This finding may be indicating the weak role of the local product to stimulate external purchases. These are classified as intermediate consumption goods, capital goods and final consumer goods. The shape of Figure 3 shows that despite a larger percentage increase in local output, the effect on imports growth is relatively low.
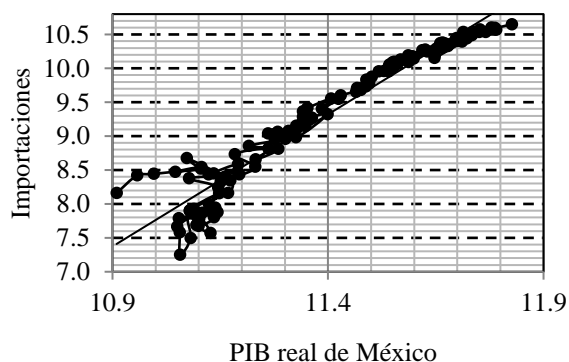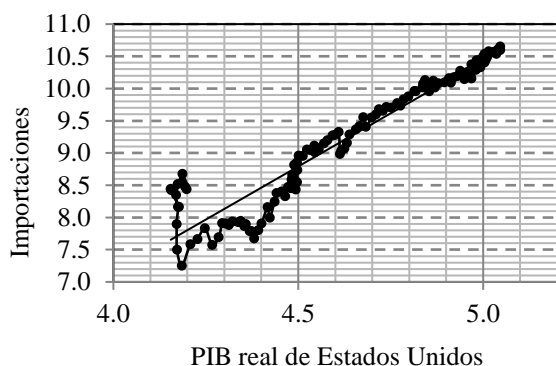

Graphic 3 Mexico. Imports and local product (1980: 1-2012: 4) *Source: Estimate based on INEGI*

The study by Bosworth et al. (1993) points out that GDP may be related to a larger amount of imports through a greater inflow of capital goods, for a country like Mexico. The analysis of causality of Cuadros (2000) of the impact of the commercial opening in Mexico in the period 1983-1997 seems to indicate this situation. First, it does not find a causal relationship between exports and output. Second, the growth of aggregate output is caused by the growth of total imports.17 Tables show that although trade liberalization influenced the product, it did so through imports, constituting itself as a determinant of economic growth. This result of Tables, not being based on impact coefficients, can hardly be considered as a case of growth induced by imports.

Pacheco López (2005) suggests the same situation. That is, Mexico faces an external restriction on growth. This is due to the fact that the income elasticity of the demand for imports tends to grow faster than the income elasticity of demand for exports tends to grow. According to the foregoing, this situation was further accentuated by the entry into force of NAFTA. The result obtained by equation (11) where the United States GDP is tested, it can be seen that the coefficient of residues is zero and statistically non-significant (0.38). This result confirms the exogeneity of foreign GDP. This means that unlike the previous result, Mexico's imports as an endogenous variable are rather determined by foreign GDP as an independent variable.

Scatter plot 4 shows that the foreign product itself plays a fundamental role in stimulating Mexico's own imports. According to this graph, for each percentage increase in the foreign product, external purchases will increase more than proportionally. This means that Mexican imports are compromised by a contraction of US economic activity, unlike what happens in Graphic 3.

Graphic 4 Mexico. Imports and foreign product (1980: 1-2012: 4) *Source: Estimate based on INEGI and Bureau of Economic Analysis*

In this regard, Lederman et al. (2005) find convergence between the US and Mexico economies, which is favored by NAFTA. Estimating a structural model of time series for the period 1961: 4-2002: 4, according to its results, non-unilateral trade liberalization had a significant positive impact on the speed of convergence. However, the estimated coefficients for each of its dichotomies of both unilateral and non-unilateral trade liberalization in Mexico are all coefficients close to zero. These coefficients emphasize that they may be showing strong problems of endogeneity.

