The key factors to develop competitiveness

The key factors to develop competitiveness

José Sánchez Gutiérrez
Juan Antonio Vargas Barraza
Juan Mejía Trejo
Guillermo Vázquez Ávila
Juan Gaytán Cortés
(*Coordinators*)

Primera edición, 2013

Av. Periférico Norte 799, Edificio G-306
Núcleo Los Belenes
Zapopan, Jalisco
45100, México
Tel-fax: +52 (33) 3770 3343 ext. 25608.

ISBN: 978-607-9147-78-5

Impreso y hecho en México
Printed and made in Mexico

Contenido

II. Competitiveness and financial performance

Introduction

As the world is becoming one big market the traditional powers are facing bigger challenges as new emerging powers rise, this book shows how this new economies are facing the troubles that global competition represents. Our first article contextualizes how the Mexican corrugated cardboard industry may prevent financial crisis haven the right indicators to be measure and to improve the competitiveness of their economic sector.

It's a fact that to keep competitiveness has become a challenge for countries and companies, but little is known about what Business Competitiveness is, and which factors are affecting it. The second work presented in this book talks about it. One key element for competitiveness is intellectual capital, and the third work presents a way to determine it, using two of the main companies: Televisa, the largest Mexican media company, and Wal-Mart, measuring external intangible liabilities and describing how information affects the value of shares.

New technologies are opening new market opportunities and demolishing geographical barriers, and national governments are also starting to use it. The fourth work talks about the performance of Mexican Websites in order to promote Mexico as a tourist destination. To evaluate the customer satisfaction in services is also a key element for tourism and competitiveness, and the fifth work proposes a model for measure the customer satisfaction in Guadalajara's restaurant industry.

As emerging markets are growing, also their population is increasing their purchasing power, but also their expenditures are getting higher. The six paper analyzes the architecture of finances in Mérida, Yucatan, as a need to share the knowledge of how to manage personal finances.

To have a successful quality model is necessary to find which elements should be included in a study, in that way any company could have a road map of what to review to improve their quality. This is presented in the seventh work, a success factors or a quality model award.

Searching about which factors are important for competitiveness, the eighth paper presented in this book shows how the exchange impact in the trade balance and the level of economy, focusing in the periods of 1991 to 2012 in Mexico. Keeping the same axis, the final paper talks about how the financial decisions are made under uncertainty conditions, comparing the data with information that may be considered perfect.

Dr. José Sánchez Gutiérrez

I
Globalization, education and technology

1
The financial architecture of corrugated cardboard companies in Mexico and the contribution of IHE's to the competitiveness of the sector

Manuel Antonio Yarto Chávez[1]
Manuela Badillo Gaona[2]
Claudia Flores Cervantes[1]

Abstract

This documentary research contextualizes and provides elements to determine if the corrugated cardboard industry have measures to prevent financial crises, this means, if they have indicators that allow them to have a financial architecture and a better management through the recruitment of qualified personnel such as graduates of the educational proposal and thereby improve the competitiveness of the economic sector that they belong. Through a qualitative and an exploratory analysis, it is illustrated some data of the economy and the sector under study, and it is inferred through observed experiences of some companies an establishment of an understanding of its performance. It presents a discussion of the performance of the corrugator sector in the national economy and

1. Centro de Investigaciones Económicas Administrativas y Sociales- Instituto Politécnico Nacional
2. Escuela Superior de Comercio y Administración. Unidad Santo Tomás- Instituto Politécnico Nacional

the contribution of graduates of higher education institutions and the academic connection. Finally, through inquiries it is conjectured that the participation of both sectors does not have dynamism of cooperation, at least for the moment.

Keywords: Financial architecture, competitiveness, economic growth, learning culture, innovation, institutions of higher education (IHE).

Introduction

The emergence of global imbalances and the consequent economic crisis are symptoms of first order of the incoherence of the financial system. Hence the need for the concept of financial architecture, since the factors of the reconstruction and reform of the global financial system are essential principles to have a consistency of investment by each country, which are imperatives for poverty reduction.

By reforming global rules in order to restore the capacity of public authorities, both global and national levels to reduce excessive risk in the private sector, and ensuring that finance will serve to the real sector, is an urgent priority. Since the national authorities of each country are the first line of defense against the volatility of the financial markets, their capabilities to control volatile capital flows, must be supported by international institutions (*World Economic and Social Survey* 2010).

Companies generate regulatory reforms to cope with financial problems. That is, to create the financial architecture, not only to reduce the cost of a potential crisis, but to minimize the possibility of a crisis itself. The financial architecture is therefore a set of measures that can help prevent crises for a better management and for a more integrated financial environment.

In that regard, the recommendations of Governments of central banks of the Group of the Twenties to minimize the possibility of a global financial crisis are among others strengthen capital, reduce leverage and increase transparency (Ledo, 2010). These concepts apply to international levels, and are extrapolated to enterprises, since it has been observed that large companies succumb to disasters if they are not well supported in their internal processes. But these internal processes in the companies make improvements in its financial results and generally they have graduates from the educational offer of the market.

Proposal

Based on empirical experience in different companies of corrugated cardboard, it has been observed the performance of these organizations and the behavior of key people who some of them have academic preparation (graduated from IHE's); in such a way that will allow them to make decisions from their perspective. However, there are others who occupied equivalent positions in some other companies but who do not have an academic degree. In any case, when they make decisions to achieve certain results in order to have a better organizational performance, there is dissociation with the financial aspects of the business, and it is perceives a weak financial architecture. This is associated with financial indicators such as sales, profit margin, value of assets, stockholders ' equity, total assets, as well as the financial ratios of liquidity, debt, and market value; all of these represent the performance of the companies that contribute to the gross domestic product (GDP) of a country.

The presumption of this situation is that apparently do not consider strategies that can prevent crises to have a better management and to be a more integrated financial environment. The information obtained from the cardboard sector has been through participating observations (Padua, 2004) for a period of ten years, and this qualitative study allows knowing more the action of these companies and therefore their performance in terms of financial growth.

Pursuant to the above, and within the perspective of the context of the companies in the corrugated sector in Mexico, the business figures which can hold out the financial architecture are unknown, but it can be seen that generally the cardboard companies pass by certain difficulties, in the operational, strategic and financial aspects. In addition, routinely graduates of the education sector, who are part of the staff, are supporters in decision-making; thus, they impact the financial figures and, they might contribute with greater financial strength to the companies. As a result, it arises the question to the research problem: how graduates (from IHE's) contribute to decision-making so that companies of corrugated cardboard in Mexico may have a better management and an integrated financial environment, and thus become more competitive?.

General objective

To analyze the way in which graduates of IHE's contribute to decision-making so that companies of corrugated cardboard in Mexico, have a better management and an integrated financial environment, and thus become more competitive.

Methodological foundation

In this research, the analysis is exploratory because it allows knowing the contribution of graduates in a particular sector such as the cardboard enterprises, which is a matter that has not been addressed previously. However, by empirical experience, it is known the problems and the conditions that have many of the companies (Yarto, 2010) with difficulties in common. Additionally, we have had some interaction with about 35% of the total of 129 companies (see attachment - location of the cardboard companies), hence it has also allowed the interaction with key personnel, so that *opportunity samples*, *extremely important cases for the analyzed problem* and *convenience samples* are presented for this research. In addition, *qualitative observations* have been made for having participated directly in some companies (Hernández et al., 2006).

The approach of this study is qualitative and inductive as general data are presented from 1999 until 2011 for sizing the problem of study (Hernández et al., 2006). Qualitative research allows knowing among others: businesses behaviors, characteristics of decision-making, the profile of the staff and how to face the challenges of the environment.

Once the operationalization of category and subcategories analysis is made, it sets the following:

- the *performance of the companies of corrugated board*
  - through its financial indicators for example the level of sales, the profit margin, the value of the assets, stockholders, total assets, as well as the financial ratios such as liquidity, debt, and the market value;
  - all of these represent the development of companies that contribute to the economic growth of the GDP.
- Graduates of institutions of higher education,
  - with their academic training, they work in companies of corrugated cardboard and

- they take decisions that may contribute to the growth of enterprises which translates into strategies to prevent financial crises.

This research describes the phases of information in order to achieve the (conceptual, exploratory and inductive) analysis. To do this, it is presented a biblio-hemerographic review and queries on the network for the creation of a theoretical framework, and based on the empirical experience of the object under study; it is also analyzed and interpreted certain trends in the sector.

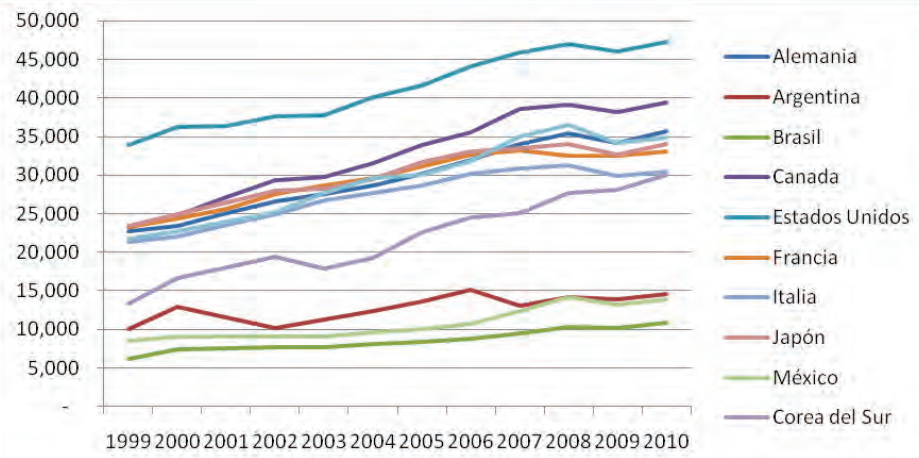
Global perspective

If we consider the GDP of countries, as an indicator of the sum of the performance of the companies (the value of all the final goods and services produced within a nation in a given year), may wonder about the financial architecture which countries possess of a higher value since they can be considered with greater strength to deal with potential crises. Since then, irregularities have been occurred in certain organizations as those presented in recent years in the United States and Europe, but definitely some economies of such countries have more solidity than Mexico.

Figure 1 shows the per capita GDP (this variable indicates the GDP divided by the population purchasing power parity) of some countries selected for the analysis. They are all members of the Group of the Seven: Germany, Canada, United States, France, Italy, Japan and the United Kingdom. In addition, some competitive economies in the Americas compared to Mexico are included such as Argentina and Brazil. Moreover, it is South Korea, because is a country that has been economically highlighted recently and whose quality was lower in the seventies than Mexico. Now it is presented an opposite condition.

Also, it is shown in Figure 1, a twelve year period, from 1999 to 2010. United States is very above than all countries, Canada which started equal compared to others in the same period, occupies the second position. It is followed by Japan with the third position. The following places; from the fourth to the seventh belongs to the Group of the Seven: Germany, United Kingdom, Japan, France and Italy, respectively. In the eighth place is South Korea, which in 1999 began with 62% of the per capita GDP value of Italy, ended in 2010 very close to the figure of that country. South Korea is also the country that has proportionally grown more than the rest of them.

Figure 1
Per capita GDP (US$)



Source: Own elaboration with data: http://www.indexmundi.com/g/g.aspx?v=65&c=us&l=es retrieved August 23, 2012.

In the ninth place follows Argentina, in the tenth Mexico and finally the eleventh in this list is Brazil. If the sum of economic activity is reflected in the GDP of each nation, it can be inferred that the economic sectors (primary, secondary and tertiary) as a whole are proportionally reflected by the strength of their organizations; and particularly, in the secondary sector where the manufacturing companies belong, all of which contribute to the growth of this indicator.

During 2012 *The Global Fortune 500*, encompasses 334 companies from the countries mentioned above, this represents 67% of the total number of the most important firms in the world. The United States leads the list with 132, follows Japan with 68, Germany and France with 32 companies each, United Kingdom with 26, South Korea 13, and Canada and Italy with 11 and nine, respectively. Regarding the countries of Latin America, Brazil has eight companies while Argentina none. It should be noted that in the list is China with 73 (already occupying the second place overall, previously this country was not participating in such a list) and Switzerland with 15 companies in the global top. Mexico is on the list with only three companies: Pemex in place 34, America Movil in 176 and CFE in the 470. If removing the two government corporations,

it remains the second as a private company but it is not included in the manufacturing sector.

(http://todaynewsgazette.com/fortune-global-500-2012/, and http://money.cnn.com/magazines/fortune/global500/2012/countries/Australia.html?iid=top3).

The criteria to be followed for highlighting the companies is generally the level of sales, the profit margin, assets, stockholders equity, total assets and number of employees. Also, the strength of these companies is reflected by the levels of profits as a percentage of sales and as a percentage of the fixed assets.

There are several questions in this regard in order to understand what other more competitive economies with respect to Mexico are doing, and therefore the performance of their respective companies. More importantly, South Korea must have made some actions since it has an amazing growth because in 1999, its per capita GDP was away 61% to the Italy (this country has the per capita GDP lower from the Group of the Seven), but in 2010 reach the same level of performance as compared to Italy. With that same comparison, Mexico was away in 1999 from Italy by 152%, and despite the progress that has taken in 2010, is still distant 119%, which implies that Mexico does not have the same rhythm as other economies.

Among the countries surveyed are two of the Asia-Pacific region; they are Japan and South Korea. Mexico has a great business opportunity with these countries because of their progress in trade negotiations; however, it is necessary to recognize that Mexico is highly dependent from the United States market, (Romero, 2011). In that sense, the improvement of the countries of East Asia reflects that their Governments have not only had high autonomy and capacity to promote economic development through industrial policies, but also having a society based on rules (Wang, 2011). In addition, it is well known that South Korea has had a good performance in their educational levels, and half of its population in the labor market country boasts a tertiary education, i.e. equivalent to the high school level, while Mexico around 75% of workers has only primary school (Trotsenburg on *Perspectivas del Banco Mundial en Educación* in Villa and Nunez, Coordinators, 2009).

The approach of an organization should not be seeking protection against possible risks, but to deal with the business nature itself to be more competitive in the global environment. This is to say, they should focus in the business, rather than worry about the environment. In general, companies are continually trying to expand their efforts marketers

to achieve new sales opportunities (Dwyer et al., 2005), but this requires that the enterprise will have convincing results, and these translate to deliver products as requested by them in time and manner, including, quality, cost and delivery time.

In that sense, good companies make market innovations which facilitate economic growth and employment that impact on people's lives. Therefore, the main goal of innovative business is to develop new products that have benefits to society, as the steady economic growth through innovation plays an important role in the increase of per capita income. Small changes in economic growth can have large differences in income across time (Ahlstrom, 2010).

In addition, companies with growth can easily recruit the best people, but when sales decrease, employees can detect that their possibilities to advance are restricted, not by their talent and performance, but by the number of years that must pass to gain a better position before retirement. When this happens, many of the most capable employees tend to leave the company, negatively affecting the organization skills to generate growth (Ahlstrom, 2010).

In organizations, however, there should be a *learningculture*, which is a term to promote a positive and active disposition toward learning in either society or organizations, focusing on helping people to develop the habit of learning throughout their lives. The most effective way of improving this, is changing the learning culture (Kukulska-Hulme, 2010).

But such learning culture is generated by firms, and can attract people who are available in the labor market, and if the organization intends to generate economic growth (through innovations, or well, at least just survive), then they have to attract graduated staff with some academic degree from any University.

With regard to universities is convenient to revise their curricula program since they must play a role of integration into society considering their needs, so that it can be formulated the following questions: what is expected of graduates?, what competencies or skills are obtained from the graduate institution of higher education for effective performance in organizations?

In a study of nearly 200 schools in the United Kingdom (UK), it was developed a program called *Opening Minds* in response to which the young people were being educated in a way that reflects a growing separation of the needs as citizens of the 21st century, and a set of five competencies were developed: commitment to citizenship, learning (learning to

learn – active, analytical, inquisitive, producer of knowledge), information management (capable of communicating across boundaries of language and culture), situations (applying independent critical judgment, developing ability to operate effectively with the real world), and management related to people (motivated and empowered to learn continuously throughout life). (Kukulska-Hulme, 2010).

In UK, the international experience in developing undergraduate students is to perform **research and consultation**, establishing that the goal is to switch over to the curricular area in the direction of developing students as participants in these activities, so that they will be producers, and not only consumers of knowledge (Jenkins & Healey, 2009).

Palöjarvi in *Calidad de la Educación en Finlandia* (Villa and Núñez, Coordinators, 2009) notes that in Finland is very clear the importance of how human capital and education are parts of the economic success, and these could be factors that are influencing why it is above Mexico more than 150% in its per capita GDP, not to mention that educational unions are more professional focused rather than policy oriented.

The development of a country is the sum of the productive sectors, and in particular the contribution which may have the companies in the manufacturing sector, because they capture trained staff that supports them in the decision-making process so that they may have a good financial performance and hence could be protected from crises, this means to present a competent financial architecture; in this study, we exclusively look companies of corrugated cardboard in Mexico.

The manufacturing sector and enterprises of cardboard in Mexico

The production is the heart of the industry, and this is the heart of a healthy nation (Goldratt, 2003). Productivity is a key for modernization and industries must be pushed to the improvement. Mexico requires in all sectors to raise awareness of the need for a national culture of productivity.

The gap that distinguished the industrialized and the developing countries becomes large. If there is not a break from the underdeveloped countries of that trend, prosperity will depend increasingly from countries that are really betting the genuine improvement, innovation and creativity because they have advances in technology with best practices to be more productive.

A similar situation happens within the industrial sectors in the same country. There are industries that have implemented modern technologies featuring his performance unlike others. They create an organizational culture and generate world-class competitiveness, improving their productivity.

However, there are several industrial segments that have not penetrated the improvement conditions, or at least, at the same pace as others. This study noted the corrugated packaging industry to analyze the structural and cyclical conditions and so appreciate the productivity in this sector. The corrugated industry reflects the level of activity of a country since almost all products depend on packaging and transporting their merchandises and, therefore, it can be inferred the economic development of the nation.

The growth of Mexico in the period from 2003 to 2010, grew 17.3% (based on the GDP as indicator), while registered a sharp drop of 6% in 2009 generated by the international crisis and Mexico was no exception. However, the manufacturing industry grew 14.0%, lower than the national level and also suffered a strong fall of 9.9% in 2009 but it recovered in the following year (Table 1).

Table1
GDP in Mexico.
(Millions of pesos at 2003 prices)

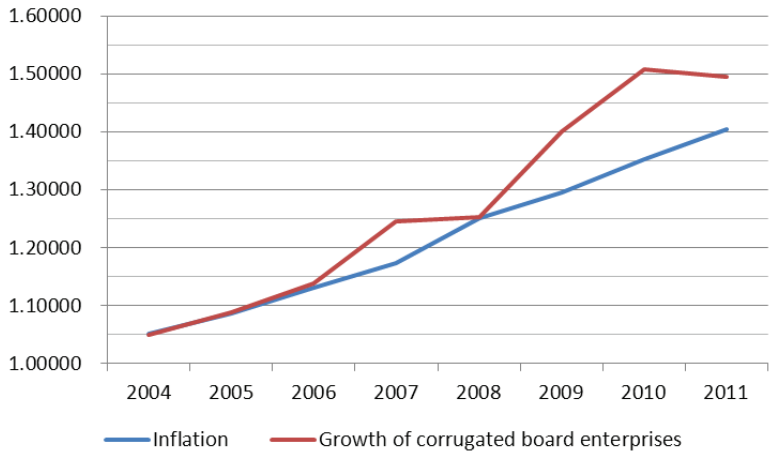
	2003	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*
National GDP	7,555,803	7,863,292	8,120,843	8,531,658	8,818,616	8,926,008	8,390,676	8,859,730
Porcentual Variation		4.1%	3.3%	5.1%	3.4%	1.2%	-6.0%	5.6%
Manufacturing Industries GDP	1,345,383	1,398,307	1,448,139	1,533,894	1,560,462	1,549,082	1,395,999	1,533,969
Porcentual Variation		3.9%	3.6%	5.9%	1.7%	-0.7%	-9.9%	9.9%

Source: Own elaboration with data of INEGI, 2011.

As for the corrugated industry, growth in the same period has been higher than inflation (Graphic1), but its real growth has been only 6.6%, far below the national level and also in relation to the manufacturing

sector. This represents that the corrugated cardboard industry is a sector that is not contributing to the height of other sectors of manufacturing.

Gráphic 1
Growth of enterprises of corrugated board with regard to inflation



Source: Own Elaboration with information of Anuario Estadístico 2009 del Cartón Corrugado. IACOR and data from INEGI, 2011.

Analyzing the data of Figure 1, we see that the years 2007, 2009 and 2010 have been far superior to the inflation growth, and also particularly in the worst year of the recent global crisis in 2009, paradoxically was the best year for the cardboard industry with a growth of 11.8%, hence we can affirm that the crises are not a factor in this sector, but quite the opposite.

Due to the contribution of the economic growth of corrugated cardboard companies in Mexico, and the strength that can be taken to avoid financial crises would be desirable to revise their levels of performance through financial reasons, such as liquidity ratios, debt ratios and the ratios for the market value (Tracy, 2003), so that it can be inferred that these reasons are variables associated to growth as a contribution for the GDP and the strength of the companies. However, these values are unknown since the firms in Mexico are not listed on the Bolsa Mexicana de Valores (Mexican Stock Exchange Market).

A corrugating company is one that has at least one machine capable of making sheets of cardboard, also includes flexographic machines and

metal stamping for printing and cutting the cardboard packaging, (AnuarioEstadístico de la Industria del CartónCorrugado. 2009). In addition, it has printing machines to fabricate corrugated cardboard boxes. There are 129 companies in Mexico (see attachment - location of the cardboard companies), located in the State of Mexico, Guanajuato, Nuevo León, Mexico City and Jalisco, all of these represent with 72% of all establishments. Besides, 28% of the remaining companies are found in other 16 states ofthe Mexican Republic.

However, there are also sheet plants, which only have printing and converting equipment. There are approximately 209 sheet plants in Mexico and the largest concentrations of these are located in: Nuevo León (50), State of Mexico (25), Jalisco (24), Guanajuato (18), Distrito Federal (16) and Chihuahua (13), and San Luis Potosí (11) who contribute 75% of the locations. The remaining 25% (52) are located in other 13 different states (Anuario Estadístico de la Industria del Cartón Corrugado, 2009).

In this regard, there are also companies supplying paper for the production of cardboard boxes. There are 32 companies in the national territory nationwide which produce paper *kraft* and semi-*kraft* for making cardboard as raw material. Nine of these companies are in the State of Mexico and five in Nuevo León. The remaining 18 companies are in other 12 federal entities (Anuario Estadístico de la Industria del Cartón Corrugado, 2009).

On the other hand, with regard to staff working in this segment, there are approximately twenty thousand employees, with an average of 220 people per plant (Anuario Estadístico de la Industria del Cartón Corrugado, 2009). However, most of the personnel occupied by plants belong to a union. Usually, it is observed that workers have not had an academic education at the tertiary level and can represent approximately eighty-five percent of each of the plants. In addition, they are not those persons who take the fundamental decisions of the company. Similarly, Trotsenburg on *PerspectivasdelBanco Mundial en Educación* (Villa and Núñez, coordinators, 2009) believes that it is undeniable that the economic performance of the country has a high correlation with the quality of workmanship.

Therefore, the executive, managerial and even supervisory levels are those who can count on academic preparation; these can represent approximately thirty people per company which may have an undergraduate degree. The owner or director of each of the plants is the person who

makes fundamental decisions, but the rest of them collaborate for the performance of the organizations.

However, the way of management in a corrugated cardboard packaging manufacturing plant presents a very traditionalist structure. This means, there are conventional areas such as sales, administration, human resources, quality, production planning, maintenance and production. The last four areas are primarily those involved in the operation of the plant. If companies design staff academically prepared (graduated from IHE's) to manage these areas, usually, will be graduates such as administrators, accountants or engineers.

In relation to personnel, some businessmen or executives in this industry placed people of their confidence that has had experience in the field; however, the level of academic preparation does not endorse to find improved methods, better techniques or production tools; they only resolve routine problems, but with difficulties they take initiatives to improve productivity, because apart from true ignorance, they are fully subject to the decisions of the heads.

On many occasions, some persons have excelled in the daily operation and have been promoted to supervisors, but they have limitations with the management of staff; and generally, they do so under a coercive style and are very oriented to operating results despite any circumstance. However, they present palliative solutions but not a consolidation sustained of achievements.

The importance of management in the corrugated cardboard plants has its impact on the productivity of the company because decisions taken impact directly on improvements to the organization (IACOR 2006). Each plant has different level of effectiveness, and consequently an effect on productivity, will be aware managers take preventive measures to avoid financial crises and whose strategy involves trained personnel of educational institutions? The question is whether managers of this sector are being supported by staff with academic preparation to achieve the best results in their organization; alternatively, if the universities are doing something to get closer tothe productive sectors and specifically in this industry.

If employers or managers are looking for trained personnel, should be detailing the contribution to the companies that have the training of graduates. That is, if having the qualified staff, can really make decisions to make enterprises more prosperous and solid in their performance. As an example, it was observed that a production manager in a company of

cardboard which did not have academic level set an objective to obtain a certain number of tons of production monthly. When mentioned how he would achieve that performance in short months such as February and December, he replied that by generating extra time on weekends. This decision is totally unproductive and perhaps the Director could be aware of this particular situation, but when taking this kind of decisions generally are not associated with the overall financial performance of the company. In this case there was a person who had no academic degree, but it can be questioned if the graduated staff with certification is really prepared to take sound decisions for the good performance of this industry. One must be wondering how managers of such companies are really looking for people prepared to make the best decisions, or just, are considering performer actors of the orders they decide, at the lowest cost. Moreover, whether the level of education of the key personnel is associatedwith the performance of the company's growth, then different results will be obtained.

The contribution of the educational sector in Mexico

In the past two decades Mexico has developed accelerated educational reforms loaded with innovation and contributions to meet the needs of the so-called era of knowledge and information.

From the organizational point of view, UNESCO conducted the World Conference on higher education in 1998, where it was recognized that the great challenge was to reduce the gap between rich and poor countries, such reduction demanded a new distribution of knowledge globally (ANUIES, 2000). Likewise, higher education and research are essential parts of cultural and socio-economic development, as well as environmentally sustainable for individuals, communities and Nations (ANUIES, 2000).

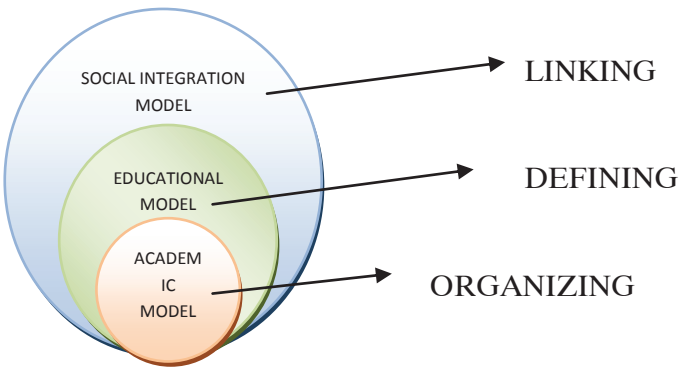
The above only showed, more than one decade ago, that the work for IHE's should be centered on three general aspects: coverage with equity; relevance and quality of education offered and; coordination of the system from the integration.

In addition, during 2002 it was signed an agreement by various actors of society "Mexico, social commitment of the quality of education" in which Blancas de la Cruz in *Participación Social para la Seguridad y la Calidad Educativa* (Villa and Núñez, coordinators, 2009) considered

among the main problems of the educational system for higher education, the lack of articulation, rigidity in the study programs, insufficiency in the diversification of the institutions, repetition and dropout rates, lack of achievement, problems of coverage and inequality between states, regions and social sectors.

Thus this scenario pushed the IHE's to develop actions that respond to those needs. Therefore the first step consisted in seeing the big picture and the functions of its components: the academic model: organizes; the educational model: defines; and the model of social integration: links; the above is based on the real needs of the global world and in particular of the Mexican society (Figure 2).

Figure 2
Articulation of the models



Source: Secretaria Académica, DEMS; División de Innovación Académica del Instituto Politécnico Nacional, 2010.

Contributions occurred in:

- technology opening in mixed and distance modalities;
- considering the productive sector (economic system) as seen and tested in equal opportunity presented in the social and educational systems of the country;
- the IHE's and their professions were subjected to relevance studies to the educational offer and thereby emerged indicators that would evaluate their work beyond the terminal efficiency: linking, internationalization and cooperation.

Parallel work has resulted in all three academic, social and economic contributions reflected in the new curriculum, offering a flexible, innovative, consistent and training in constant link with the productive sector (Model of Social Integration of the IPN, 2004); in both public and private universities. Nowadays, it is proposed a solid profile of graduates, characterized by a comprehensive outline, with knowledge, skills, values, attitudes and solid scientific and technological training being capable of solving, proposing and innovating in real contexts.

The role of a national linking turns out to be a first level indicator, because it is through it that gives the tie between education and productive sectors. The EncuestaNacional de VinculaciónaInstituciones (INAVI), in 2008, gives the linking capabilities diagnosis of 351 universities (a total of 1687 IHE's), selected randomly, in where the results observed in Table 2 were exposed.

Table 2
Linking activities realized by IHE's (Nationwide)

Category	*% of Affirmative Responses*
Are companies or organizations involved in academic training for students?	89.59
This institution offers continuing education services?	86.33
It has activities of job placement for graduates?	87.65
Consulting services are offered in the institution?	68.09
In this institution do research, experimental development and innovation with their own resources?	54.54
Technology services are offered in the institution?	36.17
Companies or agencies carry out activities for the strengthening of the teaching staff?	18.36
This institution has business incubators?	16.31

Sources: retrieved on September 2, 2012 from http://www.vinculacion.ses.sep.gob.mx/jsp/general/doctos_estadisticas/ENAVI_21_10_10.pdf

Some reflection is going in the direction of improving conditions not only for graduates but teaching staff and the activities of research, experimental development (educational, social, and technological) innovation in such a way that one would expect a parallel evolution, and even more, when confronting with a first-order data: number of the employed

population by an economic activity sector (until the second half of 2012: 48 ,437,762 persons; tabulations and indicators of occupation and employment, INEGI) because in a not very distant future, should respond in proportion by the IHE's.

It should be noted that in the educational system, traditional universities do not necessarily are represented only by them, also Medina de la Cerda in *PolíticaEducativa y Responsabilidad Social en la Calidad de la Educación Superior* (Villa and Núñez, coordinators, 2009) includes the technological universities which were established in 1991 with the aim of promoting the link between academia and the productive sector, as countries with stronger economies reflect growth in enrolments in universities, such is the final effect in its GDP.

Consequently: what should the IHE's care for a quality linkage with the companies? Empathic training and high-quality teachers and students, a social-technological research, incubators of talent with authorship and a culture of continuous learning are concepts that need to be analyzed.

Conclusions

According to the economic results of Mexico with regard to other Nations, it is required to advance more forcefully, and particularly the performance of corrugated board companies need to be improved because it has been below the average compared to other sectors. It is suitable to continue to investigate if the companies in this part have consciously adopted management measures to have a financial architecture to prevent crises, that is, if administrative and strategic measures are being considered to ensure stronger organizations and among these, particularly are included the educational segment, hiring academically trained staff to make good decisions on related operations and processes.

The role of entrepreneurs is quite important; however, the contribution of their organizations as a whole, in this industrial sector is not reflected since there is not a significant contribution to the national economy. How the education factor is highly conclusive to positively contribute to this growth? And where appropriate, how the graduate profile of the educational system, can be enough to support the growth of this industry sector? or how should be a conjunction of companies and IHE's synergy, in order to be more efficient and have better results?.

It is mentioned that despite the large resources that exist for education in Mexico there is still too much to improve, and on the educational offer where there are different types of IHE's: professionalizing, research and commercial institutions (Villa and Núñez, 2009), will be enough to support the cardboard industry sector.

References

Ahlstrom, D. (2010). Innovation and Growth: How Business Contributes to Society. *Academy of Management*. The Chinese University of Hong Kong.

Anuario Estadístico de la Industria del Cartón Corrugado, (2009). Instituto Americano del Cartón Corrugado. IACOR.

Dwyer, S., Mesak, H. and Hsu, M. (2005). An Exploratory Examination of the Influence of National Culture on Cross-National Product Diffusion. *Journal of International Marketing,* 13(2), 1–28SSN 1069-031X.

Goldratt, E. (2003). *Production The TOC Way*. Revised Edition. Massachusetts. North River Press, Inc.

Instituto Americano del Cartón Corrugado, S.C. (IACOR), (2006). BoletínElectrónico. Julio, 5.

Jenkins, A. and Healey, M. (2009).*Developing undergraduate research and inquiry*, retrieved on August 19, 2012, from http://www.heacademy.ac.uk/assets/York/documents/resources/publications/DevelopingUndergraduate_Final.pdf

Kukulska-Hulme, A. (2010), Learning Cultures in the Move: Where are we heading? *EducationalTechnology&Society*, 13 (4), 4-14.

Ledo, M. (2010). *Hacia una nueva arquitectura financiera*. 25 Jornadas de Alicante sobre la Economía Española, 2010. BBVA Research.

Padua, J., (2004). *Técnicas de Investigación Aplicadas a las Ciencias Sociales*. Tenthreprintedpublication. México. Fondo de Cultura Económica.

Romero Ortíz, M. (2011). El acercamiento de México a Asia Pacífico. Hacia la firma de un Acuerdo con la República de Corea y un balance del Acuerdo de Asociación Económica con Japón. *Asian Journal of Latin American Studies*, 24(1), 29-52.

Tracy, J. (1983). *How to read a financial report. For managers, entrepreneurs, lenders, lawyers, and investors*. Second Edition, John Wiley & Sons, New York.

Villa Rivera, J. y Nuñez Urquiza, C., Coordinadores (2009). *Compromiso Social por la Calidad de la Educación. Memorias del primer congreso nacional*. Tomo II. Instituto Politécnico Nacional y Compromiso Social por la Calidad de la Educación. Primera Edición. México.

Wang, Y. (2011). Understanding Economic Development and Institutional Change: East Asian Development Model Reconsidered with Implications for China. *Journal of Chinese Political Science/Association of Chinese Political Studies 2010*.J OF CHIN POLIT SCI (2011) 16:47–67
DOI 10.1007/s11366-010-9129-8.Published online: 23 November 2010.
World Economic and Social Survey 2010.*Reforming the International Financial Architecture*.Chapter V. retrieved on August 18, 2012 from
http://www.un.org/en/development/desa/policy/wess/wess_current/2010wess_chapter5.pdf
Yarto Chávez, M. (2010). Thesis: *Modelo de Mejora Continua en la Productividad de Empresas de Cartón Corrugado del Área Metropolitana de la Ciudad de México*, Escuela Superior de Comercio y Administración, Unidad Santo Tomás, Sección de Estudios de Posgrado e Investigación. Instituto Politécnico Nacional.

Internet references

http://money.cnn.com/magazines/fortune/global500/2012/countries/Australia.html?iid=top3
http://todaynewsgazette.com/fortune-global-500-2012/
http://www.anuies.mx/servicios/d_estrategicos/documentos_estrategicos/21/index.html
http://www.inee.edu.mx/index.php/bases-de-datos/banco-de-indicadores-educativos
http://www.inegi.org.mx/Sistemas/temasV2/Default.aspx?s=est&c=25433&t=1
http://www.quimica.unam.mx/cont_espe2.php?id_rubrique=20&color=526C11&id_article=59
http://www.vinculacion.ses.sep.gob.mx/#

Attachment – Location of the Cardboard Companies

State	*Número of corrugated companies*
Baja California Norte	4
Chiapas	1
Chihuahua	3
Coahuila	2
Distrito Federal	9
Estado de México	37
Guanajuato	21
Hidalgo	4
Jalisco	8
Morelos	2
Nuevo León	18
Puebla	4
Querétaro	5
San Luis Potosí	2
Sinaloa	3
Sonora	1
Tabasco	1
Tamaulipas	1
Tlaxcala	1
Veracruz	1
Yucatán	1
TOTAL	129

2
Business competitiveness, its inception and conditions: qualitative study with experts and business people

Paula Andrea López López[1]
Alejandra Cabrera Martinez[2]

Abstract

For the companies, competitiveness has become a challenge they cannot evade, however, there is a lack of knowledge about what Business Competitiveness is and the factors that affect its procurement, and even though there are diverse definitions, they differ in their analysis elements or the necessary maneuvers for its fulfillment. If there is any consensus, it lies on the relevance of the topic and the need for the organizations to answer to the prevailing conditions in the markets.

This document shows the results of a research made with experts and business people, about Business Competitiveness, and its contrast with the conceptual proposals of the most representative authors in the field. The study has a comprehensive focus, more than predictive or explana-

1. Business Administrator of the Universidad Nacional de Colombia, Master in Administration Universidad Nacional de Colombia. Researcher of the Research Group GIGO of the Universidad Central. plopezl@ucentral.edu.co
2. Economist of the Universidad del Valle, Master in Administration of the Universidad Nacional de Colombia Researcher of the Research Group GIGO of the Universidad Central. alejacabrera@gmail.com

tory; it was performed from a qualitative approach, based on a content analysis methodology.

Keywords: Competitiveness, Business Competitiveness, Competitiveness Factors, Qualitative Research, SMEs.

Introduction

Competitiveness has become a key condition to stay and grow in highly rivaled and globalized markets. According to the traditional discourse, this condition can be developed by the organizations through diverse strategies, tools and skills, however, every time that a business person tries to bring this concept to the organizational practices; they face a high volume of resources that promise reaching the much desired purpose. In this conditions the business person has two options: the first is to direct the organizational resources to miraculous tools without any promise of success, the second, to ignore those promises and continue doing everything that has allowed them to survive in the market.

When this example is translated to the Small and Medium Businesses of a country, with a developing economy such as the one in the majority of the countries of Latin America, the matter becomes even harder, as the requests are the same: (a) they need to compete in a global market, (b) with big companies, (c) high productivity levels and (d) enormous advertising budgets, among others, but their resources are even more scarce, hence, the survival decisions are essential. This endless amount of strategies, tools and resources striving for competitiveness is due, perhaps, to the lack of precision and diversity of what is understood as Business Competitiveness, which, in turn, is also augmented if we want to answer the questions: What factors affect the competitiveness of a company? And how can we measure the level of Business Competitiveness? How can we help the Small and Medium Business to survive in threatening conditions?

The most notorious agreement is given regarding the relevance that has been acquired by the Competitiveness and the need to develop resources that allow the business person to meet the market prevailing conditions, maybe not pretending to be the best but to endure. In this sense this work aims to identify the most important elements of the different lectures about Business Competitiveness: literature, experts in our field, business people and the extraction of the issues that in a future might

generate strategies, tools, skills and Resources to modify the organizational dynamics, always striving for Business Competitiveness.

In order to do so this paper is structured in three sections, as follows: (i) in the first part we will analyze the different conceptual perspectives found in the literature or framework (ii) in the second the methodological issues adopted in the investigation concerning an exploratory study are formulated from a qualitative approach, (iii) and in the last part the results and conclusions of the field study are shown.

Business Competitiveness and the factors that affect its construction: a framework

Whenever we talk about Business Competitiveness we refer to one of the levels that compose the Global Competitiveness (Country, Region, Industry, and Business) (Graph 1). The Business Competitiveness of a company is a product of the interaction given among all the economic levels, which are conditioned between them, but also is a product of its own decisions, in a game succession that we can deem strategic. In this way, the Businesses Competitiveness defines the countries, regions and industries ones; some industries define the Competitiveness of its nations; some nations have economic policies very focused on that define the Business Competitiveness and so on and so forth.

In terms of Abdel & Romo (2005) the Business Competitiveness is affected by the conditions that prevail on industry and region levels, but at the same time, the Competitiveness of businesses, industries and regions is affected by the prevailing conditions on a national level; in contrast, the proposal of Krugman (1997), retaken by Porter, that states *"Those who compete are not the nations but the businesses",* shows to us that what makes a country a competitive one is the performance of the businesses that conform its productive system and its interaction with the environment in which they develop their role. This is the main argument to justify the relevance and pertinence of studying Business Competitiveness.

As you can see, the Business Competitiveness phenomenon is complex, as there are no single cause or single direction relationships that would allow us to come to a standardized definition, the same happens with the identification of the factors that affect its achievement. Even though is true that the achievement of a consensus in the concept or the factors does not constitute a purpose of this document, this focuses on

the understanding of the Competitiveness as a diffuse phenomenon and aims to identify the issues in which there is a convergence or divergence in the different conceptual notions. Below, in the Table 1, some Business Competitiveness definitions and the factors that the authors consider as incidents on it are shown.

Table 1
Competitiveness Concepts and Factors That Affect Its Accomplishment

Competitiveness concept	*Factors that affect the Competitiveness*
For OCDE (1992) "Competitiveness is the degree in which the company can, under free market conditions, produce goods and services that endure the test of the international markets, simultaneously keeping and expanding the long term real incomes" (p. 237).	a) The successful management of production flows and stock of raw materials and components b) the successful integration of market planning, R&D activities, design, engineering and manufacturing, c) The capability of combining internal R&D with R&D performed in universities, research centers and other businesses, d) the capability of incorporating changes on demand and market evolution, e) the capacity of establishing successful relationships with other companies inside the value chain (OCDE, 1992).
From the systemic approach of competitiveness, the business' competitiveness (micro level) is "the result of the interaction of all the system levels (meso, meta, macro) such interaction is what generates competitive advantages in the businesses and is based on the organizational pattern of the society as a whole" (Esser, Hillebrand, Messner, Meyer-Stamer, 1994, p.14).	a) Staff and management capacity evaluation, b) Business strategies, c) innovation management, d) Best Practices in the complete production cycle, e) technological cooperation network integration, f) business logistics and g) interaction between providers, producers and users (Esser, *et al,* 1994, p. 25). In the same way, the authors believe that in the future the only competitive businesses will be those that meet four criterions at the same time: Efficiency, Quality, Flexibility and Speed (Esser, e*t al*, 2004, p. 33).

Competitiveness concept	*Factors that affect the Competitiveness*
Laplane (1996), states that: "the competitive performance of a business, industry or nation, depends on a wide set of factors that can be subdivided among the business interns, others with structural nature (unique of each one of the sectors inside the industrial complex) and those of systemic nature" (p. 57).	The internal factors of the business are those that lie inside its decision power and with which it tries to stand apart from its competitors. (a) They include the amount of resources cumulated by the business, (b) the competitive advantages it has and its skill to implement them. The structuring factors are those that, even though are not entirely under business control, are partially inside their influence sphere and characterize the competitive environment it faces. And the systemic nature factors that determine the competitiveness are, strictly speaking, those external factors for the business that also affect the competitive environment and that can affect in a meaningful way the competitive business advantages (Laplane, 1996).
Garay, from the competitiveness determiners' approach defines the Business Competitiveness as "the business capability to state and apply coherent strategies that allow to widen in a lasting way, a meaningful position in the market" (1998, p. 621).	The author identifies three big factor groups: the business group, the structure group and the systemic. The business factors are those over which the business has decision making power that can be controlled or modified with its behavior. In this group the following can be classified (Garay, 1998, p. 621): a) Management, b) Innovation, c) Production and d) Human Resources. In the second group of factors, the structural ones, the business intervention capacity is limited, as they refer to the type of market, to the industrial structure and the bonus and regulation regime of each one (Garay, 1998, p. 622): a) Market, b) Industrial Structure, c) Bonuses and regulations. Finally, the third factor groups that affect competitiveness are the systemic. These constitute externalities for the business and therefore, the possibility of intervention on an individual basis over them is scarce. Garay groups them in six types (1998, p. 623): a) Macroeconomics, b) Politics and institutional, c) Legal and regulatory, d) Social, education, training policies and social security of the human resources, e) International and f) infrastructure.

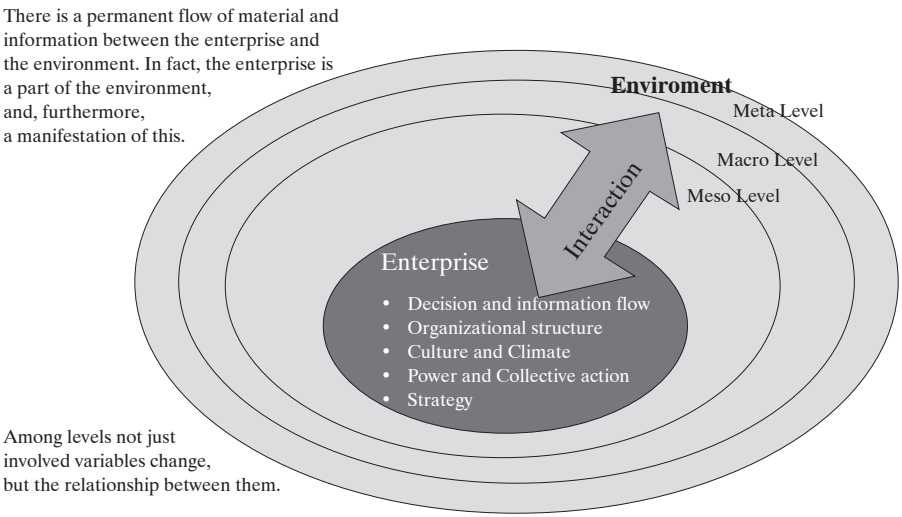
Competitiveness concept	*Factors that affect the Competitiveness*
For Abdel & Romo, researchers of the Centro de Estudios de Competitividad de México, Business Competitiveness is "the capacity to compete in the markets… derived from the competitive advantage of production and organization methods (final product price and quality) against its specific competitors, (2005, p. 203).	When referring to the underlying factors of Business Competitiveness they highlight the following: a) Research and Development, b) Worker Qualification, c) Cooperation with other businesses, d) Production and Manufacture Systems. They also state that, besides the internal factors that affect the business, there are other external variables that have an equally important impact over competitiveness. On industry level, the market concentration, product differentiation, international prices of the goods produced as the existence of an explicit industrial policy in the field. On regional level we can mention the existence of the required infrastructure, the existence of enough qualified workers, or the possibility of the appearance of agglomeration effects due to the location of several plants inside the same geographical area, in the same way, the variables on Country level have an impact over the business (Abdel y Romo, 2005).
Berumen considers that Business Competitiveness is "the businesses capacity to compete in the markets and based on its success, earning a market quota, incrementing its benefits and growth: generating dividends for the shareholders, and value and richness for the society".	He groups the factors in two types (2006, p. 147): the former are the ones related with prices and costs. The latter are related with: (i) product quality; (ii) technological improvement inclusion in the processes; (iii) the convenient adjustments in the organizational structure; (iv) the efficient production flux management; (v) the capacity to develop and keep relationships with other businesses; (vi) the good relationships with the public sector, universities and research centers; (vii) the design, engineering and industrial production, (viii) the worker capacity optimization thanks to training, and (ix) the key capacity of generating research development and innovation processes(R+D+I).

Source: Own creation base don OCDE (1992), Esser, Hillebrand, Messner, Meyer-Stamer, 1994, Laplane (1996), Garay (1998), Abdel & Romo (2005), Berumen (2006).

From the authors' thoughts, we can see that most of them consider Business Competitiveness as a capacity that is built by the businesses and that is reflected on their relationship with the market. Such competitiveness is based on the generation of competitive advantages created that

come from the interrelationship between both internal (organizational) and external processes; for which the permanent watch on the environment is a must. This led us to keep simultaneously into account the business and industry internal processes, as the economic and institutional conditions of the productive environment in which the Business is located. The group of authors propose the existence of both endogenous and exogenous factors that promote the Business Competitiveness, for this reason, the probabilities for a business to reach and keep its success levels would lie on the distinctive competences or advantages that it develops internally or on the external conditionings given by the environment, regarding the industry or field to which it belongs and the region-country in which it is located (Graph 1).

Graph 1
Analysis Levels of the Business Competitiveness



Source: The authors based on United Nations and Cepal (2001).

In this way, issues like decision making, Resources available: tangible and intangible, the learning and information flux that comes and goes from the business to the environment and vice versa, are essential factors in the understanding of competitiveness. These proposals are made under the assumption that there are some elements under the business control, however, there are some elements does not follow this order,

the only choice available is to choose the adaptation mechanisms to the environment conditions, therefore, the business can be interpreted as a fractal of the environment in which it exists.

In the next section we will make a relationship between the methodological aspects of the research made to business people and experts.

Methodological aspects

This first research phase has an exploratory nature (Hernández, 2006, pág.100-102), it was performed from a qualitative approach and aims to understand the Business Competitiveness according to different actors that are considered experts in the field, both from their thorough study, (authors) and from their daily practice (business people).

Despite the importance of the topic in business performance, the business person perspective has not been studied in depth, for this reason we included a group of business people in this research. The main purpose of their inclusion in the study was to know the stance of those who perform the Business Competitiveness practices.

Then, a contrast was made between the business people notion, the notion of the experts interviewed and the definitions of the selected authors, this with aims of identifying the convergences and divergences between the players studied (Business people group, expert group and authors group); so that this can contribute to a wider comprehension of Business Competitiveness.

A qualitative analysis was performed, both to the business people and experts groups and to the conceptual proposal of the authors chosen, through the content analysis technique. The purpose of the qualitative analysis was to describe the qualities or distinctive traits of the discourse of the population studied, building meanings from such information.

The content analysis is a research technique for the objective, systematic and quantitative description of the stated content of the communication (Berelson, 1952. According to: Krippendorf, 1990), it is made with aims to formulate, based on communication contents, reproducible and valid inferences that can be applied to the context in which they are interpreted (Krippendorf, 1990). In this, starting with a data codification process, we build the meaning categories, we can also build subcategories that are directly related with the causal and contextual conditions that

intervene and the actions and interactions to, finally, build a conceptual network over the central category, i.e.: *the Business Competitiveness.*

After a general revision of the interview results to business people and experts, we identified 2 transverse questions for content analysis. The questions were: What is Business Competitiveness? And what factors affect the Business Competitiveness? Then we made the category codification and identification in order to be able to understand the perceptions of the study players on Business Competitiveness. The data were given by the top management and/or business people; to gather these we used a semi structured survey, which moved around the concepts the management and/or business person had about Business Competitiveness.

For the survey answer processing and conceptual revision we used the Atlas Ti (The Qualitative Data Analysis Software) software, which allowed us to analyze and codify the information, easing its systematization and interpretation. The procedure for the content analysis was as follows:

a. There is an *initial analysis of direct content* with aid of a prior reading that consists on the first revision of the material to be analyzed (interviews made to business people and experts), and the framework revision, from which the main analytical categories will be identified for its classification in the future.
b. Then, an *inductive qualitative analysis* with three steps *was performed, as follows:*
    - Open coding in the foreground, codes and categories with which we find specific answers, meanings and similar senses or agreements inside the answers given by the business people, experts and by the authors from the classification and discourse analysis of those.
    - Background coding, codes and topics, which allows identifying through convergent and divergent elements generalization and frequencies, the answer grouping or dispersion.
    - Central category identification with which the conceptual model is summarized and graphed, synthetizing the information gathered, systematized and analyzed in the two prior processes.

Sample Selection The experts' selection criteria were people among the most representative in our field that have provided a Business Competitiveness concept, as a factor proposal that influence its achievement. From 15 authors read, we selected 6 that met the established criteria.

Table 2
Relation of Business Competitiveness Authors Read and Selected

Authors read	*Authors selected*
Michalet (1981), Alic, (1987), OCDE (1992), Porter(1993), Esser, Hillebrand, Messner, Meyer-Stamer, (1994), Urrutia (1994), Laplane (1996), Garay (1998), Vallejo (1999), Malaver (1999),Abdel& Romo (2005), Valero (2004), Román (2004), Reinel (2005), Berumen (2006),	OCDE (1992), Esser, *et al* (1994), Laplane (1996), Garay (1998), Abdel& Romo (2005), Berumen (2006)

Source: Author elaboration (2012)

From a population of 200 businesses[3], of different economic fields: 55% of the service field, 30% of the industrial field and 15%of the commerce field, we made a Non probability convenience sampling method that allowed us to select a final sample size of 34businesses. The selection criterions were: a) More than 10 years in the market, b) Interest for participating in the study (information access).

The experts' interview guide was structured with the next 7 questions:

1. In your opinion, is competitiveness a business characteristic? What is the business role in the competitiveness?
2. Have you taken or designed your own competitiveness definition? Can you share it with us?
3. What do you think are the factors that affect the Business Competitiveness?
4. Is there any methodology that keeps into account such Business Competitiveness determinants?
5. Do you think that the same determinants apply to SMBs?
6. Is it possible for the SMBs of our country to be competitive?
7. What documents have you written about this topic?

The interview guide for business people was composed by 5 questions:

1. What is competitiveness for you?
2. What is business role in competitiveness?
3. What do you think are the factors that affect Business Competitiveness?

3. Data base providedbythe Universidad Central fromthe Unidad de Emprendimiento of the Departamento de Administración de Empresas

4. Do you have any type of practice that has enabled you to improve your competitiveness?
5. Does the competitiveness improvement have been given incrementally on the training and performance level of your human resources?
6. Do you have or have you thought about implementing cooperation strategies to improve your competitiveness?

The businesses that composed the study have the following characteristics: According to their size, they belong to the SMBs (small and medium) category[4] of Bogota, Colombia. Regarding their permanence in the market, the businesses between 11 and 20 years in the market were predominant, followed by those between 21 and 30 years, what indicates that the majority of the businesses studied have a remarkable permanence in the market. Regarding the economic field, the majority belongs to the industrial field, but we had businesses of different economic fields in the study.

Results

Business People Group

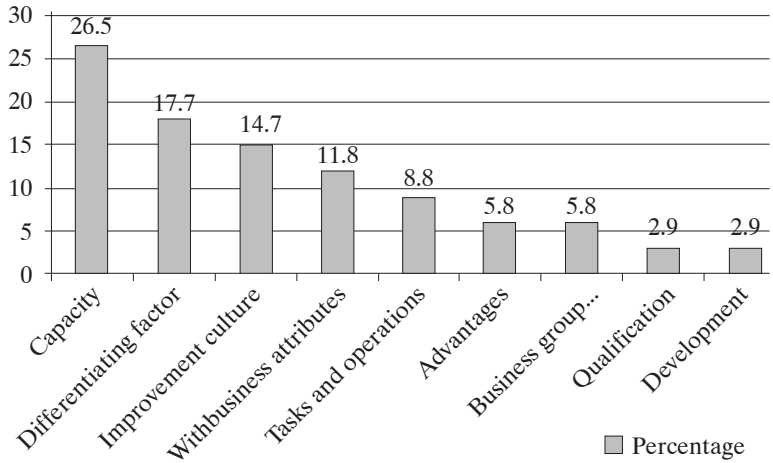
Among the SMBs business people there is (as well as among the authors) a diversity of considerations to define the concept and the factors that affect the competitiveness of a business. However, the business people acknowledge that the competitiveness notion plays a key role, as this idea, whatever it is, has a high impact in the business role and becomes a starting point to promote certain types of actions, mechanisms and practices to reach what is considered competitiveness from its notion.