Economic implications of the results obtained

Using the exogeneity analysis to determine the role of GDP in relation to foreign trade has important economic implications for an economy such as Mexico. That is, by the way their export and import functions should be defined. The results presented in equations (9) and (10) of the previous section show, on the one hand, that Mexican exports act according to the local product as well as the foreign product. By focusing solely on the product, it would be incorrect to specify them only in terms of the foreign product as traditionally assumed (Peñaloza, 1988; Tapia and Cervantes, 1988). Firstly because they are specified according to the foreign product; Or as a function of the local product. On the other hand, contrary to the expected logic, Mexican imports are manifested as a function of foreign product. This leaves between said that would occur with the local product if it restrained imports. Some studies have traditionally specified imports as a function of local GDP (Galindo and Cardero, 1999; Moreno Brid, 2002). Even using industrial indices, as in the study of Garcés (2008) does not include the index of local industrial production in the export function; while in this same study, imports are specified as a function of the local production index.

Article

The analysis of exclusion and weak exogeneity of Garces does not allow to determine the exogenous or endogenous role of these indices. According to the exogeneity tests, the resulting functional relationships would be as follows:

$$X_t = f(\overset{+}{PIB}, \overset{+}{GDP}) \qquad (13)$$

$$M_t = f(\overset{+}{GDP}) \qquad (14)$$

Where X and M are total exports and imports of goods; GDP and GDP are the local product (Mexico) and foreign (United States) respectively.

From functions 13 and 14, the growth of foreign economic activity would be expected to stimulate growth not only of exports but of total imports. In this sense, with the increase in imports, an increase in local economic activity would be expected, creating a positive feedback effect on Mexican exports.

The above results can be contrasted with the tests of causality in the contrast of Granger (1969). The test was performed with the variables in logarithms and in first differences including up to a maximum of four lags:

$$X_t = \sum_{i=1}^{4} \delta_i PIB_{t-i} + \sum_{i=1}^{4} \lambda_i X_{t-j} + \varepsilon_{2t} \qquad (15)$$

$$X_t = \sum_{i=1}^{4} \alpha_i GDP_{t-i} + \sum_{i=1}^{4} \beta_i X_{t-j} + \varepsilon_{1t} \qquad (16)$$

$$M_t = \sum_{i=1}^{4} \delta_i PIB_{t-i} + \sum_{i=1}^{4} \lambda_i M_{t-j} + \varepsilon_{2t} \qquad (17)$$

$$M_t = \sum_{i=1}^{4} \delta_i GDP_{t-i} + \sum_{i=1}^{4} \lambda_i M_{t-j} + \varepsilon_{2t} \qquad (18)$$

$$PIB_t = \sum_{i=1}^{4} \delta_i GDP_{t-i} + \sum_{i=1}^{4} \lambda_i PIB_{t-j} + \varepsilon_{2t} \qquad (19)$$

The results of the causality tests are shown in Table 1:

Variables		Dirección de causalidad		
		Rezagos incluidos		
		2	3	4
1	X vs. PIB	PIB→X	PIB→X	No hay causalidad
2	X vs. GDP	GDP→X	GDP→X	GDP→X
3	M vs. PIB	M→PIB	M→PIB	M→PIB
4	M vs. GDP	GDP→M	GDP→M	GDP→M
5	PIB vs. GDP	No hay causalidad	GDP→PIB	GDP→PIB

Table 1 Granger causality tests *Source: Own estimate based on information from INEGI and Bureau of Economic Analysis*

Table 1 shows, on the one hand, that exports are caused by GDP with two and three lag periods. In contrast, with all lags including exports are always caused by US GDP. On the other hand, contrary to expectations, it was found that Mexico's GDP is caused by imports up to four lagged periods. Contrary to the previous result, imports are rather caused by US GDP with two, three and four lags. An end result allows to verify that the local product is caused by the foreign product with three and four lags.

According to these causality tests, the foreign product could be impacting on the local product through its connection with the total imports. Under this logic, the above would be proposing the following functional relations and that would have important economic implications for Mexico:

$$PIB_t = f(\overset{+}{M}) \qquad (20)$$

However, due to the functional relationship 14 where imports from Mexico are mainly determined by the foreign product, which is the same result as the causality tests, the functional relationship:

$$PIB_t = f(\overset{+}{GDP}) \qquad (21)$$

Where the local product is determined by the foreign product.