In the systematization of the question 1 what is Business Competitiveness? We could see two discursive structures: the type 1 was related to the business people's answers that associated competitiveness to a specific concept and who then stated the indicators that compose the concept. The definition can be associated to a conceptual reference adopted from literature. As a result we obtained the following frequencies in the

4. According to the classification created by the Act 905 of 2004- Mipymes Act in Colombia. A SMB is a business with a staff between 11-50 workers (small) and 51-200 (medium)

competitiveness definition that answer to the discursive structure type 1 (Graph 2).

Graph 2
Competitiveness Concept for Business People Discursive Structure Type 1



Source: authors' creation (2012)

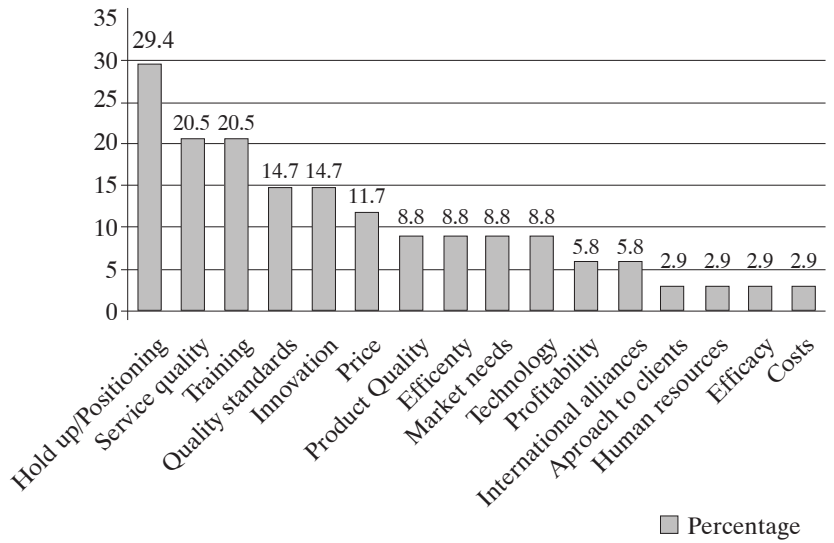
In the question coding in the definition of the discursive structure type 1 we found that competitiveness is related on a 26% with the "Capacity" concept, a 17% with the "Differentiating Factor"; 14% with "Improvement Culture"; 11% with business attributes; 8% with tasks and inner operations; 5.9% with advantages and dynamics of the business group in the market; and finally, 2.9% with "qualification" and "development" categories.

The discursive structure type 2 understand competitiveness as the practical or empirical element associations, even indicators, that in some way measure or render account of the concept. In this definition we could not see or register any bibliographic reference, the answers of this type use forms such as: "competitiveness has to deal with", "is related with", "is very important to take into account", among others. Summarizing, type 2 did not define the concept, but instead, enumerated directly its components and indicators (Graph 3).

The competitiveness definition results in the discursive structure type 2 can be understood as the set of factors or indicators that represent competitiveness:

Graph 3

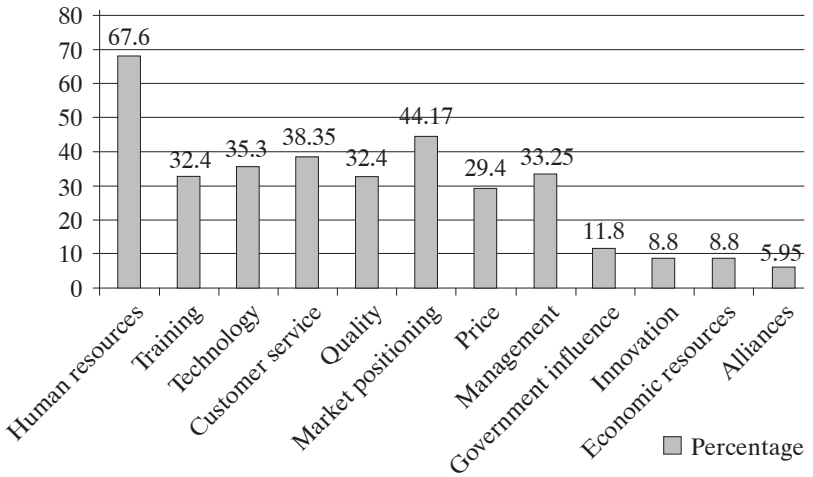
Business people competitiveness concept discursive structure type 2



Source: Authors' creation (2012)

In the former graph we can observe the set of indicators with which the business people explain the competitiveness concept, framed inside the discursive structure 2. Most of this business people subgroup considers that "sustaining and positioning itself" (29, 4%), is the most important indicator to evidence competitiveness. Other elements that are used to understand it are "service quality", "staff formation", "quality standards", "innovation" and "price", among others. Regarding the second question: Which do you think are the factors that affect the Business Competitiveness? The business people answered:

Graph 4
Business Competitiveness factors defined by the business people group



Source: Authors' creation (2012)

Each business person related more than two key factors in the Business Competitiveness; for this reason there is richness in their answers. As you can see in the Graph 4 the business people consider as relevant factors for Business Competitiveness: the human resources, followed by market positioning, customer service, technology, training, quality and management. Price keeps being, for business people, an important factor in competitiveness, however, it is interesting to identify that innovation and alliances (associativity) does not play a definitive role for them.

The experts

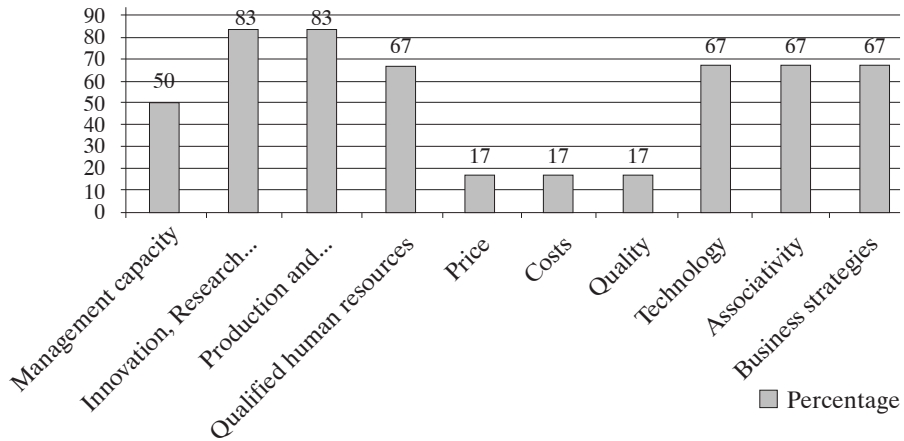
The Business Competitiveness concept analysis proposed by the expert evidence that most of them consider it as a business developing capacity .i.e., it is a quality they develop and that in a very important degree depends on itself to reach a proficiency level, even though is clear that there are external factors that affect it negatively or positively, the way in which the business uses those external factors is also a skill.

From the ideas mentioned above we were able to determine that for the expert competitiveness is the result of a combination of multiple and

diverse elements that as a group allow the construction and generate the conditions for Business Competitiveness, instead of a single factor that determines it. Consequently, regarding the factors, we identified and agreement in most of the experts, when posing two large groups that affect its success: (a) the factors over which the business can have control, particularly associated with the internal and,(b) the exogenous factors that, even though have the capacity to condition the Business Competitiveness, there is no possibility of affect them.

Despite the fact that they do not state this expressly, most of the experts consider competitiveness as a complex phenomenon that evokes its main manifestations through the characteristics of the subjects found and the relationships among these individuals.

Graph 5
Business Competitiveness factors defined by the experts



Source: Authors' creation (2012)

Regarding the internal factors that affect the Business Competitiveness, the experts pointed as the most important: innovation and production and manufacture systems (83,3% c/u), followed by qualified human resources, technology, associativity and business strategies (66,7 % c/u). Management capacity was also deemed important for accomplishing competitiveness (50%). Even though the costs, Price and quality (16, 7% c/u) are, according to the authors, elements that contribute for a business to be competitive, they keep losing their incidence on it. We can infer

that those factors that generate more added values to the business dynamics and allow the business to differentiate from the competence are those that the experts consider key in competitiveness terms.

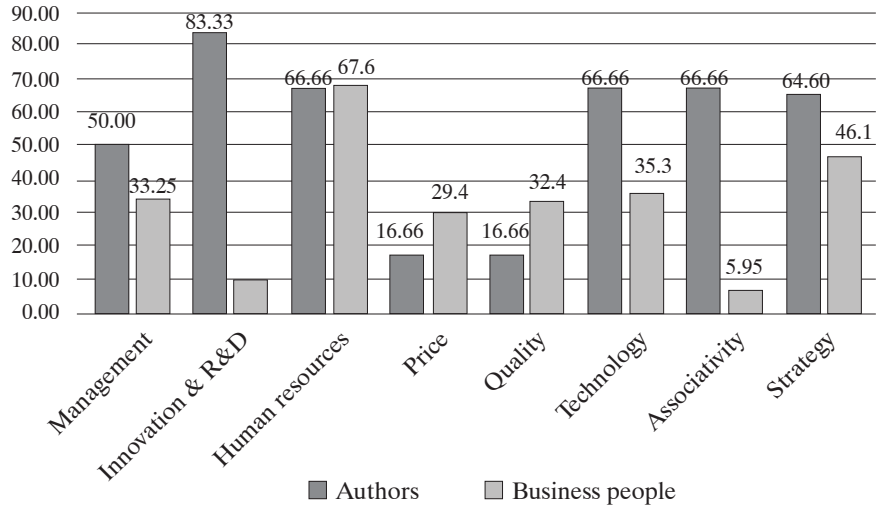
Discussion

For the business people, competitiveness is a concept that explains why a business sells more than another, thus, the ***sales volume*** indicator is only the end of the equation. The concept from the traditional perspective has been How do we produce more attractive goods and how do we sell with better prices reducing costs? This translates the equation in three simple items: (a) sell a lot, (b) generate attractive goods, (c) reduce costs. For the experts, who feel that the businesses are undertaking generalized cost reduction processes, competitiveness has a direct relationship with the business capacity to generate sustainable competitive advantages with time. Both for the authors and the business people, competitiveness is reflected in the way the businesses perform in the markets where they are.

When we asked about the competitiveness factors, the business people relate them with inner elements of the business while external factors, such as the Government influence, are mentioned tangentially. Thus, the business person focuses on the inner aspects, ignoring in some cases, the political, social, economic and cultural factors as conditions of the Business Competitiveness. On the other hand, the experts refer both to the exogenous and the endogenous factors that surround the Business Competitiveness, something that shows a higher awareness of the organization relationship with its environment to reach the success.

In the Graph 6 we show the relationship, regarding competitiveness factors, between experts and business people. A first convergence is given in the factors that were named by both groups in the graphs, however, the percentages show that each group gives more or less importance to certain factors. For example, for business people innovation has a low value, while for the authors it is the most relevant factor. The authors did not consider factors such as training, customer service, economic and financial resources, among others named by the business people. In the same vein, the experts named factors such as business strategies, production systems and costs that were not taken into account by the business people.

Graph 6
Comparative Business Competitiveness factors:
Business people-experts



Source: authors' creation (2012)

The point where we found a match between both sides in factor and percentage is the human resource, however, in the majority of the factors here shown, there is a difference in the relevance given by each group. Another situation happens with price and quality, which are still issues to be taken into account, but with higher relevance for business people than for the authors. Regarding management capacity and associativity we can see the preponderance given by the authors. In the case of associativity is remarkable the importance degree given by the authors (66,7%), against the opinion of the business people (5,95%).

The business people subgroup that defined Business Competitiveness in the discursive structure type 1 i.e. that relates it to a concept, shows convergence on the conceptualization made by the authors group in terms of defining it as a capacity that is created by the business. Its closeness with the group of authors chosen can be given to the education of the manager/business person interviewed. Even though we did not inquire about the education level, we can frame a hypothesis establishing that states that the idea of competitiveness of this subgroup depends on

its education level. We would have to corroborate this relationship to ensure the relevance and sufficiency of the variable education with the concept measurement. The Business Competitiveness problem can lie in to a large extent with the management capacity of the person who does it, what directly affects the way in which the Resources are managed in order to create distinctive qualities. Therefore, the competitiveness concept of the manager/business person defines the way they act and where do they target their organizational resources and efforts.

Both for the group of managers /business people as for the group of authors we selected, the market is the final judge of Business Competitiveness. If the businesses manage to last in the current, dynamic, highly rivaled and globalized markets, this in some way proves that its business dynamics are developing lasting competitive advantages that are being recognized by its target market.

From the information relationship obtained from the groups studied, we propose 10 factors that affect Business Competitiveness. Such factors does not have a hierarchy, however, given the fact that the exogenous conditions are not modifiable and that the organization develops capacities by itself, ***management*** is one of the factors that can affect deeper the achievement of a Business Competitiveness. The factors are: Management, Organizational Culture, Intellectual Capital, Innovation, Quality, Technology, Markets, Associativity, Strategy, and Service.

The definition of the factors that affect the Business Competitiveness, allows widening the comprehension and striving for its construction but, as well as with a wide number of definitions, there are different appreciations regarding the factors that allow us to reach the much desired goal.

Final thoughts

Business Competitiveness, is a complex phenomenon that is based on relationships between both internal and external elements of the business, as it depends on multiple factors and demands the development of different adaptive behaviors that cannot be established in a single formula of successful behaviors. This issue will be dealt in the following stages of this research.

Regarding the Business Competitiveness definition, this research did not want to validate a single concept, but to exhibit the different perspectives on a relevant topic. From the perspective of the authors and experts

group, it is a capacity built by the business and even though the businesses need to be proficient in order to last in the current markets, not all of them manage to do it, something that is translated in a survival issue. For this reason, the Business Competitiveness is associated with skills or competences that the organization develops from its own experience and learning.

Based on this, Human Resources is one of the most relevant factors within the frame of Business Competitiveness, it was valued in the same way both by the authors chosen as by the managers/business people interviewed. Both groups consider that people, who compose the business, allow generating competitive advantages differentiating between the competitors of a single market from the set of knowledge, skills, attitudes and dexterities they have. People are what make the difference.

Associativity is an element that is not too important for the managers/business people, in contrast with the authors group. Among business people there is not too much interest for cooperation strategies or networking, and they still do not recognize the benefits it could bring for their business competitiveness. It is not about forsaking the concepts of competence and profitability but striving for the business improvement as a whole. Probably, the rise of associative and collaborative models appears precisely as an answer to the high competitiveness levels as a product of the emerging markets, with aims to guarantee their survival and endurance, as it is proposed by the group of studied authors, and the sooner the business people integrate it into their companies, better would be their business results.

We also could observe that price and productivity are less relevant as determiners of Business Competitiveness, those factors are important if they conform a wider set of elements, that in their relationship allows reaching better business performance levels, but that more than a quality for competitiveness currently they are a *sine qua non* condition to exist.

Based on the research it is possible to state that, while the experts recognize the importance of the investment in human resources and technology as elements that can provide competitive advantages in the markets and that they recognize that the networks, the knowledge development and innovation, would allow small and medium business to thrive, reducing the costs and making them more manageable, the business people have not consider them yet. This issue can be considered an input for public policies in science and technology currently developed, but also for the productive and competitiveness policies.

References

Abdel, G. & Romo, M. D. (2005).Sobre el concepto de competitividad. *Comercio Exterior*. 55(3), 200-124.

Alic, J. (1987). *Evaluating industrial competitiveness at the office of technology in society.* New York: Basic Book Inc.

Berumen, S. (2006). Una aproximación a los indicadores de la competitividad local y factores de la producción. Cuadernos de Administración Universidad Javeriana. 19 (31), 145-163.

Esser, K., &Hillebrand, W. (1996). Competitividad sistémica: nuevo desafío para las empresas y la política. *CEPAL*. 59, 39 -52.

Garay, L.C (1998).*Colombia: Estructura industrial e internacionalización 1967-1996.* Colombia. Departamento Nacional de Planeación, Colciencias, Consejería Económica y de Competitividad, Ministerio de Comercio Exterior, Proexport.

Hernández, R. y Fernández, C. (2006). *Metodología de la investigación*. México D.F: McGraw-Hill.

Krippendorf, K. (1990). Metodología de análisis de contenido. Teoría y Práctica. Edit. Paidós Comunicación.

Krugman, P. (1997). *El internacionalismo moderno, la economía internacional y las mentiras de la competitividad.* Barcelona: Crítica. GrijalboMondadori.

Laplane, M. (1996). Estudio sobre competitividad de la industria Brasilera. *Productividad, competitividad e internacionalización de la economía*. Colombia: DANE.

Malaver, F. (1999). *Lecturas sobre Competitividad, Empresa y Educación Gerencial.* Bogotá: Centro Editorial Javeriano.

Michalet C.A. (1981). Competitiveness and Internationalization. Paris: Mimes. OCDE.

Naciones Unidas & CEPAL (2001). *Elementos de competitividad sistémica de las pequeñas y medianas empresas (PYME) del Istmo Centroamericano. LC/Mex/L.499, 54.*

OCDE, (1992a). *Technology and the economy: the key relationships:* Paris.

OCDE, (1992b). Competitiveness. *First report to the president and the Congress.* Washington D.C.

Porter, M. (1993). La ventaja competitiva de las naciones. Buenos Aires: Ediciones Javier Vergara.

Reinel, J &Bermeo, E. (2005). Las directrices del costo como fuentes de ventajas competitivas. *Revista EstudiosGerenciales.* 81-103.

Reinoso D. (1999). *La competitividad de los estados mexicanos*. México: Instituto Tecnológico de estudios superiores de Monterrey (ITESM).

Román, R (2004).*Teorías y Mediciones de Competitividad: Una Perspectiva.* Bogotá: Universidad DistritalEditores.

Vallejo, C (1996) *Competitividad: Aproximaciones conceptuales.*Bogotá: Centro de estudios regionales, cafeteros y empresariales CRECE

Valero, M. (2004). *Análisis de competitividad al sector del dulce en el área metropolitana de Bucaramanga*. Bogotá: Ascolfa.

3
Determining the potential external intangible liabilities of the companies Televisa and Wal-Mart in the category of information, over the period march-august 2012

Anselmo Salvador Chávez Capó[1]
María Josefina Rivero-Villar[1]
Tito Livio de la Torre Hidalgo[1]

Abstract

Stewart (1997) defines intellectual capital as the sum of all the employees' knowledge that you have working in a company and give it a competitive advantage, It's study has been valued, (Viedma, 2007) to assess and measure intellectual capital in order to develop a plethora of methods (Andriessen, 2004).

Harvey and Lusch (1999) defined the company's intangible liability as the obligation to transfer economic resources or provide services to other entities in the future, dividing it into two groups and four categories. Caddy (2002) notes that potential impairment of intangible assets must be checked, because it would result in a source of future wealth destruction. Describing how information affects the value of a share as

1. Universidad Popular Autónoma del Estado de Puebla

a consequence of the available information and how can it be converted into an intangible liability or when that information will not affect its value will help in understanding this concept.

Keywords: Intellectual Capital, Intangible assets, Intangible liabilities

Introduction

Since Galbraith (1969) introduced the concept of Intellectual Capital, several authors have agreed that it represents the total value of the intangible assets that a company owns in a given moment of time with potential to generate value (Bradley, 1997; Edvinson and Malone, 1997; Stewart, 1997, Brooking, 1998). From this perspective, the intangibles are non-physical factors that contribute to or are employed in the production or provision of a service that benefits individuals or companies that control their use.

Traditionally, the tangible assets such as the physical and financial capital were the most valuable asset of the business but now the way was given to consider the category of intangible assets (Ventura, 1996; Brooking, 1996) as the key to competing in dynamic environments. While tangible assets are easy to identify and assess through the information provided by the accounting statements, the intangibles are invisible to that information due to its difficulty of valuation (Grant, 1996) because they are based on information and knowledge (Itami and Roehl, 1987; Sveiby, 1997a) that are not always verifiable (Navas and Guerras, 1998).

Another idea inherent in intangible assets is the embodiment of knowledge in the various business activities with which this materializes in intangible resources that determine the intellectual capital of the organization and that, in general, are not adequately represented in the accounting information.

Garcia-Parra, Simo and Sallan (2006) describe that the growth of investments in intangible resources carried out by the companies of the world from the end of the last century, where knowledge and the economic nature of the intangible as well as their identification and measurement, are the major concerns of the stakeholders in the results of the companies.

One of the most common expressions of the value of intellectual capital is the difference between the market value of a company and its value in books (Stewart, 1997), because it reflects the value added by the mar-

ket to the company above its book value, which does not represent the absolute form of intellectual capital due to the fact that financial markets are not efficient because they behave according to the information from a particular firm available in the market, increasing or underestimating the price of a stock based on the perception that the investor has from information that is public and available.

It is believed that there is a dissociation between what happens in the markets and the results reflected in the accounting systems, in the latter, values obtained are the result of the historical cost of equipment and inventory with which the company accounts, while the market value comes from expectations at its respect in the future, as a result of factors such as the cash flow and intangibles such as the organizational structure, patents, research and development and the workers' know-how (Mc Clure, 2003).

Therefore this decoupling should be explained, for this purpose, one of the concepts that have been developed is intellectual capital, however, one must consider that in spite of the investigations that have been made to understand its nature, there is no unanimity as to its definition, to allow description such as how to measure it with a universal acceptance.

This is why the calculation of the Intellectual Capital in a company, requires a financial valuation approach, as this allows you to view the company from the external point of view, it is designed to help analysts and investors to determine the financial value of the company (Marr and Chatzekel, 2004).

Caddy (2000) argues that we should have a clearly defined limit to point out certain things that are intangible assets and what is considered intellectual assets, even more, if both really exist there must be a counterpart to these concepts in the organization, that is, there must be intangible or intellectual liabilities.

Relying on authors that have contributed on this concept, Ramirez (2010) suggests that the intellectual capital is calculated as the difference between the intangible assets that the company owns and the intangible liabilities that it must endure.

The term intangible liability has not been sufficiently studied in the academic and business areas. It requires an analysis using methodologies that validate its existence to keep a record that it represents a new variable to analyze in the area of intangibles.

General objective

The work focuses on determining the potential external intangible liabilities of Televisa and Wal-Mart in the information category, during the period March - August 2012.

Theoretical framework

The relevance of the concepts intangible assets and Intellectual Capital coincides in the nineties with the rise of the so-called knowledge-based economy, however according to Simo and Sallan (2008) two unresolved problems remain; the corresponding to their measurement and evaluation where despite the about 40 existing methodologies (Andriessen, 2004) a set of valid indicators has not been achieved. This has an impact on the little development of scales for measuring the constructs associated with each of the concepts and the lack of a common terminology (Kristandl and Bontis, 2007) those facts justify the limited progress made to the date in the theory of intangibles in the organizations (Molbjerg-Jorgensen, 2006).

The lack of consistency in the terms and concepts employed has hampered the establishment of a clear measurement of the intangible assets, especially for those that make up the proposed dimensions in each model of the Intellectual Capital, which has meant an additional difficulty to progress in this field of knowledge, in García-Parra, Simo and Sallan's (2006) words, efforts have not resulted in accumulation of knowledge.

Despite the efforts to standardize concepts and taxonomies with scientific rigor, it is up to the presentation of the Meritum project (2002) where differentiated definitions for both concepts are proposed, including their distinctions with the intangible assets, although empirical works establishing this difference are still required (Kristandl and Bontis, 2007).

Intellectual capital

This term was coined in 1969 by Galbraith quoted by Bontis (1998). Subsequently, with the start of the era of knowledge and information, explanations for the differences between the market value and the value in books of certain listed companies are looked for (Garcia-Parra et

al. , 2006). In this sense, Edvinsson and Malone (1997) called Intellectual Capital to the difference between the market value and the book value, from this equation, different models and applications have been developed for its measurement and management.

Among the definitions that emphasize the presence of knowledge for competitive advantage in the market Stewart's (1997) proposed that the intellectual capital is the sum of everything that everyone knows in the company. For Edvinsson and Malone (1997) it is the possession of knowledge, applied experience, organizational technology, relations with customers and professional capacities; Sveiby (1997b) defined it as the sum of invisible assets that include the competence of the employees; for Sullivan (1998) it is the knowledge that can be converted into benefits for the future while for Bradley (1997) it is the ability to transform knowledge and the rest of intangible assets in resources generators of wealth, for both companies and countries. From a more generalist point of view, Roos, Roos, Dragonetti and Edvinsson (1997) considered it as the sum of hidden assets of a company that are not fully captured or represented on the balance sheet.

From this perspective, the Intellectual Capital covers all types of intangible assets that are the property of the company or which are likely to be used or captured in an informal manner to be deployed and mobilized to obtain superior performances (Meritum, 2002).

The change of century has brought few novelties in the definition of intellectual capital, but it is noted that the term *intangible* begins to be used increasingly, as Viedma presents it (2007) defined as the knowledge and other intangibles that create or produce value in the present and the knowledge and other intangibles that can create it and produce it in the future.

Intangible assets

They were first mentioned with an enterprise application in 1986 and they are attributed to Dicksse cited in Wu (2005), but it is up to the beginning of this century, when the issue is beginning to draw the attention of the scientific and academic community.

Upton (2001), boosts its study by criticizing the proposal for Edvinsson and Malone (1997), arguing that there are multiple factors, different from the intellectual capital that can explain this difference, as the

overvaluation of tangible and financial assets, the undervaluation of the liabilities, legal issues or temporary effects.

The concept of intangible assets has been linked to the Intellectual Capital from its initial studies, where both terms were used as synonyms. Because intangibles are constructs difficult to perceive and measure, they have only been detected via models and assessments of the intellectual capital, without reaching a consensus as to their definition although it has been suggested that their nature is based on knowledge and information (Nomen, 2005). It is in the Meritum project (2002) where differentiated definitions are proposed for both concepts.

This project defines intangibles as those non-monetary resources that can provide future economic benefits, without physical substance, controlled, or at least influenced by companies as a result of previous events and transactions, and that may or may not be identified separately from other assets

From this point of view, intangible assets are that part of the intangible or elements of the intellectual capital that can be recognized as assets depending on the existing accounting models. In this sense, the intellectual capital would be in itself an intangible asset, although not the only one.

Powell (2001) and West and DeCastro (2001) expose that the study of those factors that are not positive for competitive advantage should not be underestimated, proposal that leads to clarify that not all the intangible are necessarily assets, thus emerging the term intangible liability as the counterpart of the intangible assets (Rodríguez, 2005).

While there is a large amount of authors who point to the relationship that exists between the concept intellectual capital with the one of intangible assets of the company, another aspect of research carried out in this field by authors such as Harvey and Lusch (1999), Caddy (2000), Garcia Parra, Simo and Sallan (2006) among others, propose that the intellectual capital is calculated as the difference between the intangible assets the company owns and the intangible liabilities that it must withstand.

Intangible liabilities

The appearance of the term intangible liability is attributed to Harvey and Lusch (1999) and its development to the work of Caddy (2002), Gar-

cía-Parra, Simó, Mundet and Guzman (2004) and Simo and Garcia-Parra (2004).

These works fall into two streams; the one that presents the intangible liability as a reduction of the value of intangible assets (Caddy, 2000; Garcia-Ayuso, Larrinaga, 2004; Lozano and Fuentes, 2005), while the other, more faithful to the accounting definition of liabilities, considers them as an obligation associated to the intangible (Konar and Cohen, 2001; Garcia-Parra et al. , 2004; Garcia-Parra et al. , 2006).