Conclusions

Evidence of exogeneity showed that economic growth in terms of GDP cannot be induced by foreign trade. That is, the export-led growth approach to Mexico does not operate. The assumption that it is met raises specification errors.

This argument can be an important indication of the zero incidence of the policy of trade opening in Mexican economic growth. Since both exports and imports are endogenous, while the product is exogenous. In this sense, exports are specified as a function of the local product, on the one hand, and of the foreign product, on the other.

On the other hand, an important specification derived from the analysis of exogeneity is that imports are not determined by the local product as traditionally assumed. These are determined primarily by the foreign product.

In relation to these results the GDP of Mexico may be an import-dependent variable. This is due to the need for intermediate goods and capital to stimulate growth. The foregoing shows a sharp fall in the Mexican economy when its external purchases are slowed due to devaluation or a contraction of the economic activity of its main trading partner.

Appendix

A. The variables used were taken from the following sources:

México INEGI (www.inegi.org.mx)

PIB en miles de pesos a precios corrientes

Índice de precios implícitos del PIB (2008 = 100)

Exportaciones totales en miles de pesos a precios corrientes

Índice de precios implícitos de las exportaciones totales (2008 = 100)

Importaciones totales en miles de pesos a precios corrientes

Índice de precios implícitos de las importaciones totales (2008 = 100)

Variable instrumental utilizada. Servicio Meteorológico Nacional. Comisión Nacional del Agua (www.smn.cna.gob.mx) Temperatura promedio en grados C° (1980:01 - 2006:12).

Banco de México (www.banxico.org.mx)
Tipo de cambio promedio del periodo (1980:01-2006:12)

FMI
International financial Statistics (www.imfstatistics.org)

Índice de precios al por mayor para México (2000=100). Se utiliza como una aproximación del índice de precios al productor.

United States Bureau of Economic Analysis (www.bea.gov)

PIB de Estados Unidos en billones de dólares corrientes Deflactor de precios implícitos del PIB (2000 = 100)

National Climatic Data Center (www.ncdc.noaa.gov)

Temperatura promedio en grados F (1980:01-2006:12).

B. La prueba de Wald se aplicó a partir de la siguiente formulación:

$$F_{calculado} = \left(\frac{SCR^R - SCR^{NR}}{SCR^{NR}} \right) \left(\frac{n-k}{q} \right)$$

donde SCR^R es la suma de cuadrados de los residuos del modelo restringido y SCR^{NR} del no restringido; n es el número de observaciones totales; k el número de regresores; y q el número de restricciones. Asimismo se requiere el valor crítico de la distribución $F_{\alpha(q, n-k)}$. El criterio que se sigue es si el $F_{calculado} > F_{\alpha (q, n-k)}$ se rechaza la hipótesis nula, pero si el $F_{\alpha (q, n-k)} > F_{calculado}$ se acepta la hipótesis nula.

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(1)

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Author	Distinctive competencies in the area of operations					Types of companies	Country
	1	2	3	4	5		
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Avella Camarero, Fernández Sánchez, y Vázquez Ordás (1999, p. 241)	Cost	Flexibility	Quality	Delivery	-	Industrial companies with more than 200 Job.	Spain
Zhao et al. (2002, p. 278)	Quality	Delivery	Service	Innovation	Flexibility	Moldings and machinery	China
Ahmad y Schroeder (2002, p. 80)	Quality	Delivery	Efficiency	Innovation	-	Cars, electronics and machinery	Germany, Italy, Japan, USA
Boyer y Lewis (2002, p. 14)	Cost	Quality	Delivery	Flexibility	-	Advanced factories AMT	USA
Sarache Castro et al. (2004, p. 42)	Price	Quality	Speed	Flexibility	technical assistance	Clothing industries	Colombia
Urgal González y García Vázquez (2005, p. 109)	Price	Flexibility of product and volume	Delivery	Design quality	Quality compliance	Metal industry, with more than 50 workers	Spain
Urgal González y García Vázquez (2006, p. 139)	Price	Quality	Deadline	Flexibility	Service	metal Sector	Spain

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