The existing literature on the new concept, has been classified according to the year, perspective and objective (Table 1)

Table 1
Evaluation of the literature on intangible liabilities

Authors	***Perspective***	***Objective***
Harvey and Lusch (1999)	Obligation Reduction	Definition and Classification
Caddy (2000)	Reduction	Determine the existence of liabilities
Canibano (2001)	Reduction	Mentionitsexistence
Konar and Cohen (2001)	Obligation	Obligation - focused on the environment
Rosett (2003)	Obligation	Mention of non-monetary obligation
Porto (2003)	Obligation Reduction	Decline in the health of workers and liability of the company
Garcia-Parra, Simó, Mundet and Guzman (2004)	Obligation Reduction	Identification and analysis
Simo and Garcia-Parra (2004)	Reduction	Definition and Analysis
Viedma (2004)	Reduction	Mention its existence. Destruction of wealth
Garcia-Ayuso, Larrinaga (2004)	Reduction	Mention its existence. Less value of assets
Lozano and Fuentes (2005)	Reduction	As an element that decreases the Intellectual Capital

Source: Garcia-Parra et al. , 2006

The first approximation to the concept was proposed by Harvey and Lusch (1999) to define the intangible liability as the liability or obligation of the company to transfer economic resources or provide services to other entities in the future but it may also reflect lower returns. These

liabilities are not obligations owed to an external entity; rather, they represent a decrease in the patrimony of the shareholder that has the equivalent effect to an increase in the liabilities.

The books of intellectual capital must be balanced, if it is formed by the sum of the intangible assets of a company and if the equation that defines the equality in the Statement of Financial Position is: Capital equals to the assets minus liabilities is valid within a system of historical costs this is why it may be transpolated to Intellectual Capital:

Intellectual Capital = Intangible Assets - Intangible Liabilities

Garcia et al. (2006) note that this equation involves two implications: (1) all organizations measure their own resources recognizing and valuing the goods first and then subtracting their obligations, they also consider that if their own resources are indirectly measured by subtracting the liabilities from the assets; intellectual capital should be treated similarly. (2) If the equation above is true, then there is a need to build a new methodology to recognize and identify intangible liabilities with the purpose of preserving the balance between the elements of the balance, by which the accounting presentation would show the balance between the assets, liabilities and capital (Table 2)

Table 2
Modified State of Financial Situation

Tangible assets	*Sources of funds*
Cash Accounts receivable Inventories Property, plant and equipment	Accounts payable Long-term obligations Contributed Capital and its benefits
Intangible Assets	Financing Intangible
Human Structural Relational	Intangible Capital Intangible Liabilities

Source: Garcia Parra et al., 2006

Caddy (2000) notes that other lines of research have been opened, that allow us to describe and determine this value, considering that the potential reduction of intangible assets should be verified, which will result in a destruction of future wealth.

One of the approaches to the analysis of the loss of value of intangible assets was Andriessen and Tissen's (2000), which developed a system of evaluation and strategic management, thus limiting variables according to their value added, competitiveness, potential, sustainability, as well as robustness or vulnerability, taking into account a possible depreciation as a function of time.

It is often thought that intangible assets are depreciated over time although they usually increase their value with the use. As it has been mentioned, what organizations must reflect is in the possible loss of value of their intangible assets when a current competence becomes a mere capacity with its consequent limitation to generate competitive advantages.

In Mexico the study of intangible liabilities has been very limited, so the determination of the elements that make up the intellectual liability in a Mexican company, allows its identification, measurement and management, helping to prevent their participation in the destruction of its competitive advantage.

Model of study

The concept of market signaling is a deliberate action, positive and proactive in a company that is usually informed to the market by the media and can alert the competitors on the appropriate strategy to enter a given market being able to compete with at least the company that is sending the signal (Harvey, and Richey Lusch, 2002)

Market signals have been seen as strategies to examine and to inform and educate the market; however, they can also be counterproductive, when a situation is perceived as negative by those involved in it.

Signals can have internal or external impact in terms of the actors involved. The internal signals are owned by the organization and its employees while the external include customers, dealers and the regulations (Table 3).

Equally the signals sent may or may not be intentional. Within the first, aspects such as announcements of plant closing, product removal, cuts in labor force that are deliberate actions taken by the directors that are considered as damage control strategies because they can be explained and justified by the directors; whereas the unintentional signals are out of their control and are usually causes of strategic disasters when the directors are unable to prevent their unwanted impact on the firm.

Table 3
Market Signal Analysis

EXTERNAL	
Acquisitions	Lawsuits
Introduction of New Product	Product Recall
Higher Earnings Forecast	Lower Earnings Forecast
Technological Advancement	EPA/ Fraud Investigation
Stock Split	Misrepresentation to Costumers
	Loss of key Customers and Channel Members
PotentialImpact	*Potential Impact*
POSITIVE	NEGATIVE
Profit Sharing Program	Hiring Freeze
Benefit Program Improvement	Downsizing of Personnel
Educational Support	De-acquisition of Division
Stock Option Plan	Elimination of Bonus Program
Promotion From "Within" Policy	Reduced of Training Opportunities
INTERNAL	

Source: Harvey, and Richey Lusch, 2002

Through the signals emitted by the firm, competitors identify the information about its weaknesses and vulnerabilities to exploit them in their favor, the shareholders and customers also act accordingly, being in both cases the cause of potential intangible liabilities.

Methodology

It was designed a non-experimental, qualitative and descriptive research to determine the potential external intangible liabilities in the category of information. For this purpose a matrix to quantify, with a discretionary judgment, actions made by the companies subject to study, to determine

their possible effect on the market value of the share was developed, according to the following criteria (Table 4)

Table 4
Classification of intangible liabilities

Potential intangible liabilities	*Internal intangible liabilities*	*External intangible liabilities*
Procedural	Weaknesses in the strategic planning process Inadequate research and development Obsolete manufacturing process Lack of development of new products	Low quality of the product or service Low commitment/confidence of suppliers and distribution systems High turnover of customers, suppliers and distribution systems
Of human performance	High turnover of employees Discrimination among employees Inadequate training/development Top management lack of experience	Poor communication with customers Liability demands of the company with potential clients
Related to information	Lack of an adequate infrastructure of information Inability to convert data into information (lack of analysis)	Negative information of the product Reduction of corporate reputation Unfavorable reports of the actions carried out by the company
From the structure of the organization	Lack of flexibility in the structure of the organization Lack of patents Inadequate geographical location of the plant, warehouses	Inadequate distribution channels to reach the development Lack of strategic alliances Inefficient location to facilitate production

Source: Source: Harvey and Lusch (1999)

As indicated by Harvey, Lusch and Glenn (2002) the companies send and receive signals from the market, i.e. information about the company that can have a positive or negative balance, influencing impressions of a company's stakeholders. Sometimes these signals may be the result of a proactive strategy on part of the company, in others; they are established by others according to their perceptions of the company that influence the views of other stakeholders. Sometimes the managers of the company

are not aware of the signals sent and they often do not recognize the signals sent by others in the market.

Caddy (2000) notes that the intellectual liabilities have been determined according to the activities of the companies, who have received a certain level of negative public attention, so they must be derived by making a correlation between these news with the changes of the price of the share in the stock market. In many cases it has been found that the prices of the shares go down, however in others the companies have not had any losses in the value of their shares.

For this research two companies that were affected by negative news were selected. The first one was Televisa, the market leader in the field of television in Mexico and in Latin America. It has been affected by negative publicity related to purchase of surreptitious advertising in favor of the presidential candidate of the Institutional Revolutionary Party (PRI) Enrique Peña Nieto during the presidential elections of June 2012, as well as by the actions taken by the student group #yo soy132, that emerged as a result of a meeting between the candidate of the PRI and the community of the Universidad Iberoamericana in Mexico City, where the television company was accused by the protesters of having minimized their protest for his presence, initiating a series of activities against the company in various national and international forums.

On the other hand the subsidiary in Mexico of Wal-Mart was chosen because there were accusations on part of the American authorities, pointing out that the company paid bribes of up to $24 million to gain domination in the Mexican market, according to the information published by the North American journal New York Times.

In both cases the companies were affected by negative news, however, the effects on the price of the share were different.

Results

Televisa S.A.

The share of Televisa showed no anomaly related to the events of movement #yo soy 132, as the performance of the share during the last semester was positive with the exception of a fall during May. According to the data in table 5 the behavior of the share was as follows:

May 21st, day of the emergence of the group. The day before, the value of the share changed from 20.37 to 20.10 pesos presenting a decrease of 1.33 %. The next significant decrease was on June 6th when about twenty members of the movement #Yosoy132 demonstrated peacefully in front of the headquarters of the Federal Communications Commission (Cofetel) then the value went to 19.03, losing almost the 6.58 %. Another event which affected the value of the share was published on June 6th in the social networks, particularly on Twitter, the article "Computer files linked dirty dealings of television to the favorite candidate to the presidency of Mexico", published in The Guardian, a British newspaper, resulting in a 4.27 % decrease in the price of the share 19.50 .

From that moment on, the data related to the movement no longer had an impact in the market value of the share. On July 26th, movement #Yosoy132 and several organizations held a protest against the results of the election, which resulted in a 0.54% increase in the market value of the share, and in relation to this group the last news were analyzed on July 28th, during the live broadcast of Televisa Sports from London, on the occasion of the Olympic games, the group held a protest. At that time, the price of the share was 21.12, the share showed a rise of 14 % when compared with the price at the start of the movement; on September 14th, 2012 it was valued in 24.27, an increase of 19.50 % in the period under study. (Table 5)

Table 5
Concentrated stock market information for GrupoTelevisa
(March to September 2012)

Date	*Information*	*Classification*	*Value per share*
July 28	During the live transmission of Televisa Sports in London, on the occasion of the Olympic Games, members of the Movement #Yosoy132 broke into the place, while the TV station commentators did their job.	Negative	21.10
July 26	Members of the Movement #Yosoy132 and several organizations moved toward the facilities of Televisa Chapultepec, from the Monument to the Revolution	Negative	20.48

Date	*Information*	*Classification*	*Value per share*
June 8	This afternoon was spread through the social networks, particularly on Twitter, the article "computer files linked dirty dealings of television to the favorite candidate to the presidency of Mexico", published in the British newspaper The Guardian it generated various positions, to become Trend Topic.	Negative	19.50
June. 6	Around twenty members of the movement #Yosoy132 demonstrated peacefully in front of the office of the Federal Communications Commission (Cofetel) to demand the opening of one more open television chain and to oppose the merger Televisa-Iusacell .	Negative	19.03
May 18th.	Students of The La Salle, Iberoamericana (Ibero), Universidad NacionalAutónoma de México (UNAM), Anahuac and the InstitutoTecnológicoAutónomo de México (ITAM), rejected having a closed-door meeting with members of Televisa and demanded an open dialog, after a memeber of Televisa News, identified as Gill Begovich, came to offer a talk with four students.	Negative	20.10
May 11	There is a movement #yo soy 132 emerges as a result of the perception of Ibero's students that the PRI had pretended to refine and smooth the encounter with his candidate	Negative	20.37

Source: own elaboration with data from Infosel (2012)

The price behavior of the share shows in figure 1

Figure 1
Grupo Televisa S.A.
Comparative Historical Chart
April - September 2012

Source: Yahoo Finanzas (2012)

Wal-Mart de Mexico

This company had shown a steady growth until April's first week, an equivalent to 19% during 2012, however, on April 21st. information emerged in the American press on allegations of corruption, pointing out that the company would have spent at least $24 million to bribe Mexican officials in order to grow its domain in the market. The chain of alleged corruption included municipal presidents and municipal trustees, planners, low level bureaucrats. According to the data in table 6 the behavior of the share was as follows:

The impact was immediate in the Mexican stock market. The same week those charges were made public, the company's loses in two days surpassed the 26.6 percent, an amount higher than the revenue obtained for its sales during the first quarter of this year. Meaning its capitalization value decreased around 121 thousand 500 million pesos in currency units the first two days after the indictment was made, since the price of its shares was reduced from 43.06 pesos in which they were traded on

Friday to 36.36 pesos at the closure next Tuesday. In this same sense, on August 14th, democrat representatives of the Committee on Government Oversight in the United States House of Representatives (EU), revealed details of a new legislative investigation that continued against the operations of Wal-Mart in Mexico, where they were accused not only of bribery, but also of questionable financial conduct, including tax evasion and money laundering.

Table 6
Concentrate of information of the stock market Wal-Mart
(MarchtoSeptember 2012)

Date	*Information*	*Classification*
August 14	Elijah Cummings and Henry Waxman, democrat representatives of the Committee on Government Oversight in the United States House of Representatives (EU), revealed details of a new legislative investigation that continues against Wal-Mart operations in Mexico. "We have obtained internal documents of the company, including reports of internal audits (and) from other sources, suggesting that Wal-Mart could have had problems (...) not only of bribery, but also of questionable financial conduct, including tax evasion and 'money laundering' ", he pointed out.	Negative
June 12	A group of pension funds of New York filed a lawsuit against 27 managers and former executives of Wal-Mart accusing them of having handled improperly an alleged scheme of bribes in the largest chain of retail stores in the world.	Negative
April 23	After that the New York Times divulged the alleged payoffs that allow the expansion of Wal-Mart in Mexico, the distributor announced that it already began investigations in this regard.	Negative
April 24	Wal-Mart said this Tuesday that it will not tolerate violations of the Foreign Corrupt Practices Act (FCPA) and offered to continue to cooperate with federal authorities who are investigating the alleged bribes	Negative
April 23	The federal government clarified that it has not observed any indication of participation by federal officials in the alleged bribery carried out by the company between 2003 and 2005.	Negative
April 21	Walmart's subsidiary in Mexico paid bribes of up to $24 million to gain domination in the Mexican market, according to The New York Times.	Negative

Source: own work with data of Infosel (2012)

During the second week of September 2012 the price of the share was on average a 14.98 % below its maximum value obtained in April, just before the allegations of corruption against the company were reported in the media. The price behavior of the share can be seen in figure 2

Figure 2
Behavior of Wal-Mart -Mexico price per share related with bribes

Source : Yahoo Finanzas (2012)

Conclusions

One of the objectives of this research is to provide a complementary approach to help understand Intellectual Capital as a whole, which not only is composed of intangible assets, but is a mixture of both intellectual assets and liabilities, identifying only intangible assets does not allows the observation of the complete picture of the organization, at the respect of the operation within the organization, so it should identify and separate their physical assets from their intangible assets. In addition, it must be considered the degree of difficulty that represents the calculation of the Intellectual Capital, therefore the complexity to calculate the intangible liabilities is equivalent and eventually we should derive it the same way as in traditional accounting, it is to say, the subtraction of the Intangible assets minus intangible liabilities, must result in the intellectual capital.

Additionally, as it has already been pointed out, the existence of Intangible liabilities has been correlated with the activities of the companies that receive a level of negative attention from government authorities and public opinion, which implies a negative movement in the share price; this is the case of Wal Mart Mexico. The price of their share was affected in a significant way because of the allegations and investigations that the American government initiated as a result of the information obtained on Mexican officials and executives of that company that were caught in a corruption case on the permissions to open new stores in Mexican territory.

However in other cases the price of the share did not suffer any change, as with Televisa, which despite receiving unintentional negative signals of behavior of the company, which were outside their control, as a result of a student movement that was not considered and that potentially could have affected the value of the company, taking into account that the managers did not consider this event as well as its impact on public opinion. There are other events that could eventually reduce the impact of student phenomenon, as the transmission of London Olympics on the part of the television network, with the respective income by commercial invoicing, as well as a decision on the part of the federal authority to rescue the of 2.5 Ghz band in possession of MVS one of whose beneficiaries might be the mentioned television company.

According to what is described above, it is possible to conclude that not all businesses are affected in the same way, the negative information directly affects the value of the share, it must be considered whether this is due to the way in which the market perceives the information in the case of GrupoTelevisa, the indictment came from civil society, so that the investors felt that the allegations did not affect the operating performance of the company. On the other hand in the case of Wal-Mart the accusations came from part of the American federal authority, so there was a possible trial and eventually a punishment that would substantially affect the company's profits.

Intangible liabilities must be studied and categorized according to their impact, their possible negative effects and their duration, at both levels market and organization in Mexico. Hierarchy can be used by the organization to determine strategies that will enable it to attack the effects of this kind of liabilities and their consequences.

References

Andriessen, D. (2004). IC valuation and measurement: classifying the state of art. *Journal of Intellectual Capital*, 5(2), 230-242.

Andriessen, D. &Tissen, R. (2000). *Weightless wealth*. London: Financial Times, Prentice Hall.

Bradley, K. (1997). Intellectual capital and the new wealth of nations. *Business Strategy Review*, 8(1), 53-62.

Brooking, A. (1996). *Intellectual Capital*: *core asset for the third millennium enterprise*. London: International Thomson Business Press.

Brooking, A. (1998). *Intellectual Capital*. London: International Thomson Business Press.

Bontis, N. (1998). Intellectual capital: an exploratory study that develops measure and models. *Management Decision*, 36(2), 63-76.

Caddy, I. (2000). Intellectual capital, recognizing both assets and liabilities. *Journal of Intellectual Capital*, 1(22), 129-146.

Caddy, I. (2002). Issues concerning intellectual capital metrics and measurements of intellectual capital. *Singapure Management Review*. 24(3), 77-88

Edvinsson, L. & Malone, M.S. (1997). *Intellectual Capital: realizing your company's true value by findings its hidden brainpower*. New York: Harper Collins Publisher, Inc.

García, A. M. y Larrinaga, C., (2004). El lado oculto de los intangibles: activos y pasivos ligados a la sostenibilidad. *Revista Finanzas y Contabilidad*, 57, 34-43.

García, P. M.; Simo, P.; Mundet, J. & Guzmán, J. (2004). Intangible Assets and liabilities. *Intangible Capital*. 0(3), 70-86.

García, P. M.; Simo, P. y Sallan, J.M. (2006). La evolución del capital intelectual y las nuevas corrientes. *Intangible Assets*, 2(3), 277-307.

Grant, R. M. (1996). *Dirección estratégica: conceptos técnicas y aplicaciones*. Madrid: Civitas.

Harvey, M. &Lusch, R. (1999). Balancing the intellectual capital books: intangible liabilities. *European Management Journal*, 17(1)85-92.

Harvey, M., Lusch, R & Richey, G. (2002). Cascading negative markets signals: A case history. *American Bussines Review*. 20(2), 67-79.

Infosel (2012). Base de datos. En: http://www.infosel.com.mx/

Itami, H. & Roehl, T. (1987). *Movilizing invisibles assets*. USA: First Harvard University Press.

Konar, S. & Cohen, M.A. (2001). Does the market value environmental performance? *Review of Economics and Statistics*, 83, 281-289.

Kristandl, G. &Bontis, N. (2007). Constructing a definition for intangibles using the resource based view of the firm. *Management Decision*, 45(9), 1510-1524.

Lozano, M.C. y Fuentes, F. (2005). La importancia del intangible en la empresa de internet: una propuesta de medición contable. *Economic Analysis Working Papers*, 4, 1-62.

McClure, B. (2003). *The hidden value of intangibles*. Recuperado el 3 de enero de 2008 de: http://www.investopedia.com/articles/03/010603.

Marr, B, &Chatzkel, J. (2004). Intellectual capital at the crossroads: managing, measuring, and reporting of IC. *Journal of Intellectual Capital*. 5(2). 224-229.

Meritum (2002). *Directrices para la gestión y difusión de información sobre intangibles: informe de Capital Intelectual*, Fundación AirtelMovil.

Molbjerg, J. K. (2006). Conceptualisingintelectual capital as a language game and power. *Journal of Intellectual Capital*, 7(1), 78-92.

Navas, J.E. y Guerras, L.A. (1998). *La dirección estratégica de la empresa: teorías y aplicaciones*. Madrid: Civitas.

Nomen, E. (2005). *Valor razonable de los activos intangibles*. España: Deusto.

Powell, T. C. (2001). Competitive advantage: logical and philosophical considerations. *Strategic Management Journal*, 22(9), 875-878.

Ramírez, Y. (2010). Aproximaciones a una taxonomía del capital intelectual. *Partida doble*, 227, 61-75.

Roos, J., Roos. G., Dragonetti, C. y Edvinsson, L. (1997). *Capital Intelectual*. Barcelona: Editorial Paidós.

Rodríguez, J.M. (2005). El Capital Intelectual como la diferencia entre los activos y los pasivos intangibles. *Aula Abierta*, 28.

Simo, P. y García, P. M. (2004). Pasivos humanos: antítesis del capital intelectual. *Intangibles*, 4, 24-29.

Stewart, T. (1997). *Intellectual Capital: the new wealth of organizations*. London: Nicolas Brealey Publishing.

Sullivan, P.H. (1998). *Profiting from Intellectual Capital: extracting value from innovation*. New York: Wiley New York.

Sveiby, K. (1997a). *The new organization wealth: managing and measuring intangible assets*. San Francisco: Bernett-Koehler.

Sveiby, K. (1997b). The intangible assets monitor. *Journal of Human Resource Costing and Accounting*. 2(1), 73-97.

Ventura, J. (1996). Análisis dinámico de la estrategia empresarial: un ensayo interdisciplinar.

Viedma, J.M. (2007). In search of an Intellectual capital comprehensive theory. *Electronic Journal of Knowledge Management*, 5(2), 245-256.

Yahoo. Finanzas. (2012). Internet webpage in: http://mx.finanzas.yahoo.com/

West, G.P. & DeCastro, J. (2001). The Achilles heel of firm strategy: resource weaknesses and distinctive inadequacies, *Journal of Management Studies*, 38(3), 417-442.

Wu, A. (2005). The integration between balance scorecard and intellectual capital. *Journal of Intellectual Capital*, 6(2), 267-284.

4
Performance of websites of Mexico's tourism destinations as a factor of competitiveness

Ricardo Aguado Ornelas[1]
Gerardo Gabriel Alfaro Calderón[1]
Aníbal Gabriel Herrera Moro Valdovinos[1]

Abstract

The economic universe is divided into three key categories: primary activities (agriculture and fishing), secondary activities (mining and manufacturing) and the tertiary or services sector. In economics, the tertiary sector has become more important. In Mexico, the tertiary sector generates over 45% of total employment (INEGI, 2006) and tourism represents a mainstay of the national economy. To ensure a good performance for a website, certain criteria should be followed. This research focuses on determining the performance of the entire websites in Mexico; this research will take into account official recommendations issued by the UNWTO, the International Federation for Information Technology and Tourism (IFITT) and several investigations on e-tourism and online promotion for destination websites.The national website is the best graded, followed by Yucatán, the State of Mexico, Tlaxcala, Querétaro, Durango, Guanajuato, Nuevo León, Hidalgo and Tabasco.

---

1. Universidad Michoacana de San Nicolás de Hidalgo (Instituto de Investigaciones Económicas y Empresariales), Instituto Tecnológico de la Costa Grande.

Keywords: Web Site, Promotion, Performance, Tourism Competitiveness.

Problem statement

Printed advertising is one of the most important and effective marketing methods for the promotion of destinations. However, in the last decade, information and communications technologies (ICTS) such as the internet have become an attractive alternative for tourism promotion (Fernandez and Mihi, 2011), several companies began to invest in tourism online promotion. Internet offers the advantage to diversify and focus your advertising to specific markets.

In recent years Destination Management Organizations (DMOS), have significantly increased their investment in website development. Marketing activities through the Internet are an important element of the DMOS operational programs at a local, regional and national level.

Along with website development, organizations and educational institutions have established organisms intended to regulate, standardize and maximize the use of technology such as the World Wide Web Consortium (W3C) and the International Federation for IT and Travel & Tourism (IFITT).

W3C standards are considered hallmarks of quality in websites. However, Mexico is not attached to W3C or does not have any proper organization or association to backup its government websites with any quality distinctive or standard.

The International Federation for IT and Travel & Tourism in coordination with UNWTO have established policies to help DMOS evaluate and benchmark the quality and performance of their online activities (UNWTO, 2011).

International corporations specialized in Internet and the flow of information in the network such as Google, Alexa or the Internet Archive have developed standards to measure performance of websites in relation to variables such as traffic, popularity, speed and size among others (Google, Alexa The Internet Archive).

DMOS in Mexico often abuse of certain features on their websites making them slower and sometimes inaccessible for certain technologies such as portable devices. While DMOS should follow certain rules for their online activities, in Mexico there is a lack of official guidelines to regulate

the content of their websites. Therefore there's a risk of having a poor performance in destination websites and miss the benefits that online promotion can give.

According to the UNWTO, an evaluation of destination websites can set the tone for website improvement and better website performance making it possible for DMOS to:

- Encourage them to improve the quality of their activities and systems in the network.
- Allow a comparison of the performance of their websites with similar organizations.
- Ease cooperation between DMOS in relation to their activities on the Internet as well as encouraging them to innovate their products and services.
- Improve the understanding of the key factors influencing the effectiveness of their websites.
- Develop and implement a plan of practical services for those DMOS who wish to improve the quality and effectiveness of their online activities.

Research questions, objectives, hypothesis and variables.

With a better understanding of the current reality of Mexican DMOS' efforts to promote destinations online, several questions come through. This research attempts to explain the key factors to be considered when building a website to ensure a good performance and thus, a better presence in the Web. The following table shows the congruence matrix of this investigation.

Table 1
Congruence matrix

Performance of websites of Mexico's tourism destinations as a factor of competitiveness					
Research questions	*Objective*	*General hypothesis*	*Var.*	*Dimension*	*Indicator*
General question	*General objective*		*Dependent*		
To what degree do popularity, speed, size and feedback influence the performance of destination websites in Mexico?	Determine to what degree popularity, speed, size, and feedback influence the performance of destination websites in Mexico.	The better the level of popularity, speed, size and feedback is, the better the performance of destination websites in Mexico will be.	Performance	Level of performance	Performance scores
Specific questions	*Specific objectives*		*Independent*		
How does popularity influence the performance of destination websites in Mexico?	Identify to what degree popularity influences the performance of destination websites in Mexico.	The better the level of popularity is, the better the performance of destination websites in Mexico will be.	Popularity	Google rank, inbound links, alexa rank, no. Of languages	Obtained score Number of inbound links
How does speed influence the performance of destination websites in Mexico?	Identify to what degree speed influences the performance of destination websites in Mexico.	The better the level of speed is, the better the performance of destination websites in Mexico will be.	Speed	Speed rank	Page speed online

How does size influence the performance of destination websites in Mexico?	Identify to what degree size influences the performance of destination websites in Mexico.	The smaller the size of a website is, the better its performance will be.	Size	Web optimizer	Websitesize in bytes
How does feedback influence the performance of destination websites in Mexico?	Identify to what degree feedback influences the performance of destination websites in Mexico.	The better the level of feedback is, the better the performance of destination websites in Mexico will be.	Feedback	E-mail feedback	Obtained score
How does age influence the performance of destination websites in Mexico?	Identify to what degree age influences the performance of destination websites in Mexico.	The older a website is, the better its performance will be.	Age	Wayback machine	Age in days

Justification

In the past five decades, Mexico has made substantial achievements in the development of its tourism industry, however, it has also came upon bottlenecks, strategic errors and, possible insufficient use of all the advantages to be offered (SECTUR, 2000).

During the last decade, the arrival of international tourists to Mexico has remained constant, around 21 million people (INEGI, 2009). This shows that, despite the generally good results of Mexican efforts, there is strong international competition affecting the behavior of visitor flux gradually changing the destination demand patterns.

The online promotion represents an effective tool for destination marketing. Nowadays it is nigh impossible for hospitality operators to ignore the Internet this century (Murphy et. al., 2007). Internet has become necessary for many users to obtain tourist information. In fact in certain sectors of the population this way of obtaining information has become an essential tool in planning and organizing trips (Fernandez and Mihi, 2011).

DMOS invest heavily in the development and continuous improvement of their websites to make them attractive and easy to use (Subrat and Chavali, 2008). Internet as a marketing tool provides significant opportunities to adopt new practices to increase demand (Sharma and Aragon, 2005). DMOS as the responsible organisms for promoting destinations online should ensure the maximum utilization of ICTS. Therefore it is imperative to know how well DMO websites are performing in order to plan marketing strategies that may help overcome the stagnation of the tourism industry in Mexico.

Methodology

Dankhe (1989) classifies the types of research in exploratory, descriptive, correlational and explanatory. Exploratory studies are performed when the objective is to examine a little-studied research problem that has not been addressed before. These studies are useful for increasing the degree of familiarity with relatively unknown phenomena, learn about the possibility of conducting a more meticulous investigation on a particular context of real life, investigating problems of human behavior that can be considered crucial to identify concepts or promising variables, set

priorities for further research or suggest verifiable statements (Dankhe, 1986). They are characterized by being more flexible in their approach compared with descriptive or explanatory studies. These studies try to find as many manifestations of the phenomenon under study as possible (Hernandez Fernandez and Baptista, 1991).

This investigation is exploratory due to its very own characteristics.

- There are no previous studies that quantify the performance of tourism websites.
- It analyzes as many variables as possible to determine which variables determine a good destination website performance.
- Leaves open options or alternatives to carry out more thorough investigations on the impact of ICTS in the promotion of destinations.

Recommendations for destination website evaluation

Montero and Martin (2003) propose a guide for assessing quality of web sites based on usability of websites. This guide considers the following criteria: general information and identity, language and writing, labeling, structure and navigation, "lay-out", search, media, support, accessibility, and feedback control. While it is a useful guide for evaluating usability of a website, its generic nature makes it lack of substantial methods to quantify web content.

General aspects such as quality of the information, identity (brands, logos), ease of navigation, image inclusion, animations or video, site design and user feedback are key elements for the evaluation of a destination website (Marquez, 2006).

Nowadays the existing websites are as vast and varied as the information they contain. The methods used for assessment must retake the general recommendations for the evaluation of a portal. Chavali and Sahu (2008) suggest a methodology for evaluating destination websites. The authors argue that the effectiveness of a tourism website is based on information content, interaction and exchange functions, design, consumer-oriented promotion of products and services, ease of use, technical quality, user registration and focus promotion.

Evaluating and Improving Websites - The Destination Web Watch

The International Federation for IT and Travel & Tourism (IFITT) and the World Tourism Organization (UNWTO) established a plan to help DMOS in the evaluation and analysis of quality and performance of their online activities as well as the profitability of their investments. The plan entitled "Evaluation and optimization of Websites - The Destination Web Watch Service" assesses the following aspects:

- Accessibility and legibility
- Identity and confidence
- Personality and interactivity
- Navigation
- Ease of location and search engine optimization
- Technical performance.

This research focuses on this methodology due to the prestige of the authors. This research focuses on the quantitative indicators to assess the performance of the Mexican DMO websites. Based upon the Destination Web Watch methodology, seven variables were taken into consideration.

Assessed variables: *Popularity, Speed, Size, Feedback, Age*
Each variable was measured using diverse online features such as Google PageRank, Alexa rank, Wayback Machine, etc. Each variable and procedure to quantify it is described on Table 2.

Table 2
Researchuniverse

State	*Official URL*
0 Mexico (National)	http://www.visitmexico.com/
Aguascalientes	http://www.vivaaguascalientes.com
Baja California	http://www.descubrebajacalifornia.com
Baja California Sur	http://www.turismobcs.com/
Campeche	www.campeche.travel
Chiapas	www.turismochiapas.gob.mx
Chihuahua	http://www.ah-chihuahua.com
Coahuila	http://www.secturcoahuila.gob.mx
Colima	http://www.visitacolima.com.mx
Distrito Federal	www.mexicocity.gob.mx

State	*Official URL*
Durango	http://www.visitadurango.com.mx
Guanajuato	www.gtoexperience.mx
Hidalgo	http://www.hidalgo.travel
Jalisco	http://visita.jalisco.gob.mx
México	www.edomexico.gob.mx/turismo
Michoacán	www.visitmichoacan.com.mx
Morelos	http://www.morelostravel.com
Nayarit	http://www.visitnayarit.com
Nuevo León	http://www.nl.gob.mx/?P=turismo
Oaxaca	http://www.oaxaca.travel
Puebla	http://www.puebla.travel/
Querétaro	http://www.queretaro.travel
Quintana Roo	http://www.caribemexicano.gob.mx/
San Luis Potosí	http://www.visitasanluispotosi.com
Sinaloa	http://www.vivesinaloa.com
Sonora	http://www.sonoraturismo.gob.mx
Tabasco	http://sectur.tabasco.gob.mx
Tamaulipas	http://www.turismotamaulipas.com/
Tlaxcala	http://www.turismotlaxcala.com
Veracruz	www.veracruz.mx
Yucatán	http://www.yucatan.travel
Zacatecas	http://zacatecastravel.com

For this investigation 31 DMOs were selected, excluding Guerrero, the only DMO who doesn't have a promotional website. As well, the national promotional website was considered for this research.

Popularity

Nobody wants their webpage to appear last in the list of relevant pages for a search query. How popular a website is relates to the importance of that particular site. When one page links to another page, it is effectively casting a vote for the other page. The more votes that are cast for a page, the more important the page must be. Also, the importance of the page that is casting the vote determines how important the vote itself is (Craven, 2011). The popularity value was determined by the average

resulting from the Google PageRank, Alexa Rank, number of incoming links and number of languages.

PageRank is a numeric value that represents how important a page is on the web. To calculate the PageRank for a page, all of its inbound links are taken into account. These are links from within the site and links from outside the site. Google ranks each site giving it numbers from 0 to 10 based on PageRank algorithm. Sites that Google determines are important are those with a higher PageRank. So a link to you from a site with a PageRank of 6 is better than a link from a site with a PageRank of 3 (Switch I.T., 2011).

Several applications such as PageRank checker (http://www.prchecker.info/) or the Google Toolbar, can be consulted to verify a website's popularity or Google's PageRank. The 32 DMO websites were verified using the PageRank checker to obtain their rank.

Languages

Each website was manually and closely analyzed to verify how many different languages each website offers. While most websites offer just one or two different languages, usually Spanish and English, some other websites have more than 5 languages and some others include an embedded Google translator which allows the information on the website to be read in 53 different languages.

Speed

Page Speed evaluates performance from the client point of view, typically measured as the page load time. This is the lapsed time between the moment a user requests a new page and the moment the page is fully rendered by the browser. The best practices cover many of the steps involved in page load time, including resolving DNS names, setting up TCP connections, transmitting HTTP requests, downloading resources, fetching resources from cache, parsing and executing scripts, and rendering objects on the page. Essentially Page Speed evaluates how well your pages either eliminate these steps altogether, parallelize them, and shorten the time they take to complete. The best practices are grouped into six categories that cover different aspects of page load optimization (Google Code, 2011)

- Optimizing caching: keeping your application's data and logic off the network altogether.
- Minimizing round-trip times: reducing the number of serial request-response cycles.
- Minimizing request overhead: reducing upload size.
- Minimizing payload size: reducing the size of responses, downloads, and cached pages.
- Optimizing browser rendering: improving the browser's layout of a page.
- Optimizing for mobile: tuning a site for the characteristics of mobile networks and mobile devices.

The Page Speed Score indicates how much faster a page could be. A high score indicates little room for improvement, while a lower score indicates more room for improvement. The Page Speed Score does not measure the time it takes for a page to load.

Again, all 32 websites were analyzed using Page Speed Online, a Google tool used to retrieve website speed scores.

Size

There is a close relationship between how fast a website loads and its size in bytes. The smaller a website is in size the faster it is expected to load. King (2008) suggests that an increased site speed, reduced download rate, and improved reliability will work synergistically with those marketing methods to optimize the total effectiveness of your site. Therefore it is desirable for a promotional website to be little in size and faster in loading speed.

Website Optimization (http://websiteoptimization.com) offers a free website performance tool and web page speed analysis. The 32 Mexican DMO websites were analyzed using this tool to get their page size in bytes for the overall website as well as size information on specific features such as html files, images, javascript coding and multimedia.

Feedback (Mystery e-mail)

While it may have been possible last century, it is nigh impossible for hospitality operators to ignore the Internet this century. Although operators seem to emphasize websites, they should also consider the most popular

Internet application, email. Email provides a unique opportunity for personalized and intimate interactions with guests, thus enhancing customer relationships (Murphy et. al., 2007).

Murphy et. al. (2003) based on past organizational research and industry sector innovations, suggests new metrics for measuring Internet adoption focusing on e-mail interaction. This metrics were used to measure the relation between e-mail feedback and website performance.

A fictitious e-mail account was created for Steven, a 27 year old potential tourist living in Toronto, Canada. Steven contacted each DMO in Mexico using a Yahoo Canada e-mail @yahoo.ca. The following information was requested.

- The most representative destinations for each state
- Contact for English spoken tourism offices
- Information about English spoken activities.
- Recommendations to be considered before visiting the state (security, currency, health or any other).
- Any other useful website to be considered.

Age (Wayback Machine)

The Wayback Machine is part of the Internet Archive (www.archive.org), which amasses websites, moving images, texts, audio, and recently, educational resources. The archive contains snapshots of over 55 billion web pages—more information than in any library including the US Library of Congress—even though archiving began only in 1996. The archive adds about 20 terabytes (1012 bytes) of digital content monthly.

Via the WM, users can view the original version of each site, as well as the dates and content of subsequent updates. To call up archived websites, users type the URL of the desired site into the address box on the WM homepage. The WM then returns the date of original site creation, number and date of site updates, and links to archived sites (Murphy et. al., 2007).

Using the Wayback Machine, all the DMO websites were analyzed. Some websites are relatively new and thus, the Wayback Machine throws information on how old that particular domain is. For these cases, the DMO was contacted to verify if there was a previous website and access the previous domain into the Machine to retrieve a more accurate date.

Results

Va. Overallresults

Table 3
Found indicators

DMO	*Age in days*	*Google PageRank*	*Alexa*	*Inbound links*	*Google Speed*	*Size*	*Languages*	*Feedback*
Mexico (National)	4468	7	50984	2795	51	1089037	8	Yes
Aguascalientes	3627	5	226321	622	30	2546134	8	No
Baja California	3070	5	518365	152	65	1639370	2	No
Baja California Sur	516	4	2837469	15	79	1297236	1	No
Campeche	1565	5	580864	66	46	1014188	2	No
Chiapas	3497	5	148188	154	39	289962	2	No
Chihuahua	3896	5	1187367	56	65	845296	3	No
Coahuila	1967	4	3053308	37	84	638992	1	No
Colima	3996	4	1980713	91	44	1986101	2	No
Distrito Federal	4769	6	186240	580	68	1551368	53	No
Durango	N/A	5	3608453	49	79	131829	3	No
Guanajuato	1897	6	457889	31	92	717543	1	No
Hidalgo	2227	4	183026	50	88	914210	1	No
Jalisco	3966	5	29502	1497	54	2071307	2	No
Mexico (State)	1645	5	98343	603	89	342624	2	No
Michoacán	3382	5	754800	127	70	1399318	1	No
Morelos	3610	5	1334921	130	67	489909	1	No
Nayarit	3361	4	2986293	42	49	492884	1	No
Nuevo León	2248	5	53246	999	68	840470	2	No
Oaxaca	1753	5	1030008	104	35	442763	2	No
Puebla	1468	3	908137	22	50	261601	5	No
Querétaro	1774	5	728052	174	25	907393	2	Yes
Quintana Roo	2229	4	699285	61	55	3012004	2	No
San Luis Potosí	3837	5	779422	89	82	1020921	2	No
Sinaloa	1967	4	3179135	43	75	306628	1	No
Sonora	4138	5	1145889	230	39	7218672	2	No
Tabasco	3383	3	529173	427	59	3024069	1	Yes
Tamaulipas	3924	4	2292681	6	66	1014176	1	No
Tlaxcala	337	4	2707310	9	84	1096655	1	Yes
Veracruz	1882	6	44765	786	55	1114182	53	No
Yucatán	1540	5	1509117	102	89	1164983	2	Yes
Zacatecas	337	4	1363	925	62	2361767	1	No

Table 4
Basic statistics for indicators used in this research

	Range	*Average*	*Median*	*Mode*
Websiteage in days	337 - 4769	2654	2248	337
Incoming links	6 – 2975	346	102	-
Alexa Rank	1363 – 3608453	1119707	741426	-
Google page rank	3 – 7	5	5	5
Number of languages	1 – 53	5	2	2
Google speed score	25 - 92	63	65	39
Size	131829 - 7218672	1351362	1017554	-

Table 5
Overall results

	Estado	*Popularity*	*Speed*	*Size*	*Mystery E-mail*	*Total*
1	Mexico (National)	6.9	5.1	4.7	10	6.7
2	Yucatán	3.3	8.9	3.8	8.6	6.2
3	Mexico (State)	5.5	8.9	8.8	0	5.8
4	Tlaxcala	1.7	8.4	4.4	7.3	5.5
5	Querétaro	4.4	2.5	6.3	7.3	5.1
6	Durango	2.2	7.9	10.0	0	5.0
7	Guanajuato	3.7	9.2	7.2	0	5.0
8	Nuevo León	5.9	6.8	6.9	0	4.9
9	Hidalgo	3.8	8.8	5.9	0	4.6
10	Tabasco	4.3	5.9	0.6	7.7	4.6
11	Morelos	3.6	6.7	8.1	0	4.6
12	Sinaloa	1.8	7.5	9.1	0	4.6
13	Chiapas	5.0	3.9	9.4	0	4.6
14	Veracruz	8.6	5.5	4.1	0	4.6
15	Coahuila	1.8	8.4	7.5	0	4.4
16	Distrito Federal	7.8	6.8	2.8	0	4.4
17	Puebla	2.4	5	9.7	0	4.3
18	San Luis Potosí	3.6	8.2	5.0	0	4.2
19	Chihuahua	3.1	6.5	6.6	0	4.1
20	Oaxaca	3.7	3.5	8.4	0	3.9
21	Nayarit	1.9	4.9	7.8	0	3.7
22	Michoacán	4.0	7	3.1	0	3.5

	Estado	*Popularity*	*Speed*	*Size*	*Mystery E-mail*	*Total*
23	Tamaulipas	1.7	6.6	5.6	0	3.5
24	Campeche	3.9	4.6	5.3	0	3.5
25	Baja California	4.6	6.5	2.5	0	3.4
26	Zacatecas	5.8	6.2	1.6	0	3.4
27	Jalisco	6.2	5.4	1.9	0	3.4
28	Baja California Sur	1.7	7.9	3.4	0	3.3
29	Quintana Roo	3.5	5.5	0.9	0	2.5
30	Aguascalientes	5.5	3	1.3	0	2.5
31	Colima	2.9	4.4	2.2	0	2.4
32	Sonora	4.1	3.9	0.3	0	2.1

Conclusions

A good destination website performance goes beyond subjective recommendations such as 'attractive photos' or 'catchy names'. Several other factors such as programming and minding 'heavy' files must be considered. In order to attract international visitors, having several languages is recommended, this is not a synonym for tough work. Websites such as Distrito Federal and Veracruz are a proof of it. With a simple Google translator gadget installed, their contents are available in 53 different languages.

No significant relation was found between the size of a website and the loading speed, several other factors such as servers, bandwidth, and internet service providers must be considered by Google to grade loading times. The fastest websites are not necessarily the smallest in size. Therefore it is recommendable for websites to also consider hosting servers and coding to ensure a better performance.

E-mail is still the most popular media online. The 5 DMOS who answered the fictitious e-mail appear in the top ten performance rates. Therefore it is strongly recommended for all destination websites to include an e-mail address in their websites. Little studies have shown that having an online contact form is better, but it is definitely helpful to do things in the least possible amount of clicks. Opening an e-mail software by clicking on a link represents a longer way than just typing the message in the same site.

Only 2 of the top ten evaluated websites fall into Rogers' early adopters category. This suggests that there's no relation between how old a website is and its performance. On the contrary, leapfrogging theory can explain why recent websites have reached their previous competitors in terms of performance.

Building a website from scratch using available features in the Web 2.0 may explain why, newer sites show better performance. Therefore hypothesis 5 is rejected.

In summary, DMOS should publish well programmed websites, allowing users to view information in different languages, stick to new Gadgets and be always opened to any form of interaction with users.

References

Alexa 2011 www.alexa.com

Arbildi, I., (2007). Posicionamiento en buscadores: una metodología práctica de optimización de sitios web. El profesional de la información. 14(2), 108-124.

Asociación para el Progreso de las Comunicaciones APC, (2011). Proyecto "Monitor de Políticas de Internet en América Latina y el Caribe". Informe inicial sobre políticas de internet en México. [revista online] disponible en http://lac.derechos.apc.org/investigacion/tic_Mexico.pdf

Asociación para la Investigación de Medios de Comunicación (AIMC), (2011). Audiencia de Internet EGM. Disponible en http://www.aimc.es

Banco Mundial (2010), [base de datos]. Washington, DC.: Usuarios de internet. Recuperado el 20 de octubre de 2010 de http://datos.bancomundial.org/indicador/IT.NET.USER

Barnes, J.G., Cumby, J.A., (2002). Establishing customer relationships on the Internet requires more than technology. *Australasian Marketing Journal* 10 (1), 36-46.

Barwise, P., Hammond, K., (1998). Predictions: Media, London, Phoenix.

Berners-Lee, T., Miller, E. (2002). Semantic web lifts off. ERCIM NEWS [revista online]. Consultado el 22 de mayo de 2011. Disponible en http://www.ercim.org/publication/Ercim_News/enw51/berners-lee.html

Brown, J. S., Duguid, P., (2000). The Social Life of Information. Boston: Harvard Business School Press

Caywood C., (1995). Library Selection Criteria for WWW Resources. Consultado el 20 de junio de 2011. Disponible en http://www.keele.ac.uk/depts/aa/landt/lt/Internet/criteria.htm

Chavali, K., Subrat, S. (2008). Comparative Study of Tourism Websites in India - With special reference to South India. *Conference on Tourism in India – Challenges Ahead*.

Chavali, K. y Sahu, S. (2008). Comparative Study of Tourism Websites in India - With special reference to South India. *Conference on Tourism in India – Challenges Ahead*, 15-17 May 2008, IIMK

Codina, L. (2004). *Posicionamiento web: Conceptos y Ciclo de vida*. [revista online] Consultado el 19 de enero de 2011. Disponible en http://hipertext.net

Consorcio World Wide Web w3c. Consultado 17 de junio de 2011. Disponible en http://www.wrc.org

Cooke, A. (1999). *Authoritative Guide to Evaluating Information on the Internet*. Neal-Schuman Publishers. New York

Coulthard, L. J. M. (2004). A Review and Critique of Research Using SERVQUAL. International Journal of Market Research, 46(4), 479-497.

Craven, 2011 http://www.webworkshop.net/pagerank.html

Danhke, G. (1989). Investigación y comunicación. McGraw-Hill. México

Fernández, E., (1996). Innovación, Tecnología y Alianzas Estratégicas. Ed. Civitas. Madrid, España

Fernández, V., Mihi, A. (2011). New campaigns of tourism promotion and marketing. The importance of specialization in the image of European brochures. Economics and management. No. 16 pp. 1225 - 1230.

Hassan Montero, Yusef y Martín Fernández, Francisco J. (2003). Guía de Evaluación Heurística de Sitios Web. En: No Solo Usabilidad, nº 2, 2003.

Hassan, F. Martín, F., (2003). Qué es la accesibilidad web. No sólo usabilidad. [revista online] Consultado el 11 de marzo de 2011. Disponible en http://www.nosolousabilidad.com/articulos/accesibilidad.htm

Hernández, P., (2007). *Tendencias de Web 2.0 aplicadas a la educación en línea. No sólo usabilidad* [revista online]. Consultado 18 de marzo de 2011. Disponible en http://www.nosolousabilidad.com/articulos/web20.htm

Hernández, R., Fernández, C., Baptista, P., (1991). *Metodología de la investigación*. México: McGraw-Hill.

Instituto Nacional de Estadística y Geografía – INEGI (2008). *Cuenta Satélite del Turismo Mexicano Edición 2008*. Aguascalientes, Ags.

Instituto Nacional de Estadística y Geografía – INEGI (2010), [base de datos]. Aguascalientes, Ags.: Dominios .mx: Dominios .mx registrados en México, 1991 a 2010. Recuperado el 3 de enero de 2010 de http://www.inegi.org.mx/sistemas/sisept/default.aspx?t=tinf136&s=est&c=19379

Jiménez Piano, M., (2001). Evaluación de sedes web. *Revista española de documentación científica.*24, 405-429.

King, Andrew B., Website Optimization: Speed, Search Engine & Conversion Rate Secrets. O'Reilly. UnitedStates.

Majó, J., Galí, N., (2002). Internet en la Información Turística. *IV Congreso "Turismo y Tecnologías de la Información y las Comunicaciones"* TuriTec. España.

Márquez Correa, M. (2006). Guía para evaluación experta. *Icon Media Lab.* http://www.jmarquez.com/documentos/jm_checklist.pdf Recopilado el 20 de junio de 2011

Montoya Suárez, O. (2004). *Schumpeter, Innovación y Determinismo Tecnológico*. Pereira, Colombia.; Universidad Tecnológica de PereiraCita de desenvolvimiento económico.

Murphy, J. and Gomes, L. (2003). E-Mail Customer Service by Australian Educational Institutions. *Australasian Marketing Journal*, 11(2), 56-69.

Murphy, J. and Tan, I. (2003). Journey to Nowhere? E-mail Customer Service by Travel Agents in Singapore. *Tourism Management*, 24(5), 543-550.

Murphy, Jamie; Hashim, Noor Hazarina and O'Connor, Peter (2007). "Take Me Back: Validating the Wayback Machine," *Journal of Computer Mediated Communication*, 13(1).

Murphy, J.;Schegg, R. and Olaru, D. (2007). Quality Clusters: Dimensions of Email Responses by Luxury Hotels. *International Journal of Hospitality Management*, 26(3), 743-747.

Nielsen, J. (2001). Did poor usability kill E-commerce?.[revista online] disponible en http://www.useit.com/alertbox/20010819.htm

Nielsen, J. How Users Read on the Web, (1997). Alertbox. Consultado el 21 de enero de 2011. Disponible en http://www.useit.com/alertbox/9710a.html

Nielsen, J., (2000). *Usabilidad. Diseño de sitios web*. Madrid: Prentice Hall.

Oliveira, P., Pais, A. (2010). *Use and perception of the internet as a marketing tool to promote rural tourism.* Universidad Da Beira Interior. Covilha, Portugal

Organización Mundial de Turismo. *UNWTO WorldTourismBarometer*. (2010) Madrid, España.: Organización Mundial de Turismo (OMT) http://www.unwto.org/facts/eng/pdf/barometer/UNWTO_Barom10_2_en.pdf

Oser, J, Blanchefield, W. C. (1980). *Historia del pensamiento económico*. Primera edición, Editorial Aguilar S.A. de C.V.

Parasuraman, A., Zeithaml, V. A., &Malhotra, A. (2005). E-S-QUAL: A Multiple-Item Scale for Assessing Electronic Service Quality. *Journal of Service Research*, 7(3), 213-233.

Pollock, A. (1998). Creating intelligent destinations for wired consumers. *Information and ComunicationTecnologies in Tourism.* Wien: Springer-Verlag. 234-247.

Real Academia de la Lengua. Diccionario de la Lengua Española. Vigésima segunda edición. [sede web]; Consultado: 20 de junio de 2011. Recuperadode: http://www.rae.es

Robinson, Les., (2009). A summary of Diffusion of Innovations. Enabling Change. http://www.enablingchange.com.au/Summary_Diffusion_Theory.pdf

Rogers, E.M., 1995. Diffusion of Innovations (4th ed). New York, The Free Press.

Secretaría de Turismo SECTUR(2002). *Impacto de las Tecnologías en el Turismo Mexicano*. México, DF.

Serrato García, M. A., Tello Contreras J. M., García Moreno, S. A., Castillo Munguía, J.C. (2009). *PERFITUR 2008. Perfil del Turista que Visita el Estado de Michoacán*. Morelia, México.; Centro de Investigación de Estudios Turísticos. Tecnológico de Monterrey.

Serrato G. M. A., Tello C. J. M., García M. S. A., Castillo M. J. C., (2010). *ICTEM 2010. Índice de competitividad turística de los estados mexicanos*. Morelia, México.; Centro de Investigación de Estudios Turísticos. Tecnológico de Monterrey.

Sharma, S., Aragón, C. J., (2005). Corporate Environmental Strategy and Competitive. In Sharma, S. & Aragón, C. J.A. (Eds.). *Environmental Strategy and Competitive Advantage*. Northhampton.Advantage: A Review from the Past to the Future

Sullivan, A., Steven S., (2003). *Economics: Principles in action*. Upper Saddle River, New Jersey 07458: Pearson Prentice Hall.

Switch I.T., 2011 http://www.switchit.com/news/improve-pagerank.asp

Tomaél, M. et. al. (2001). Evaluación de fuentes de información en internet. criterios de calidad. *Ciencias de la información*, 32, 34-45.

Valotto, G. (2011). La evolución en la consideración económica del sector servicios. Contribuciones a la Economía. España.

Varela Tavares, P., Kretzer, J., Medeiros, N. (2005). EconomiaNeoshumpeteriana: expoentesevolucionários e desafios endógenos da indústria brasileira. *Revista de Economía - ensayos*. Instituto de Economia da Universidade Federal de Uberlândia. Disponible en línea en http://www.ie.ufu.br/revista/default.asp. Recuperado el 19 de enero de 2011

Visitingmexico.com.mx, *Turismo Cultural en México: Michoacán y Guanajuato, ejes del turismo cultural de Calderón.* (2011) México. http://www.visitingmexico.com.mx/blog/turismo-cultural-en-Mexico-michoacan-y-guanajuato-ejes-del-turismo-cultural-de-calderon.htm. Recuperado el 17 de junio de 2011

Yusef H. (2004). Diseño Web Centrado en el Usuario: Usabilidad y Arquitectura de la Información. Hipertext net. 2

5
Customer satisfaction model in the restaurant industry in Guadalajara's metropolitan area

Oscar Alejandro Espinoza Mercado[1]
José Sánchez Gutiérrez[1]
E. Georgina González Uribe[1]
Juan Mejía Trejo[1]

Abstract

Customer satisfaction is considered as the most researched measurement in marketing (Gupta and Zeithaml, 2005). Many researchers consider it as an important way to measure both, outcomes and quality. It may even be said to have had an impact even in today's competitive environment, since it is a basis for making comparisons among several organizations (Paula, Long, R. and Weiner, 2002). In these terms, the ability to satisfy customers is vital for a number of reasons, especially in the restaurant industry.

Keywords: Customer satisfaction, Restaurant industry, Quality.

1. Centro Universitario de Ciencias Económico Administrativas - Universidad de Guadalajara

Introduction

An important factor in the decision to carry out this research is the fact that in recent years the restaurant industry has been considered as a good option for businesses with great potential for success for entrepreneurs and it also generates good profits due to the ascent of it. Large percentage of the family budget goes to eating out, having a great demand in this segment, but even though this type of business covers a basic necessity for the market there is always a high percentage of new restaurants fail in their first months or years of operation.

Research as mentioned above is focused on the customer, who is able to obtain precise answers in order to facilitate the interpretation and analysis of satisfaction. Furthermore, this study is due to the large number of dissatisfied customers whose desires and expectations are not covered in its own way, so it is important to identify the determinants involved in its sole satisfaction perception and thus to be searchable assessment solutions that improve the experience rendered concerning the restaurant industry in the metropolitan area of Guadalajara. It is therefore necessary to consider both perception and customer satisfaction in the industry, as this depends on their performance.

The purpose of this research is to identify some of the determinants of customer satisfaction in the restaurant industry in the Metropolitan Zone of Guadalajara Thus, some determinants of customer satisfaction have been widely discussed in the service quality, expectations, performance, disagreement, desires, affection and action (Churchill and Suprenant 1982, Oliver 1993, Patterson et al. 1997; Spreng, et al 1996).

Theoretical Framework

Quality

Returning to the roots and very classic based on research, satisfaction is also conceived as the result once the characteristics of the product or service to meet customer needs. It is when the company exceeds customer expectations (Juran 1981). On the other hand, and with another approach, Jones and Sesser (1995) suggested that the simple act of providing something unique may be the only reliable way to achieve true customer satisfaction. As described, the companies must realize that dif-

ferent actions make the difference between a neutral and a satisfied customer and a very happy one satisfied.

Food quality

Nowadays, carrying out a good food choice is crucial, especially for those consumers with a healthy lifestyle, seek to consume only products of high nutritional value. Certainly, consumers are looking for quality, value and desirable environment away from the everyday pressures (Soriano, 2002). Having a certain purchasing power and an educated society, today's consumers demand higher food quality.

Thus, factors such as safety, freshness, storage, preparation, consumption, price, packaging, and place of purchase are the ones that can create trends in consumer purchasing behavior. Both the quality and safety are important elements in consumer perception regarding decisions related to food choice (Grunert, 2005, Rohr et al., 2005). As a matter of fact, among the four factors that are taken into consideration in the present study, the price is not the primary factor with respect to the consumer, so it is important to mention that those who are able to serve good quality food always know how to keep a customer satisfied. However, consumers are always looking for a reason to make it worth it (Klara, 2001).

Quality Service

Although it is difficult to define "quality service," marketing theory has recently conceived it as something personal and subjective, where customer perception is essential. Consequently, the most common definition of service quality specified by the customer overall judgment regarding the superiority of the service (Parasuraman, Zeithaml and Berry, 1988), takes into account the service that the customer expects to receive and the perception of company that offers this service (Grönroos, 1994; Parasuraman, Zeithaml and Berry, 1985).

According to the contribution of Cronin and Taylor (1992) the service quality is an antecedent of customer satisfaction, which in turn, affects the purchase intentions. Consumer satisfaction also increases the value for the restaurant industry (Anderson, Fornell, and Mazvancheryl, 2004). In fact, this applies to any industry. This study focuses primarily on the restaurant industry, which is meant to provide a better service and value (Stevens, Knutson, and Patton, 1995).

At the time the quality of service perceived by the client is reached or even exceeded, dissonance happens, or rather, a confusion regarding the use of the term "satisfaction" due to the similarity in the meaning of these two elements. Both are highly interconnected (Cronin, Brady, and Hult, 2000; Spreng and Mackoy, 1996), but still differ in some respects (Bansal and Taylor, 1999, Oliver, 1980).

Environment

In marketing, Kotler (1973, p. 50) defines "atmosphere" as "... design media buying to produce specific emotional effects in the buyer that enhances a purchase probability". Arnould (1998, p. 90) defines it as "consciously designed places, calculated to produce commercially significant actions". Added to the definition, Babin and Attaway (2000, p. 93), the setting "evokes emotions that help to determine the value and this value motivates customers to patronize a choice repeatedly."

The setting has been defined as "the effort to design buying environments to produce specific emotional effects in the buyer that enhances a purchase probability" (Kotler, 1973, p. 50).

The main sensory channels for the environment are sight, sound, smell and touch (Kotler, 1973, p. 51). In a review of the literature on the environment, Turley and Milliman (2000) designed a "whole interior" that includes music, sound, lighting, odor, color, temperature (often referred to as "environmental cues"), and visual design elements. It is generally accepted that the terms "atmospheric environment" was coined by Kotler (1973) was the first to document the influence of the environment in the process of customer perception (cf. Turley and Milliman, 2000, p. 193-211), which leads to the buying / not buying decisions.

Based on early research in environmental psychology, Kotler (1973) took a narrower approach on consumer behavior and the impact that the physical environment has on it. He said that customers perceive the environment through a combination of visual (color, lighting, proximity and the number of visual elements), hearing (kind of music, sound level), tactile (cleaning) and olfactory (smell), the signals present in the service environment.

Ezeh and Harris (., 2007, p 59), noted that there was a disconnection between the use of nonverbal cues.

Price

We all make purchasing decisions on a daily basis. These consumption decisions, which often include the choice of the brand, are often influenced by a variety of internal and external stimuli such as a dreadful reaction to the amount of advertising efforts that we are exposed to (Bawa, Srinivasan and Srivastava, 1997), and the answer to this kind of advertising (Soman, 1998; McCall, Eckrich, and Bruneau, 2007).

Due to all these dynamics, traders have always been interested in how consumers react to changes (large and small) in the marketing environment. Raymond Corey from Harvard Business School, once proclaimed that all marketing efforts are focused on reaching the pricing decision (Nagle and Holden, 2002). Given the importance of price, this part of the study examines the role of perceived value, quality, price and knowledge applied to price sensitivity.

Nowadays, restaurants are increasingly turning to a variety of marketing strategies to remain viable, including brand extensions in frozen foods, among others. The price sensitivity has been an important issue for marketers and it is a particularly important factor in the restaurant business industry. As the opening quote suggests, casual dining, including restaurants in general, depend on consumer choice. Moreover, the opening quote also offers a major reason for concern among restaurateurs. Casual dining is often an option hedonistic compliance driven by the needs and desires of consumers (Wakefield & Inman, 2003).

Methodology

The current study took into account random customers from restaurants in certain areas of the GMA, Jalisco. Such information is about perceived quality food (freshness, doneness, color, aroma, texture, flavor, to the type of furniture, comfort, space between the tables, design, decoration and others.

Research techniques that were conducted are: Documentary, which was necessary theoretical information collectedto carry the study out: Secondary sources (Databases) articles, journals and books. Systemic observation, interviews and questionnaires, which were obtained to carry out an accurate assessment. Quantitative research provides the alternative to generalize results, providing control and magnitudes.

Measuring Instrument

To incorporate validity, the questionnaire was developed based on the structure of this study having been adequately adapted from som other used ones in previous studies by scholars in this field (Dube et al, 1994; Lee and Hing, 1995; Stevens et al, 1995; Oh, 2000; Choi and Chu, 2001; Yüksel and Yüksel, 200). To measure satisfaction regarding food quality, service, price and atmosphere, Likert scale of 5 degrees in the questionnaire in 8 different sections was primarily used (Table 1).

Table 1
Measurement Instrument Struscture

Section	*Ítem*	*Measurement concept*
Section A	Ítems 1 - 4	Demographics
Section B	Ítem 5	Reason to choose a Restaurant
Section C	Ítems 6 - 23	Food quality
Section	Ítems 4 – 49	Service
Section	Ítems 50 – 72	Environment
Section F	Ítems 73 - 75	Price
Section G	Ítems 76 - 78	Importance regarding offers
Sección H	Ítems 79 - 85	Overall satisfaction

Source: Based on survey data.

For data collection, we used a questionnaire based on Likert scale with five listed alternatives ranging from 1 to 5, being 1 the lowest satisfaction and 5 the highest.

Totally unsatisfied	Unsatisfied	Indifferent	Satisfied	Totally satisfied

Hypothesis

H1. The higher the personal attention to clients, the better satisfaction experience.
H2. The greater price importance, the higher perceived satisfaction experience.
H3. The greater importance regarding food and drinks, the greater customer satisfaction.

Quantitative analysis

Chi-square test

Testing goodness of fit between the observed distribution and the expected distribution of a variable (Mc Daniel, 2007). This test is designed to compare over X squared statistic, the differences between the observed frequencies in a distribution of a variable and expected because of a hypothesis (Table 2).

Table 2
KMO & Barlett Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.765
Bartlett's Test of Sphericity	Approx. Chi-Square	1750.874
	DF	304
	Sig.	.000

Source: Own elaboration.

The reliability test (Table 3) gives a figure of 745 in the questionnaire to be applied, indicating that it explained 74.5% of the research.

Key Drivers Analysis

The previous analysis of Pearson correlations allow a more detailed and comprehensive study. This study is useful to determine the actual satisfaction of respondents with respect to the dependent variable, specifying the accurate location of each variable that occupies in the dispersal graph, which depicts a classification based on their degree of correlation and performance.

Table 3
Key drivers' quadrants

Quadrant	*Location*	*Interpretation*
High Influence / High Performance	Upper right	Competitive (key strengths) – desired position. High quality serviceand satisfaction.
High Influence / Low Performance	Upper left	Opportunities (key weaknesses) – Areas of opportunity. Do not perform well in things that most likely impact there purchase
Low Influence / High Performance	Lower right	Hygienic (potential drivers) – They do not increase repurchase, but leave them behind would make a difference.
Low Influence / Low Performance	Lower left	Transparent (low priority) – should remain so given the conditions.

Source: Own elaboration.

Graphic 1 shows the general behavior that every variable occupies in relation to "total satisfaction level regarding the quality of service" (dependent variable). It is necessary to note that the graphic is divided into quadrants.

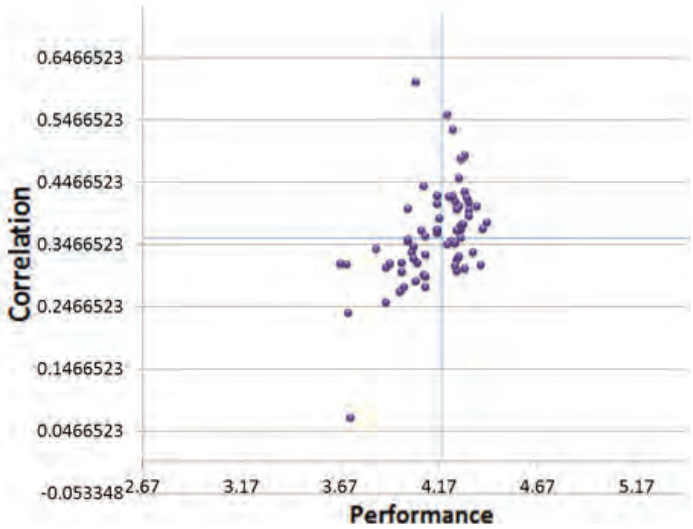
According to Graphic 1, the level of performance was substantially higher, since mostly scattered points corresponding to each of the variables, are loaded on value 5 (considering that the midpoint of the graphic was set according to the values given).

It is remarkable that most variables mainly agglutinate in two quadrants: transparent and competitive. While hygiene and opportunity show slightly fewer. To make a more objective judgment of the location of such variables, a segmented analysis is performed in order to identify which variables occupy each point on the graphic.

Hygienic variables

As far as it goes to Graphic 2, the hygienic variables are concentrated in a fairly concentrated area so they all maintain a certain correlation degree and similar performance. This quadrant turns out to be quite important as it defines attributes that have a high degree of performance, and in the case of this study, a nearly packed correlation. The higher correlation, the greater impact on service quality is experienced.

Graphic 1
Key drivers



Source: Based on survey data.

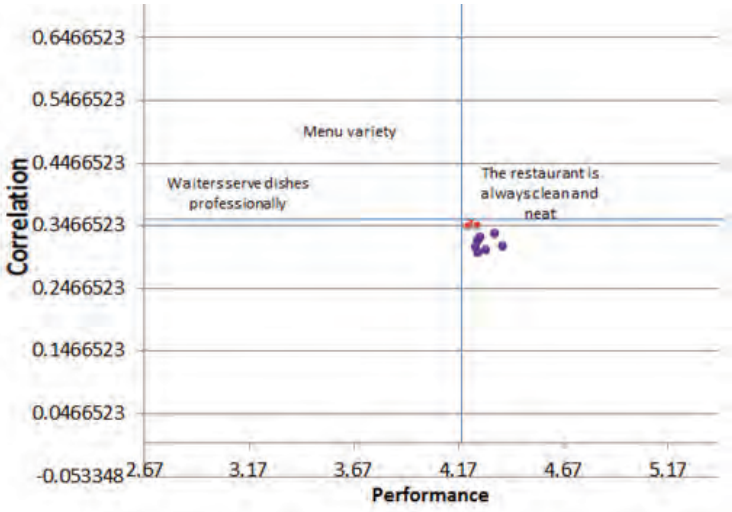
In fact, the attributes are actually considered basically expected. This means that although their presence is not crucial in the rendering of the service, the absence of them could negatively affect the level of satisfaction.

As shown in Graphic 2, there are three attributes that were marked in red and slightly line the limit of the quadrant which corresponds to the competitive attributes, and turns out quite interesting because with a little effort they could become competitive ones.

- The restaurant is always clean and neat
- Variety of drinks on the menu
- Waiters serve food professionally

As for the other attributes, since they maintain high enough correlation degrees and performance, as well as their location, they provide a considerable level of satisfaction. Graphic 3 defines the variables considered "transparent," which are slightly broader than the others. It should also be noted that this is just the quadrant that has a greater number of variables, since 23 of them are located right there.

Graphic 2
Hygienic variables



Source: Based on survey data.

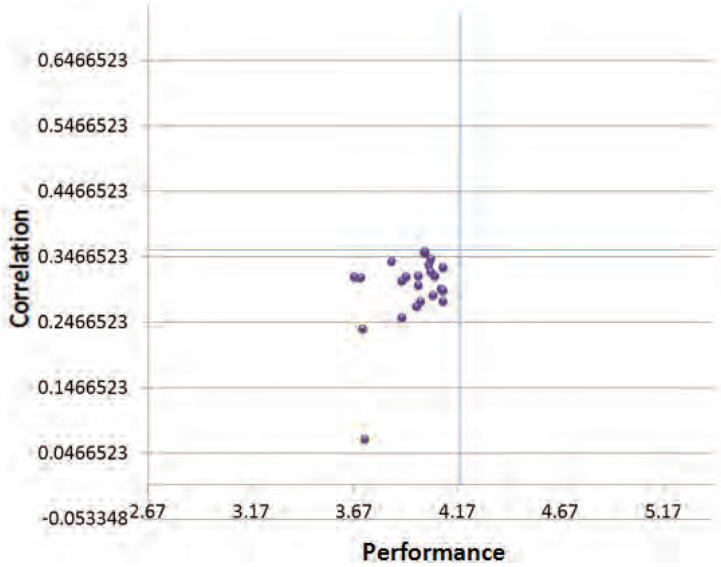
Transparent variables

Meanwhile, graphic 4 defines the variables considered as "opportunities", which are dispersed in a very small area, as well as hygienic. Unlike the quadrant corresponding to the transparent, which only has 10. However, not being a minority means that they have less value, in fact, such variables are found to be of great interest, as those that can work in order to provide better customer satisfaction, due to their high correlation degree. Hence, attributes marked in red (bordering the competitive limit) are those with a small improvement in performance that could be considered "competitive."

- The service is fast
- Settlement of inputs and outputs
- Variety of food on the menu
- All food and drinks are in stock
- Odor

This will increase the reasons that a customer will have to experience a high satisfaction level. Five attributes are expressed in red in the Graphic 4 in descending order for a better understanding.

Graphic 3
Transparent variables

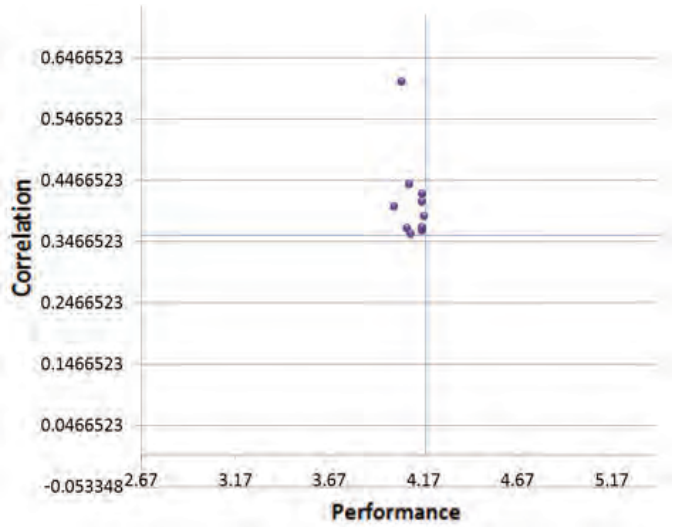


Source: Based on survey data.

Opportunity variables

These variables represent all the potential the industry has to enhance with a slight effort. It means that they can easily switch from opportunity to competitive by adding a bit more importance, since they considerably satisfy customers. As a matter of fact, 5 of these items nearly touch the borderline between such quadrants, hence, they are about to be competitive ones (Graphic 4). By taking a closer look at this graphic, it is easy to realize how close these items are from being reasons to visit a restaurant.

Graphic 4
Opportunity variables



Source: Based on survey data.

Competitive variables

Finally we present the quadrant that defines "competitive" attributes, which according to the degree of correlation, are considerably higher. This quadrant has 21 variables that seem to overlap because of their similar location. The study is quite benign, as it shows that there are 21 variables denoting that if customers are satisfied, is largely due to these attributes. The four attributes marked in red are those with higher degree of correlation and thus, are the ones which exercise more power.

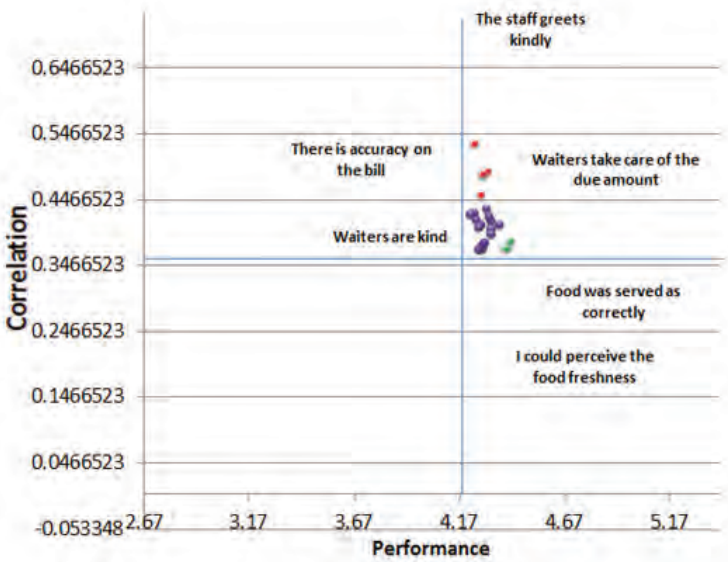
- The staff greets you kindly
- Staff provides accurate billing
- Staff provides change accurately
- The staff is friendly / courteous

On the other hand, attributes marked in green are those whose performance were unmatched, attributes relative to the primary endpoint of

this study (quality of service), proved to have a very important performance.

- Their food was properly served
- Food freshness

Graphic 5
Competitive variables



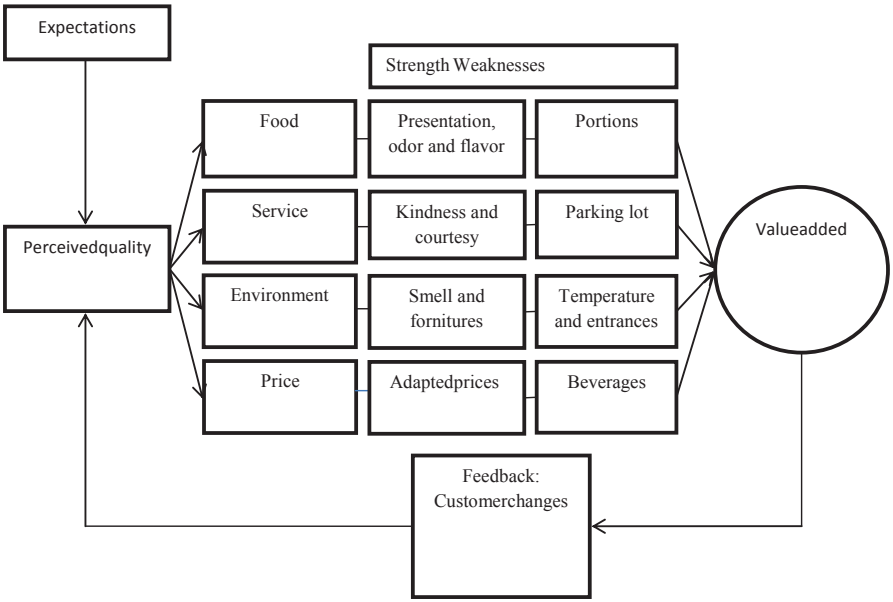
Source: Based on survey data.

Customer satisfaction proposal

Improving the quality of any aspect involves the fact that it exceeds expectations, either by improving product attributes per se, or by providing added value. In any case, it seeks to foster a reason to choose a specified product from the others.

Under this scheme, an idea that comes up as a model of satisfaction is displayed. It works as a guide that provides a clear understanding of how to design a better experience when it comes down to enjoying a restaurant in the GMA. Therefore, based on the above analysis, and especially in the "key drivers", the proposal for the current study is outlined as follows:

Graphic 6
Proposed model



Source: Own elaboration.

Certainly, there are elements that reflect a similarity to the American index model of customer satisfaction; however, there are some other contributions of great validity. Firstly, the model states that everything starts when expectations are formed, which are somehow implicit in any process where customers make a decision. Hence, preformed expectations create a notion of what the customer is to receive and it is right there the point that the perception of quality comes into play. Having gone through that, and particularly in the restaurant industry, the quality of food and service are extremely important variables as well as covering basic customer needs, which seek to provide an added value. Furthermore, the environment also plays an important role, since the atmosphere directly impacts the comfort that is offered. As for the price, one should think that it is right according to the market, since although the industry has not exactly the lowest prices, if it enforces. Altogether, they form value to the customer, which is weighted according to the criteria of the customer, and ultimately validates a general assessment of the aforementioned variables. Such evaluation or full trial pages are different for

each customer, as their expectations and perceptions vary according to several factors in each individual.

It is important to bring up both the strengths and the weaknesses of the variables considered in the present study, given that identifying best and worst aspects can be integrated strategy to potentiate those who do not seem to provide customer value.

First, it is important to mention that these results are interpreted based on the "Key drivers" analysis. Having said that, food factors considered three strengths: presentation, smell and taste. Such factors were properly assessed by the customer, and while there are more, they proved to be the most significant regarding to food. Therefore they are competitive factors. In contrast, it was found that portions are not exactly the best ones, because the study marks a weakness on that factor, so it is assumed that the client is not satisfied or, disapproves the portion of their food. Thus it should be investigated whether the portion was not enough (which is most likely) or if it was too much.

As for service, the model considers both the kindness and courtesy which are key elements. In fact, the model would accept more service-related factors, but unfortunately only considered those that make the difference. This is mentioned because the analysis showed that the predominant factors are the ones which turned out to be competitive and they belong to service. Therefore, it is assumed that presents many of the reasons why the customer experience greater satisfaction. While on the other hand, the service was severely affected by the lack of parking at many of the restaurants, which negatively affects the overall service. That's why it is considered as the main weakness, which undoubtedly is the worst because of their position in the analysis of key drivers.

Meanwhile, the environment has not so salient factors such as service, but if an indirect impact to the customer. It was found that the scent inside contributes positively to overall satisfaction in the environment. Therefore, in this research is considered as a strength in its field. On the other hand, a factor which is apparently difficult to deal with is the temperature, which affects the customer when expecting to enjoy food in a comfortable and relaxed way.

Finally, price has turned out to have its own strength, which frequently affects food. However, customers show dissatisfaction regarding prices assigned to drinks. It can be interpreted as a weakness in the industry. Interestingly it was found that the customer is willing to pay a lot as long as he or she is satisfied, and ironically, rich people tend to care more about

money. Here it is where the next link comes into play, "added value". Thus, the three hypotheses are validated.

References

Anderson, E. W., Fornell, C., & Mazvancheryl, S. K. (2004). Customer satisfaction and shareholder value, *Journal of Marketing*, *68*(October), 172–185.

Arnould, E. J, Price, L. L. & Tierney, P. (1998). Communicative staging of the wilderness servicescape. The Service Industries Journal, 18 (3), 90-115

Babin, B. J. & Attaway, J. S. (2000). Atmospheric affect as a tool for creating value and gaining share of customer. Journal of Business Research, 49(2), 91-99.

Bansal, H. & Taylor, S. (1999). Beyond service quality and customer satisfaction: Investigating additional antecedents of service providers switching intentions. *Developments in Marketing Science*, 22, 75-82.

Bawa, K., Srinivasan, S., & Srivastava, R. (1997). Coupon attractiveness and coupon proneness: A framework for modeling coupon redemption. *Journal of Marketing Research, 34*, 517–525.

Choi, T. Y., and R. Chu. 2001. Determinants of hotel guests' satisfaction and repeat patronage in the Hong Kong hotel industry. *International Journal of Hospitality Management* 20 (3), 277–297.

Churchill, G. A., & Suprenant, C. (1982). An investigation into the determinants of customer satisfaction. *Journal of Marketing Research, 19*, 491–504.

Cronin, J., Brady, M. & Hult, T. (2000). Assessing the effects of quality, value, and customer satisfaction on consumer behavioral intentions in service environments. *Journal of Retailing*, 76 (2), 193-218.

Cronin, J., Brady, M. & Hult, T. (2000). Assessing the effects of quality, value, and customer satisfaction on consumer behavioral intentions in service environments. *Journal of Retailing*, 76 (2), 193-218.

Dube, L., Renaghan, L.M., & Miller, J.M. (1994). Measuring customer satisfaction for strategic management. *Cornell Hotel and Restaurant Administration Quarterly, 35*(1), 39-47.

Ezeh, C. & Harris, L. C. (2007). Servicescape research: a review and a research agenda. The Marketing Review, 7(1), 59-78. Westburn Publisher Ltd.

Grönroos, C. (1994). *Marketing y gestión de servicios: la gestión de los momentos de la verdad y la competencia en los servicios*. Madrid: Díaz de Santos.

Grunert, K.G. (2005). Food quality and safety: Consumer perception and demand. *European Review of Agricultural Economics, 32*(3), 369-391.

Gupta S. and Zeithaml V. (2005), Customer Metrics: The Past, the Present, and the Future in Academia and Practice, *Marketing Science Institute*, Special Report No. 05-200.

Jones, T.O. and Sasser, W.E. Jr. (1995). Why satisfied Customers Defect?. *Harvard Business Review*, 73 (6), 88-99.

Juran, J.M. (1981). Product Quality – A Prescription For The West. *Management Review*, 70, (6) 8-14.

Klara, R. (2001). Please please me. *Restaurant Business, 100*(4), 22.

Kotler, P. (1973), Atmospherics as a marketing tool. Journal of Retailing, 49(4), 48-64.

Lee, Y. and N. Hing (1995), Measuring Quality in Restaurant Operations: An Application of the SERVQUAL Instrument, *International Journal of Hospitality Management*, 14, 293-310.

McCall, M., Eckrich, D. W., & Bruneau, C. L. (2007). A preliminary investigation of consumptive delay and rebate programs. *Association of Marketing Theory and Practice Proceedings, 14*(5), 1–5.

McDaniel, C. y Gates, R. (2007). Marketing Research. Seventh ed. United States of America. 488

Nagle, T. T., & Holden, W. (2002). *The strategy and tactics of pricing*. Englewood, Cliffs, NJ: Prentice-Hall.

Oh, H. (2000). Diners' perceptions of quality, value, and satisfaction: Apractical viewpoint. *Cornell Hotel and Restaurant Administration Quarterly*, 41 (3), 58-66.

Oliver, R.L. (1993), Cognitive, Affective and Attribute Base of the Satisfaction Response, *Journal of Consumer Research*, 20(12), 418-430

Parasuraman, A., Zeithaml, V. & Berry, L. (1988). SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. *Journal of Retailing*, 64 (1), 12-40

Parasuraman, A., Zeithaml, V.&Berry, L. (1985).Aconceptual model of service quality and its implications for future research. *Journal of Marketing*, 49 (4), 41-50.

Patterson, P.G., Johnson, L.W. and Spreng, R.A. (1997), "Modelling the Determinants of Customer Satisfaction for Business-to-Business Professional Services", *Journal of the Academy of Marketing Science*, 25(1), 4-17

Paula A.D., Long R. and Weiner D.E. (2002), Are Your Patients Satisfied, *Marketing Health Services,* 22(3), 28-32.

Röhr, A., Lu'ddecke, A., Drusch, S., Muller, M.J. & Alvensleben, R.V. (2005). Food quality and safety – Consumer perception and public health concern. *Food Control, 16*, 649-655.

Soman, D. (1998). The illusion of delayed incentives: Evaluating future effort-money transactions. *Journal of Marketing Research, 35*(4), 427–438.

Soriano, D.R. 2002. Customers' expectations factors in restaurants. The situation in Spain. *International Journal of Quality & Reliability Management, 19*, 1055-1067.

Spreng, R. A., & Mackoy, R. D. (1996). An empirical examination of a model of perceived service quality and satisfaction. *Journal of Retailing, 72*(2), 201–214.

Spreng, R. A., & Mackoy, R. D. (1996). An empirical examination of a model of perceived service quality and satisfaction. *Journal of Retailing, 72*(2), 201–214.

Stevens, P., Knutson, B., & Patton, M. (1995). DINESERV: A tool for measuring service quality in restaurants. *Cornell Hotel and Restaurant Administration Quarterly*, *36*(2), 56–60.

Stevens, P., Knutson, B., & Patton, M. (1995). DINESERV: A tool for measuring service quality in restaurants. *Cornell Hotel and Restaurant Administration Quarterly*, *36*(2), 56–60.

Turley, L.W. and Milliman, R.E. (2000). Atmospheric effects on shopping behavior: a review of the experimental evidence. Journal of Business Research, 49(2) 193-211. New York: HarperCollins.

Wakefield, K. L., & Inman, J. J. (2003). Situational price sensitivity: The role of consumption occasion, social context and income. *Journal of Retailing, 79*, 199–212.

Yüksel, A. and Yüksel, F. (2002) Measurment of tourist satisfaction with restaurant services: A segment-based approach. *Journal of Vacation Marketing.* 1(9), 52-68.

II

Competitiveness and financial performance

6
The architecture of the personal finances of the economically active population of Mérida, Yucatán: attitude, knowledge and behavior

Laura Guillermina Duarte Cáceres[1]
Martha Isabel Bojorquez Zapata[1]
Yolanda Leonor Rosado Muñoz[1]

Abstract

In recent years there has been a great interest of governments and financial institutions to educate people in a better manage of their personal finances. It has been observed the need to pass knowledge, to measure financial behavior and try to change financial attitudes. This paper through a quantitative study is to establish the relationship between attitude, knowledge and behavior of people in relation to 8 axes of personal finance. The results were obtained through a survey applied in February 2012. The analysis of the study data, results that most of the correlations are relatively low, although statistically significant.

Keywords: Personal finance, financial education, attitude, knowledge, behavior.

1. Facultad de Contaduría y Administración- Universidad Autónoma de Yucatán

Introduction

The importance of foreseen and planning the heritage's present and future, it's not only part of the personal economy but the decision made in personal finance affect the economy of a country. Therefore the economic well being of a country is part of the financial well being of a person.

André Laboul(as cited in OCDE, 2009) mentions that one of the results of the financial crisis that have happened in the last 15 years, have been the interest develop by some governments in subjects related of the knowledge of finances and education in this field. The politic economic strategies of many countries value each time higher importance to the financial education, as a life attitude as a behavior that contributes to the financial and economic stability of a country.

On Mexico's case the Federal Government of Felipe Calderon Hinojosa (National development plan , 2007-2012) establish the goal of financial education on the population in one of the five area of public policy management; the area of competitive economy and employment generator, in point 2.2 Efficient financial System 2.2 mentions the aim of increase the interaction between the financial sector and theirs users, motivating the users through a financial education that supports them making choices about financial services and products, more accurate and according to their conditions.

Most of the studies about personal finance advocate performing works of a specific topic, like attitude, knowledge or behavior, but very few are those who see these three concepts as a whole in the person financial formation. The reason of this work, that has as an objective establish the relation between financial attitude, knowledge and behavior of the economically active population of Merida Yucatan.

Review of the literature

Vergara, Ortiz y Brailovsky (1997, p. 2) conceived as personal finances "the efficient administration of money to increase the standard of living and a more direct route to really important goals".

Anderson (1982, as cited in Marsh, 2006) suggest that personal finances involves people learn to: 1) have a certain goal, 2) recognize what their revenue bases are, 3) target a financial development plan , 4) imple-

ment a financial plan, 5) adjust the plan, and 6) calculate, evaluate and review the progress of the goals.

To Juarez (2008) personal finance is the management of an income that a person receives for physical and / or intellectual work, or by capital investment also the application of them, is in search of a well being and economy accumulation that allows a development in society.

The foundation of the Personal finances must be the Economy because the concepts and principles of this science allow us to study personal finances from the different economic relations that are tied to the individuals as consumers, savers, investors and income generators. Also, it lets you see through economic reasoning the critical judgments about financial decisions, since these decisions will have consequences in their future and the future of the nation (Morton, 2005).

Personal finance present as a problem to management, the lack of financial information of the population, either disinterest of the lack of clear information from the institutions about the products and services that they offer, which creates distrust in the use of saving, credit and investment instruments. Another barrier of the personal finance is the lack of long term planning (Mexico Banker Association (ABM, 2011).

In general is establish that personal finance focuses on the management of the monetary and nonmonetary heritage, it's related to the concepts of planning, investment, indebtedness, savings, cash management, insurance and legal aspects such as inheritance and taxes payment, subjects in which people make choices determine to preserve and increase their capital or properties. The personal finance depends on a financial education; bought concepts contribute on results in the people financial lifestyle.

Buckland (2010) mentions financial education is related to cash management in order of achieving an objective. Although emphasize that in order to have adequate financial education it must contain knowledge, abilities and attitudes about daily and long term finances to maintain or promote their own financial well being.

Financial knowledge means understanding the processes (politics and programs) that affect household finances from the macroeconomics to house holding planning. Abilities or behavior is referred to the capacity of accomplishing some activities such as the budgeting, comparison shopping and financial planning. The attitude is referred as a sense of hope in the future and the conviction that you have some control over your own life (Buckland, 2010; Marsh 2006). Other authors as Atchley

(1998, as cited in Marsh, 2006), comments that the knowledge of financial education is essential and is the physical support of mental health, individual satisfaction, having a satisfactory marriage, a family and employment. Considers that personal finances could help a family to solve new conflicts about financial difficulties.

Although Garman y Forgue (as cited in Kim, 2000) can see that is necessary the comprehension of financial terminology to a good management of personal finances. This author consider the financial terminology as the knowledge of the facts and the needed vocabulary to a more successful management of the personal finances

Areas of personal finance

For Clason (1994) personal finance include: expenses control, savings, make money off, ensure that the property is profitable, secure income for the future and increase the ability to acquire goods.

Keown (2004) Clasifies on: financial plan, Money management, investment management protection, life change, legal issues and retirement.

Waschka (2001) considered a better division if they are classified as expenses, target savings, investments, indebtedness, maximum tax reduction, and risk management.

Bojorquez and Diaz (2007) through a compilation of various studies find that personal finances are 8 main areas: Financial Planning, Cash Management, Savings, Investment, Debt Management, Legal and Tax Organization, Contingency Planning and Savings Retirement.

Financial planning

Besley and Brigham (2009) note that personal financial planning should have a range of short and long term goals as well as acquisition of personal property and services. As you grow professionally as a family so, plans are becoming increasingly complex.

Gitman and Zutter (2012) mentions that financial planning indicates the path that lead, coordinate and control the behavior of people to achieve their goals.

According to BBVA Bancomer (2012, sp) personal financial planning is "the process through which an individual analyzes his financial situation, set financial goals, and makes it plans to achieve these objectives." Besley and Brigham (2009, p. 690) notes, "people do not plan to fail financially, but fails for no financial planning."

Cash Management

Gitman (2007), states that cash management is one of the key areas of finance; it is called "working capital". Cash is considered a fund to cover unforeseen expenses and reduce the risk of a liquidity crisis. The determination of the cash flows is one of the key aspects of any financial planning (Gitman and Zutter, 2012).

The constant movement, the cash inflows and outflows are the cash flow. The difference between the two concepts determines if the cash flow is positive or negative. Having a positive cash flow means the ability to pay bills on time or meet other expenses immediately, likewise having a positive cash flow availability means to save, to achieve long-term goals, like being able to retire calmly, make payment on a home, insurance, among others (Besley and Brigham, 2009).

Saving

Carrera (2008) conceived the savings as that difference between what is received (income) and what is spent.

Samuelson and Nordhaus (2006) indicate that the consumer decides whether to invest or save money, the consumption theory states that the act of consuming is at the end of the economic process, the act is the direct personal use of property and productive services to meet needs, resulting in market demand for the goods they purchase. The decisions of consumption and savings in the economy are determined by the families considered the basic units of analysis to be the simplest institutional unit within the economy

Saving involves not only store money, but also is buying the right thing; spend consciously and organized (Carrera, 2008).

Investment

According to Morales (2002), the investment is considered the portion of resources whose purpose is the generation of a future benefit. He says that investment; broadly is classified as real investment and financial investment. Real investment is what is done in tangible assets that are not easy to perform. Normally this is real as plant and equipment, inventories, land, real estate and even an entire company, refers to investment in physical assets. And the financial investment is made in readily mar-

ketable goods or liquids. Stocks, currencies, derivatives are classic examples of financial markets. Normally, the liquidity of an asset is assured through a financial market.

Villalobos (2012) points out the desirability of diversifying investment that is distributed through various instruments available to achieve the best possible performance with controlled risk.

Every investment has a close relationship with the performance and risk terms (Villalobos, 2012; Gitman&Zutter, 2012; Besley& Brigham, 2009)

- Output is the payment or return on investment
- Risk is the possibility that the actual return of investment is different from expected return.

The difference between investment and saving is that investment in the future benefit is expected, while saving is the simple act of postponing consumption.

Debt Management

According to the Royal Academy of the Spanish Language (RAE, 2010) debt is defined as "credit, which is the amount of money or equivalent that someone debts to a person or entity and that the creditor is entitled to demand or collect." Credit is debt, which comes from the inability to make payments to a beneficiary (Joo& Grable, 2004; Lea, Webley& Walker 1995; Parotta& Johnson, 1998 as cited in Dowling, Corney&Hoiles, 2009).

When the person is in a shortage of money, the credit appears as a pattern of conduct to meet living expenses. Lusardi and Mitchell (2006) find that people with an advanced level of financial literacy, must be able to properly manage debt, considering in its planning and decision making the impact must have adequate foresight and efficient management credit. Therefore can be defined as the administration of debt that an individual's ability to efficiently handle consumer credit, controlling its present subsistence expenses, but also their willingness to not forget their own needs or future needs.

Legal and Tax Organization

Article (Art.) 31 fraction (Fracc.) IV of the Mexican Constitution states that are obligations of Mexican people: "to contribute to public expenditure and of the federation and the Federal District or the state and municipality of residence, the proportional and equitable manner provided by law. "The Federal Tax Code in its Article 2 classifies the types of contributions:

- Taxes
- Social Security Contributions
- Contributions of improvements
- Rights

According to the foregoing and the applicable law, the main federal taxes that apply to people as individuals are: income tax (ISR), Tax on cash deposits (IDE) and Value Added Tax (VAT) at the level state and municipal Vehicular Tenure and House Property Tax respectively applies.

Moreover, the Civil Code of the state and federal matters (additionally the Federal District), fits the legal aspect of the various types of contracts involving individuals with environments that develops as: contracts of work, leases, contracts of buying and selling, contracts or pre-nuptial agreements, bailment, deposit, donation, factoring, bonds, mortgages, leasing, construction and services, exchange, pledge, loan, marriage and testament.

The above paragraphs indicate the most relevant aspects that a person should consider in managing personal finances, to have in order legal and tax aspects that might be found.

Contingency Planning

The risk is the possibility of incurring a loss, and insurance is one of the methods you can use to share. There are two types of risk:

1. Commercial risk, which refers to a corporate risk and cannot be secured, it is not measurable. One can't obtain insurance protecting you for failing in a company's internal target.
2. Static or non-commercial risk: are external risks, and may be covered by insurance. Those include floods, fires, slips and falls. (Nelson, and Pepin, s. F.). The commercial risk is not one that should be considered in managing personal finances.

Insurance is protection against lost in exchange for a relatively small payment, called a premium, and it aims to provide comfort to its possessor. Article 3 rd of the Agenda for Insurance and Finance (2012) states that "performs an active operation of insurance when if you present an uncertain future event, planned by the parties, a person, upon payment of an amount money, agrees to indemnify another a damage, directly or indirectly or pay a sum of money. " Various institutions like Mapfre Insurance, GNP Insurance and the National Commission for the protection and defense of consumers (CONDUSEF) present different types of insurance available in the market:

- Personal Insurance: Life: individual, group or collective Pensions: derived from social security, and accidents and diseases (personal accident, medical expenses).
- Property Insurance: Cars: residents, tourists and trucks; Damage: liability, marine and transportation, fire, earthquake or credit; Miscellaneous: burglary, theft of goods, money and valuables, personal items, crystals.

Planning for old age or retirement

In Mexico, retirement savings plans are managed by operators of investment funds, insurance companies and banks, which invest the savings of their clients in investment companies specializing in Retirement Funds (Siefores), distributed among a variety of financial instruments, from debt to equity funds in order to diversify (Suarez, nd). Personal contributions for retirement savings enjoy tax benefits (Income Tax Law, Article 176, Fracc. V).

The workers insured by the Mexican Institute of Social Security (IMSS), are entitled to "employer and worker contributions" to create a retirement fund, which provides that the insured person will begin to enjoy the fund in any of the following situations (Social Security Act, Articles 154, 155, 156, 157 and 162):

- Unemployment in old age, it is required that the insured has sixty-five years of age and be recognized by the IMSS at least two hundred fifty thousand weekly contributions
- It is sixty years or more and meets the recognized contribution weeks before the IMSS (a minimum of two hundred fifty thousand weekly contributions) may withdraw the balance of your individual account

in a single payment or continue to contribute to cover the weeks needed to operate his pension.

- Unemployed or non a paid work, the worker may have a portion of their savings fund the 46 calendar days of losing your job, provided if you have at least three years of opening a savings fund and a minimum of 12 months of contributions in the IMSS, this withdrawal may be exercised only once every five years.

Knowledge, attitudes and behavior of individuals in relation to personal finance

The psychological analysis model of economic behavior of Katona (1951) notes that the economic environment in influencing consumer purchasing shares, investment, savings and use of goods and services, in addition to these economic conditions, there are psychological factors that affect behavior, as are the motivations of the subject, knowledge, attitudes and expectations.

Albou's model (1978, cited by Quintanilla, 1997), is qualitative understanding how economic agents react to stimulus compared from both the interior (psychological aspect) as the context. It consists of two contextual bases that determine the psychological dimensions of economic behavior:

- The economic, political and sociocultural of a particular society at a particular historical period, and
- the psychological basis, the idea of effort and need to adapt to the demands of the environment;

The same author complements that the affective area, characterized by feelings and passions, has a key role in economic behavior and cognitive sector, as it influences the learning and knowledge and perception of reality and interpretation it.

Buckland (2010) notes neoclassical economic theory is a useful way of understanding knowledge and decision making of financial consumers. He Suggest that individual consumers, operating in frictionless markets, make decisions to maximize their satisfaction. Within this context of financial education, there are three points which are:

1) Consumer satisfaction is maximized by increasing consumption and leisure. To accomplish this, the consumer considers a long-term vi-

sion of your life, to make decisions about current consumption and maximize savings and a plan for life.
2) The life cycle theory is consistent with the neoclassical style from the consumer's perspective, where the power consumption based consumer expectations of future income,
3) Neoclassical economic theory has no interest in the institutional context in which consumers make decisions, assuming instead that competitive markets provide desired goods and services at efficient prices.

Method

Type of research

The methodology used in this research is designed as follows:
- Quantitative approach: since the information is collected through a survey to assess the generality of the personal finances of the economically active population of the city of Merida, Yucatan.
- No experimental: Used without deliberately manipulate variables, ie phenomena are observed as given in its natural context and then are analyzed.
- Transversal: Data are collected at a single time: February 2012
- Correlational: Describe the relationship between variables in a given time.

Population

The study population for this research was the economically active population of the city of Merida, Yucatan, and that has or may have an interest in economic dynamics and therefore has a degree of involvement in personal finance. Such quality requirements are:
- Economically active employed and / or unemployed in any economic sector
- 18 and over, the age range is chosen from the 18 years to be of legal age to enter the workplace without restriction

It is understood as economically active population, all persons who during the reference period, performed or obtained a business or made a deliber-

ate search for participating in economic production of goods and / or services independently or subordinate, with Formal or without remuneration. Based on the above, the size of the population was 465.330 people, which is the estimate recorded in the National Survey of Occupation and Employment (ENOE) INEGI to the economically active population in the city of Mérida to the fourth quarter of 2011.

Sample Size

The formula used to obtain the sample size is corresponding to the interval estimation of a predetermined population proportion: The probability of occurrence is set to 0.5 because there is not a previous study where this ratio is obtained with respect to the variable used, also, this proportion will the larger sample size that can be recommended.

For the development of the formula, we consider the following information: 95% confidence level, 50% probability of occurrence, Probability of not occurrence 50%; 5% margin for error, and Population 465.330.

It is obtained from the formula 383.8 surveys to apply, however you decide to survey 402 people to slightly improve the estimation precision, ensuring a margin of error of + -5% at 95% confidence.

Instrument Design

The survey consists of 83 questions divided into five sections:

I. Sociodemographic aspects of respondents (12 questions)
II. Attitudes Related to 8 areas of personal finance (22 Likert scale questions)
III. Knowledge related to 8 areas of personal finance (17 Likert scale questions)
IV. Behaviors Related to 8 areas of personal finance (24 Likert scale questions)
V. Socioeconomic status (8 questions)

As part of the reliability analysis, were captured in SPSS yielding a Cronbach's alpha of 0.833, so the survey is deemed reliable, it exceeds 0.70 points as some authors claim that the minimum value of this ratio to be considered reliable a questionnaire

The primary sampling units were the electoral sections and the method of selection of the sample was probability proportional to the size

of the section, where the probability of being selected is based on the number of persons registered in the electoral roll for each section. In each section 20 surveys were implemented effective. Sections were used electoral and voter registration, as the most updated sampling frame at the time of the survey, in addition to which is the best coverage of the population is 18 and over.

Data analysis

For information processing was used SPSS, because of the facilities provided for the capture and processing of data, and the collection and analysis of results. This was necessary encoding each of the 83 questions comprising the instrument.

Identification of Variables

- Attitude: Ajzen and Fishbein, as cited in Kim (2000, sp) define attitude as "preparation for attention or a particular action." He mentions that the attitude is a product of beliefs. Attitude is one of the important factors that influence behavior. Jointly, Marsh (2006) tells us that attitudes relate to how a person feels about personal finance issues.
  Therefore, it is understood as a state financial attitude or mindset that guides the responses that an individual gives to certain situations, learned predisposition and feelings about finances.
- Knowledge: Looking from the cognitive domain, knowledge refers to what is known about financial issues (Marsh, 2006). To which Kim (2000), indicates that financial literacy has become a basic skill for people to survive in today's society. Researches on the topic have found that financial literacy is related to the behavior in terms of personal finance (Hira et al., 1992, as cited in Kim, 2000).
  As knowledge refer to understanding of words, symbols and arithmetic operations.
- Behavior: The behavior refers the conduct, how a person behaves in relation to financial matters. Behavior is an action (Marsh, 2006). The term behavior is considered a certainty to use skill and knowledge, the behavior is embodied in action.

Results

Below are the main findings in the study were classified by the 8 axes of personal finance: planning, cash management, debt management, investment, savings, contingencies, legal and fiscal organization and retirement savings, regarding the attitude, knowledge and behavior of respondents.

1. Relationship between attitude and knowledge of the axes of personal finance

The study of the relationship between the attitude and knowledge of the eight axes of personal finance are carried out by the Pearson correlation coefficient.

As a result of the study all correlations were relatively low, although statistically significant, except for the case of the correlations between the attitude to saving and borrowing knowledge and contingencies (see Table 1).

In accordance with the criteria used by different authors in social research, a correlation of 0.3 is relatively low but acceptable. Based on the above, the correlations aspects above this value, were as follows:

- The attitude of planning regarding knowledge of planning, cash management, debt, savings, investment, contingencies and retirement savings.
- The attitude towards borrowing from knowledge of cash management, debt, savings, investment, contingencies and retirement savings.
- The attitude to contingencies regarding knowledge of cash management, debt, savings, investment, contingencies and retirement savings.

It should be noted that the attitude and knowledge with lower correlation values were those relating to the legal aspects and the highest indebtedness referents.

2. Relationship between attitude and behavior of the area of personal finance

The study of the relationship between attitude and behavior of the eight areas of personal finance was performed by Pearson correlation coefficient.

As a result of study correlations were observed to be low even if there is a statistically significant as shown in Table 2.

Table 1

Test of correlation between the various axes of the personal finances according to the attitude and knowledge

	Planning knowledge	Cash management Knowledge	Debt Knowledge	Saving Knowledge	Investment Knowledge	Legal Aspects Knowledge	Contingency Knowledge	Retirement savings Knowledge
Planning Attitude	**0.311** **	0.338 **	0.438 **	0.357 **	0.418 **	0.266 **	0.301 **	0.386 **
Cash Management Attitude	0.133 **	**0.166** **	0.228 **	0.165 **	0.190 **	0.131 **	0.154 **	0.147 **
Debt Attitude	0.213 **	0.318 **	**0.427** **	0.325 **	0.389 **	0.232 **	0.310 **	0.315 **
Saving Attitude	0.146 **	0.127 *	.160	**0.210***	0.144 **	0.117 *	.075	0.206 **
Investment Attitude	0.250 **	0.222 **	0.232 **	0.242 **	**0.202** **	0.272 **	0.200 **	0.225 **
Legal aspects Attitude	0.188 **	0.219 **	0.234 **	0.257 **	0.202 **	**0.231** **	0.276 **	0.254 **
Contingency Attitude	0.208 **	0.318**	0.391 **	0.300 **	0.376 **	0.247 **	**0.346** **	0.382 **
Retirement savings Attitude	0.098 *	0.166 **	0.186 **	0.168 **	0.134 **	0.155 **	0.156 **	**0.197** **

Source: Own

** Correlations is significant at the 0.01 level(2- ailed).

* Correlation s significant at the 0.05 level (2-tailed).

Table 2
Test of correlation between the various areas of the personal finance according to the attitude and behavior

	Planning Behavior	Cash management Behavior	Debt Behavior	Saving Behavior	Investment Behavior	Legal aspects Behavior	Contingency Behavior	Retirement savings Behavior
Planning Attitude	**0.393** **	0.417 **	0.359 **	0.243 **	0.340 **	0.236 **	0.320 **	0.210 **
Cash management Attitude	0.238 **	**0.287** **	0.232 **	0.164 **	0.271 **	0.177 **	0.241 **	0.130 **
Debt Attitude	0.442 **	0.406 **	**0.537** **	0.370 **	0.331 **	0.173 **	0.344 **	0.152 **
Saving Attitude	0.109 *	0.148 **	.079	**0.194** **	0.157 **	0.184 **	0.119 *	0.243 **
Investment Attitude	0.160 **	0.220 **	0.150 **	0.228 **	**0.261** **	0.225 **	0.245 **	0.158 **
Legal aspects Attitude	0.214 **	0.276 **	0.176 **	0.249 **	0.211 **	**0.245** **	0.171 **	0.153 **
Contingency Attitude	0.318 **	0.380 **	0.286 **	0.266 **	0.322 **	0.265 **	**0.406** **	0.195 **
Retirement savings Attitude	0.125 *	0.110 *	.055	0.249 **	0.205 **	0.180 **	0.175 **	**0.207** **

Source: Own
** Correlations is significant at the 0.01 level(2- tailed).
* Conrrelation is significant at the 0.05 level (2-ailed).

Consistent with the approach used in social research in accepting a correlation of 0.3, with correlations aspects above this value, were as follows:

- The attitude of planning regarding the behavior of cash management, indebtedness, investment and contingencies.
- The attitude of the indebtedness on the behavior of planning, cash management, debt management, savings, investment and contingencies.
- The attitude of the contingencies on the behavior of planning, cash management, investment and contingencies.

It is observed that the correlation values are lower savings attitude regarding borrowing behavior, and attitude of retirement savings in borrowing behavior.

3. The relationship between knowledge and knowledge of personal finance areas.

The study of the relationship between knowledge and the knowledge of the eight areas of personal finance are carried out by the Pearson correlation coefficient.

As a result of the study all correlations were statistically significant, with some exceptions, as shown in Table 3.

Respects with the value exceeding 0.3 correlations were as follows:

- Knowledge of planning with all aspects of behavior, but the behavior of debt, savings, legal and retirement savings.
- Knowledge of cash management regarding the behavior of the planning, cash management, debt management and contingencies.
- Knowledge of debt on the behavior of the planning, cash management, debt management, savings, investment, contingencies and retirement savings.
- Knowledge of the savings with all aspects of behavior, except as to the conduct of legal issues.
- Knowledge of investment in all aspects of behavior, behavior except legal and retirement savings.
- Knowledge of legal aspects and contingencies with all aspects of behavior, except saving behavior.

Knowledge to cash management and knowledge of the contingencies to the behavior of the legal aspects, the correlation values were lower overall correlations with behavioral knowledge of personal finance are significant.

Table 3

Test of correlation between the various areas of the personal finances according to the knowledge and behavior

	Planning Behavior	Cash management Behavior	Debt Behavior	Saving Behavior	Investment Behavior	Legal aspects Behavior	Contingency Behavior	Retirement savings Behavior
Planning Knowledge	**0.332****	0.317**	0.260**	0.245**	0.315**	0.226**	0.373**	0.275**
Cash management Knowledge	0.444**	**0.434****	0.359**	0.285**	0.288**	0.199**	0.371**	0.239**
Debt Knowledge	0.512**	0.509**	**0.472****	0.371**	0.439**	0.211**	0.468**	0.321**
Saving Knowledge	0.391**	0.369**	0.371**	**0.328****	0.382**	0.264**	0.360**	0.303**
Investment Knowledge	0.444**	0.392**	0.403**	0.346**	**0.397****	0.224**	0.405**	0.291**
Legal aspects Knowledge	0.328**	0.362**	0.307**	0.291**	0.396**	**0.335****	0.376**	0.320**
Contingency Knowledge	0.316**	0.425**	0.344**	0.299**	0.374**	0.179**	**0.389****	0.229**
Retirement savings Knowledge	0.388**	0.358**	0.324**	0.282**	0.303**	0.240**	0.395**	**0.324****

Source: Own

** Correlations is significant at the 0.01 level(2- tailed).

* Conrrelation is significant at the 0.05 level (2-tailed).

Conclusions

It is observed in the slopes of Planning, Debt Management and Contingency consistent relationship between the variables attitude, knowledge and behavior of each of these three areas, i.e. the economically active population demonstrated a statistically significant relationship that prevails in relationship of the three variables.

Therefore, planning attitude is correlated with knowledge in planning and in planning behavior. The same applies to the areas of Debt Management and Contingencies. As expressed an interest in highlighting these three topics.

Thus, the architecture of the personal finances of the economically active population of Merida, Yucatan is focused on short-term issues, leaving issues like savings, investment, retirement savings and tax and legal organization with attitudes and knowledge with correlations very low showing thatare issues that even if they are in any way in the management of personal finances, more priority is given to aspects of everyday individuals and families.

References

Agenda de Seguros y Fianzas (2012).

Albou, P. (1978). Modelo Ternario y Gráfico Previsional. *Psicología Económica: Fundamentos teóricos*. Ed.McGraw-Hill.

Quintanilla, I. (1997). *Psicología Económica: Fundamentos teóricos*. Ed.McGraw-Hill.

Asociación de Bancos de México (2011). *Finanzas Populares*, México, Recuperado de http://www.condusef.gob.mx/Revista/index.php/puntos-cardinales/119-semana-naci onal-de-educacion-financiera-revista-num-116.

BBVA Bancomer, (2012). *Educación Financiera*, Taller de Finanzas Personales, Recuperado el 20 de febrero del 2012 en http://www.adelantecontufuturo.com.mx/portada.aspx

Besley, S. y Brigham, E. (2009). *Fundamentos de administración financiera.* CENGAGE Learning: México

Bojorquez, M. y Díaz S. (2007). *"Finanzas Personales"*. Aplicación en la Población Económicamente Activa de Mérida, Yucatán, México, 2006. Tesis en obtención al grado de Maestría (no publicada), por la Universidad Autónoma de Yucatán.

Buckland, J. (2010). Are Low-Income Canadians Financially Literate Placing Financial Literacy in the Context of Personal and Structural Constraints. *AdultEducationQuarterly*. 60(4), 357-376. Recuperado de la base de datos EBSCO.

Carrera, M. (2008). Ahorro. *Proteja su Dinero*, México, 9(103), 14-15.

Clason, G. (1994). *El hombre más rico de Babilonia.* (J. Sánchez, Trad.) España: Ediciones Obelisco

Código Civil del Estado de Yucatán (2012). Consultado el 2 de Julio de 2012 en: http://www.yucatan.gob.mx/gobierno/orden_juridico/Yucatan/Codigos/nr173rf4.pdf

Código Fiscal de la Federación (2012). Consulado el 30 de Junio de 2012 en: http://www.diputados.gob.mx/LeyesBiblio/pdf/8.pdf

Constitución Política de los Estados Unidos Mexicanos (2012). Consulado el 30 de Junio de 2012 en: http://www.diputados.gob.mx/LeyesBiblio/pdf/1.pdf

Dowling N. A., Corney T., y Hoiles L. (2009). Financial Management Practices and Money Attitudes as Determinants of Financial Problems and Dissatisfaction in Young Male Australian Workers. *Asesoría Financiera y de Planificación*, 20, número 2 de 2009. Consultado el 13 de septiembre 2011, en: http://6aa7f5c4a9901a3e1a1682793cd11f5a6b732d29.gripelements.com/pdf/vol20_2dowling_corney_hoiles.pdf

Garman, E., y Forgue, R. (2009). *Personal Finance.* 10ª. Edición, Boston, Houghton, Mifflin, CengageLearnig.

Gitman Lawrence J., (2007). *Administración Financiera.*onceava edición, México, Puebla, Prentice Hall.

Gitman, L., Zutter, C. (2012). *Principios de administración financiera*. México: Pearson Educación.

Instituto Nacional de Estadística y Geografía (2011). *Encuesta Nacional de Ocupación y Empleo ENOE.* Consultado el 13 de noviembre de 2011, de: http://www.inegi.org.mx/est/contenidos/proyectos/encuestas/hogares/regulares/enoe/default.aspx

Juárez M, G.D**.**(2009). *Finanzas personales en épocas de crisis ¿oportunidad o desgracia?.*en Contribuciones a la Economía, recuperado de:http://www.eumed.net/ce/2009b/

Katona, G. (1951). Análisis psicológico del comportamiento económico. En: Quintanilla, Nueva York: Elsevier Scientific Publishing.

Keown, A. (2004). *Personal finance.* Virginia Polytechnic Institute and State University. USA: Prentice Hall.

Kim, J. (2000). The Effects of Workplace Financial Education on Personal Finances and Work Outcomes. *Journal de Compensación y Beneficios*, 14, Consultado noviembre 21 de 2011, en la Base de Datos de la Biblioteca Virtual del Instituto Politécnico de Virginia y Universidad Estatal de Blacksburg

en: http://scholar.lib.vt.edu/theses/available/etd0421200017150023/unrestricted/TOC.pdf

Ley del impuesto a los depósitos en efectivo (2012). *Prontuario Fiscal*, México: Editorial CengageLearning.

Ley del impuesto empresarial a tasa única (2012). *Prontuario Fiscal*, México: Editorial CengageLearning.

Ley de Hacienda del Municipio de Mérida (2011). Consultado el 2 de septiembre de 2012 en: http://www.merida.gob.mx/finanzas/portal/norma/contenido/pdfs/Archivos2011/leyes11.pdf

Ley del impuesto sobre la renta (2012). *Prontuario Fiscal*, México: Editorial CengageLearning.

Ley del Seguro Social (2012). Consultado el 2 de septiembre de 2012 en: http://www.imss.gob.mx/instituto/normatividad/Documents/LSS.pdf

Ley General de Hacienda del Estado de Yucatán (2012). Consultado el 2 de septiembre de 2012 en: http://transparencia.yucatan.gob.mx/datos/2012/hacienda/LEY_GRAL_HACIENDA.pdf

Lusardi A. y Mitchell O. (2006). *Financial Literacy and Retirement Preparedness: Evidence and Implications for Financial Education.* Consultado el 22 de noviembre de 2011, Database Link Electronic University of Michigan Research Retirement Center en: http://www.mrrc.isr.umich.edu/

Marsh, B. A. (2006). *Examining the Personal Finance attitudes, behaviors, and knowledge levels of first-year and senior students at Baptist Universities in the State of Texas*. Consultado el 10 de septiembre de 2011 en la Base de Datos Ohio Link ElectronicTheses and Dissertations Center (ETD) en: http://etd.ohiolink.edu/view.cgi?acc_num=bgsu1151189375

Morales C., A. (2002). *Respuestas rápidas para los financieros,* México: Pearson Educación.

Morton J. (2005). The interdependence of economic and personal finance education. *Social Education*, 69 (2), 66.

Nelson, R., Pipino, D., (s. f.). Seguros y Administración de riesgos, *Notas Breves,* Recuperado de EBSCO Primer Ministro en línea de Fuente de Base de datos Negocio.

Organization for Economic Cooperation and Development (OCDE) (2009). Proyecto de la OCDE sobre Educación Financiera. Consultado Mayo 16, 2011 en: http://www.oecd.org/dataoecd/61/14/46243486.pdf

Plan Nacional de Desarrollo 2007-2012, consulado el 10 de junio de 2012 en: http://pnd.calderon.presidencia.gob.mx/pdf/PND_2007-2012.pdf

Real Academia Española. (2010). Diccionario de la lengua española. 22ª. Edición. Consultado el 23 de mayo de 2012 en: http://lema.rae.es/drae/?val=crédito

Samuelson, P. y Nordhaus, W. (2005). *Economía* (18ª ed.). México: McGraw Hill.

Suárez, L., (s.f.). *Por qué Diseñar un Plan Personal de Retiro,* Fuente: soyentrepreneur.com, Recuperado de www.SoyEnirepreneur.com.

Vergara G., Ortiz A., y Brailovsky A. (1997). *Cuide su dinero y mejore su economía. Finanzas Personales*. México. Mc Graw Hill

Villalobos, J. (2012). Cómo invertir tus ingresos, *EntrepreneurMexico*, 20(2), 54-57. Recuperado el 1 de marzo de 2012 en: http://web.ebscohost.com/ehost/pdfviewer/pdfviewer?vid=7&hid=14&sid=34218ed7-eb00-45ac-9c07-ed94d187ea74%40sessionmgr15

Washka, L. (2001). *Ahorre, invierta y gane ¡Fácil!.* México: Prentice Hall.

7
Success factors of a quality model award

Jesús Gerardo Cruz Álvarez[1]
Alma Berenice Méndez Sáenz[1]

Abstract

TQM theory has been developed since earlier 70's and the overall model has been configured to include some key aspect such like: Leadership, costumer focus, strategically planning, human capital, new product development, operation management among others. One of the main questions is what elements are the most important of need to be considered as key element in order that a beginner company in this journey starts focus and aligning its strategy to the core elements that will rapidly cause a positive effect on its financial performance? Researchers have not got to a common agreement on what could be the key elements. This empirical paper make further research on some winners of the national quality award and what do they consider to be the main key elements of a TQM generalized model.

Keywords: Total quality management, leadership, customer focus, operation management, business results.

1. Facultad de Contaduría Pública y Administración de la Universidad Autónoma de Nuevo León

Theoretical background and hypothesis

Quality drives financial results

The aim of this research paper is to study the relationship between the elements of a quality award model and financial business results. This empirical research is taking into account different previous studies that deeply analyze the theoretical and empirical correlation between such factors; some studies found to have either positive or not conclusive linkage between constructs. Quality award model might be noticed as a practical extension of the overall TQM theory. Even though, that TQM is an integrated model the expectation is that should be some factors that might be considered as key drivers to financial business results.

The TQM theory based on quality award model is typically integrating eight factors: 1) leadership, 2) Strategic planning, 3) Customer focus, 4) Human capital, 5) New product, process, and service development, 6) Operation management, 7) Supplier development and 8) Social responsibility; however what factors are the ones considered as a key drivers to financial business results? This question is further analyzed from two perspectives theory and practice, in order to try to determine the key drivers in this equation.

Leadership

H_1: Leadership has no positive impact on financial results.
The relative importance of leadership for company's vision and strategy is well documented in different empirical studies lead by Lakshman, C. (2006), Zehira, C. et. al. (2012). Some other studies have linked leadership and TQM success Choi, T., Eboch, K. (1998), Davis T. (1997), Douglas, T.J. & Judge, W.Q. (2001). The literature has documented that leadership practices and business performance are related as described by Hackman, J., Wageman, R. (1995), Samson, D., Terziovski, M. (1999) and found to have positive relationship.

Organizational leadership is the basement of driving companies to maximize their core competences towards achieving the ultimate goals set in the strategy. Key performance indicators can rely on social responsibility, customer and financial results consistent to the findings documented by Sila, I. (1997).

Strategic planning

H_2: Strategic planning has no positive impact on financial results.
The most orthodox literature strongly suggests that strategic planning and financial results are positive correlated as described by Gicia, O. N. (2011), Rudd, J. et. al. (2008), even though there are different studies that are not conclusive in regards of this theoretical and empirical link as documented in previous research made by Pearce, JAI. et. al. (1987).

The common knowledge will base the good key performance indicators trending on strategic planning and how those strategies are wide spread developed throughout the company Rhyne, LC. (1986), Miller, C.C. et. al. (1994).

Customer focus

H_3: Customer focus has no positive impact on financial results.
Customer focus and its linkage to business financial performance have been documented in previous empirical research by Zakuana, N.M. et. al. (2010) and Han, S.M. (2007). The documented studies in large manufacturing firms revealed statistical evidence of a positive correlation between financial performance and customer as a key driver. Customer focus theoretical framework indicates key quality tools such as VOC (voice of the customer), house of quality, QFD (quality function deployment) and Kano's Model as the basement of business alignment to customer expectations, desires and needs as indicated by CQM. (1993), Kathawala, Y., and Motwani, J. (1994).

Prakash, O.M. et. al. (2008) and Hauser, J.R. et. al. (1988) analyzes customer focus strategy and highlight it as driver in the competitive market to gain customer preference.

Human capital

H_4: Human capital has no positive impact on financial results.
It is assumed that employee satisfaction, organizational development, knowledge management in general terms: the human capital has positive impact on financial results as indicated by Chi, C. G. (2009), Bernhardt, K.L. et. al. (2000), and Harter, J.K. et. al. (2002). There is almost no literature that describes a different relationship.

The main concept of human capital is based on employee satisfaction and organizational development that drives the employees to get involved and empowered to be proactive, focus on continuous improvement of day to day activities towards business results as presented by Koys, D. (2003).

New product, process, and service development

H5: New product, process and service development has no positive impact on financial results.

New product development should be considered as a powerful strategy to gain customer achieving their preference thru customer focus product. QFD (Quality Function Deployment) is a customer driven approach that transforms customer expectations into engineering requirement and manufacturing process parameters. According to Pang, J., et. al. (2011); QFD is extremely important during product design stage. Working papers and empirical research has proven the effectiveness of QFD application during product design gate by Govindalruri, S.M, Cho, B.R. (2007), Freiesleben, J. (2010) and Sharma, J.R., Rawani, A.M. (2007).

New product development requires the input of the customers, and this knowledge can be extracted and analyzed using some variety of marketing and customer driven tools such as: QFD (voice of customer and house of quality) and customer profile studies.

There are some theoretical studies that describe the relationship and business synergy of a well design customer oriented products can be found in Kano, N. et. al. (1984), Su, C. et. al. (2006), Fornell, C. et. al. (1987), Cristiano, J., et. al. (2000). The web base technology can also be used as a powerful tool to get closer to customers and know their perceptions (pros and cons) of a product. Initial web based technology focus on the voice of the customer was develop by Park, Y. et. al. (2011).

Operation management

H6: Operation management has no positive impact on financial results.

Operation management is emergent fields that focus on tactical level of business strategy as studied by Schroeder, R.G. (2005). OM (operation management) main goal is to increase productivity thru the design or redesign of current manufacturing footprint to optimize the process vari-

ables, reduce process variation and get product and/or services according to customer expectations ruled by specifications.

OM has been linked to business performance in general terms; however there is not a consensus of such correlation. Another perspective of OM is that is an umbrella of different productivity tools such as: TPM (total productive maintenance), LM (lean manufacturing), SS (six sigma), VA/VE (value added and value engineering) among others, and some of those are the key ones that are linked with positive correlation to business financial performance and not the overall OM theoretical framework indicated in previous empirical research by Arawatu, A. (2008) and Dinesh, S. (2006).

Supplier development

H_7: Supplier development has no positive impact on financial results.
The literature empathizes that supplier development has a positive impact on financial results throughout the supply chain as proposed by Deming, E. (1986). Supplier development effort focus on quality assurance, sourcing and economy of scale strategy, less suppliers, long term agreements based on product, process control reliability rather than only price per piece and shipping performance as studied by Kaynak, H. H. (2008), Saraph, J.V. et. al. (1989). Supply development has a strong correlation to the competitive capabilities of any company as documented by Garvin, D.A. (1987).

Social responsibility

H_8: Social responsibility has no positive impact on financial results.
Current customer/market order qualifiers identify the company social responsibility as one of the different factors to be considered by the customer while making a purchase decision or intent. The literature is widespread in different areas of social responsibility factors and its financial implications for instance Becchetti, L.E. (2011), Moskowitz, M.R. (1972), Creyer, E. et. al. (1997).

There are studies that support that social responsibility impacts the company financial results while other are not conclusive to support this relation as proposed by Doh, JP. et. al. (2010), and McWilliams, A. et. al. (2000). Some other studies only evidence that social responsibility is an order qualifier to enter to the business rather than order winner factor.

Critical success factors in the quality model

H_{02}: X1, X2, X3, X5, and X6 have no positive impact on financial results.
Business results and the theoretical background in regards of the key activities that drives financial results identifies TQM, lean manufacturing, quality awards/models, six sigma among others as overall strategies that influence any organization to get positive results on its key performance indicators Corredor, P.G. (2011), Ghobadian, A. et. al. (1996), Curkovic, S. et. al. (2000); however such strategies are extremely correlated to specific activities such like: leadership, strategic planning, customer focus, new product development and operation management as the key ones Yong, J. et. al. (2001), Lee, S.M. et. al. (2003).

There are some studies empirical research that proposes that the figure of TQM is captured by quality awards/models such like MBQA, EFQM (or in this case the Nuevo Leon Quality State Award) CCM. (2012), EFQM. (2012), NIST. (2012).

Table 1
Quality award model cross referenced to theoretical framework

Constructs	*Description of constructs*	*Theoreticalbackground*	*International qualityawards*		
			NLQSA	**MBQA**	**EFQM**
X_1: Leadership	Organizational leadership drives financial results.	Lakshman, C. (2006), Zehira, C. et. al. (2012), Choi, T., Eboch, K. (1998), Davis T. (1997), Douglas, T.J. & Judge, W.Q. (2001), Hackman, J., Wageman, R. (1995), Samson, D., Terziovski, M. (1999), Sila, I. (1997).	X	X	X
X_2: Strategic-planning	Strategic planning conceptualization and wide spread development drives financial results.	Gicia, O. N. (2011), Rudd, J. et. al. (2008), Rhyne, LC. (1986), Miller, C.C. et. al. (1994), Pearce, JAI. et. al. (1987).	X	X	X

Constructs	*Description of constructs*	*Theoreticalbackground*	*International qualityawards*		
			NLQSA	MBQA	EFQM
X_3: Customer focus	Customer focus is the based for companies success.	Prakash, O.M. et. al. (2008). Han, S.B. et. al. (2007). Zakuana, N.M. et. al. (2010). Hauser, J.R. et. al. (1988). CQM. (1993). Kathawala, Y., & Motwani, J. (1994).	X	X	X
X_4: Human capital	Human capital (empowerment and employee satisfaction) drives company's results.	Chi, C. G. (2009), Bernhardt, K.L. et. al. (2000), Harter, J.K. et. al. (2002), Koys, D. (2003).	X	X	X
X_5: New product, process and service development	New product development plays a high level role in company strategy in order to get competitive advantages in the market.	Kano, N. et. al. (1984), Su, C. et. al. (2006), Fornell, C. et. al. (1987), Cristiano, J.J. et. al. (2000), Park, Y. et. al. (2011), Pang, J. et. al. (2011), Govindaluri, S.M. et. al. (2007), Freiesleben, J. (2010), Sharma, J.R. et. al. (2007).	X	X	X
X_6: Operation management	Operation management seeks productivity and effectiveness in manufacturing or services. It is the tactical level strategy that deploys productivity and management tools to reduce and eliminate the waste (non value activities) and increase the efficiency.	Arawatu, A. (2008). Schroeder, R.G. (2005). Dinesh, S. (2006).	X	X	X
X_7: Supplier development		Kaynak, H. H. (2008), Saraph, J.V. et. al. (1989), Deming, E. (1986), Garvin, D.A. (1987).	X	X	X

Constructs	*Description of constructs*	*Theoreticalbackground*	*International qualityawards*		
			NLQSA	**MBQA**	**EFQM**
X_8: Social responsibility	Ethic and business sustainability are the social responsibility framework for today's company in the market.	Becchetti, L.E. (2011), Moskowitz, M.R. (1972), Creyer, E. et. al. (1997), Doh, JP. et. al. (2010), McWilliams, A. et. al. (2000).	X	X	X
Y: Business results	There are key activities that drives financial business results such like: leadership, strategic planning, customer focus, new product development and operation management.	Corredor, P.G. (2011), Ghobadian, A. et. al. (1996), Curkovic, S. et. al. (2000), Yong, J. et. al. (2001), Lee, S.M. et. al. (2003), CCM. (2012), EFQM. (2012), NIST. (2012).	X	X	X

Figure 1
The hypothesized theoretical model for Nuevo Leon State Quality Award

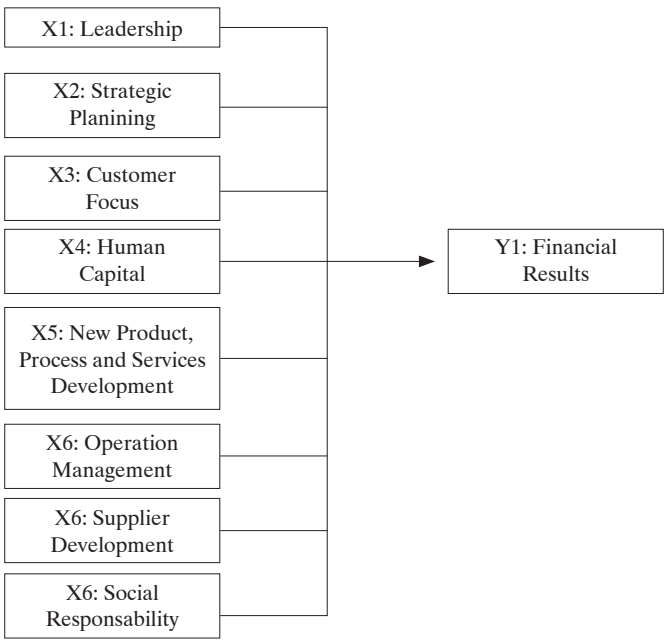
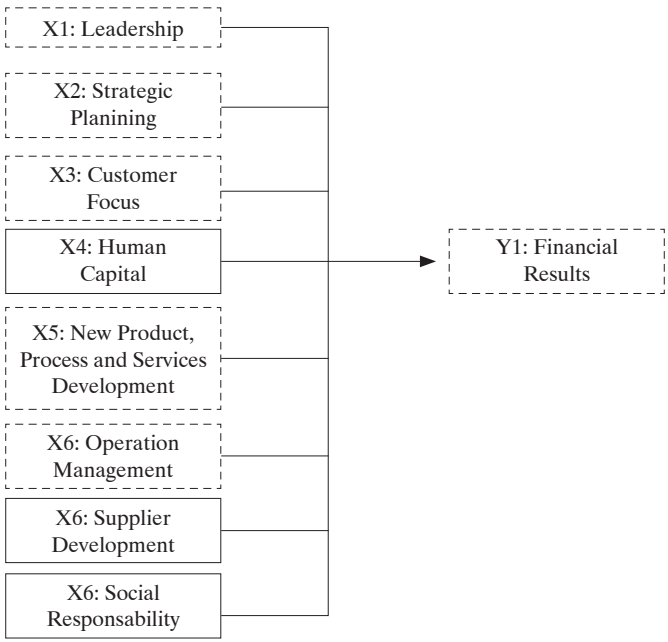


Table 2
Hypothesis concept model framework

Hypothesis (H_o / H_i)	
H_{o1}: X_1, X_2, X_3, X_4, X_5 X_6 X_7, X_8 have no positive impact to financial results	H_i: other case.
H_{o2}: X_1, X_2, X_3, X_5, X_6 have no positive impact to financial results	H_i: other case.

Figure 2
The hypothesized theoretical model for critical success factors in the quality model



Research Method

Sample

The city of Monterrey is one of the major research environments in order to conduct this type of research due to the amount of industrial activity that triggers economic activity. Monterrey is a city of Nuevo Leon state

and it is situated to be the third top contributor in gross domestic product. Nuevo Leon developed a local state quality model and award back in 1996, in 2009 opens the score and coverage to be national wide. In now days after 15 years of history more than 2000 companies had participated into the evaluation process and only few had accomplished the priceless award. This research focuses on the winners of the last two decades, the people that participated in this web based open survey were employees either middle staff or top managers of their organization (see Fig. 3).

Figure 3
Nuevo Leon State Quality Award's winners trend

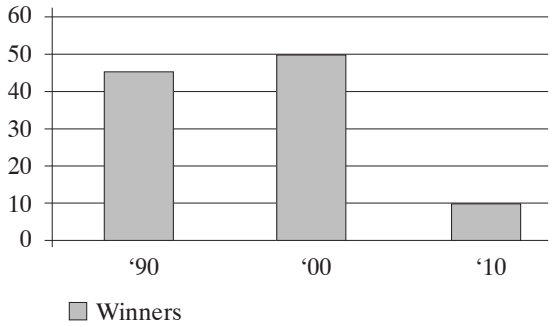
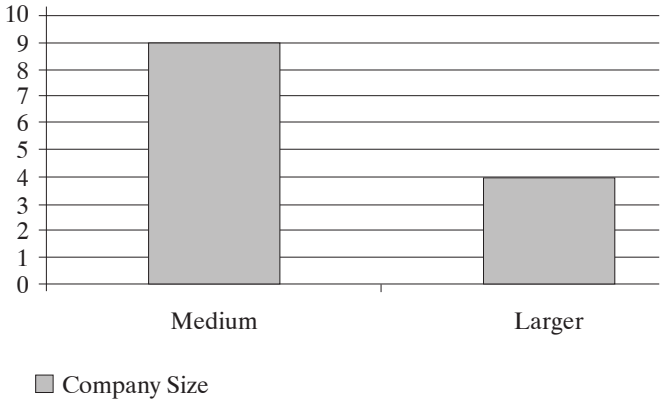


Figure 4
2000 to 2011 Industry winners



A stratified and random sampling was designed to take into account only respondents coming out of the industry category. This selected cluster

compiles 13 large organizations. The questionnaire invitation was distributed using internet services and the respondents used the web system to fulfill the different aspects of the research. A total of 33 fully completed and usable questionnaires were returned in a timeframe of 2 months. 100 % of the 13 large organization participated into the research and more than one person answered the questionnaire. Sample size and correction factor is shown in fig. 5.

Figure 5
Sample size and sample correction factor

$$n = \frac{z^2 pq}{B^2} = \frac{1.96^2 (0.85 * 0.15)}{0.05^2} = 195 \approx 196.$$

$$n' = \frac{1}{n} + \frac{1}{N} = \frac{1}{196} + \frac{1}{13} = 12.5 \approx 13.$$

Measurement

The only survey used a five-point lickert scale that varies from 1 (strongly disagree) to 5 (strongly agree), the demographic characteristics of the respondents is shown in the following table.

Table 3
Sample composition

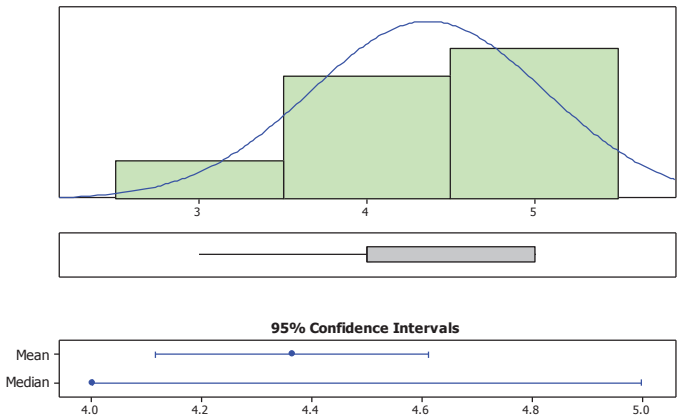
Variable	*Composition*
Sample	33
Gender	Men 77 %, Women 23 %
Age	30 – 45 Years
Education	Bachelordegreeorabove

Results

The preliminary analysis shows that Y factor (Impact to business results) is moving from 4 to 5 in the last third of Licker 5 point scale; the result

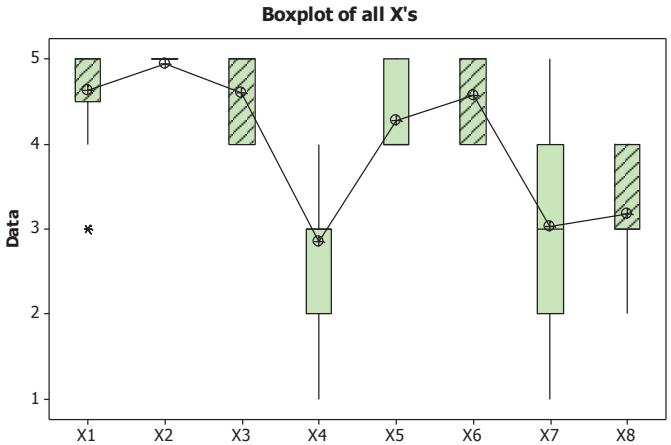
leads to believe that respondents identify some of the factors as the cause of a high business results (see Fig. 6).

Figure 6
Descriptive statistics for Y (Business results)



In the following analysis of variance between all factors (X_1, X_2, X_3, X_4, X_5, X_6, X_7 and X_8) identify some of the factors that are different, in this case: X_1, X_2, X_3, X_5, X_6. The key finding is that there is difference between factor, then there are some that are impacting more to Y (see Fig. 7).

Figure 7
ANOVA for all factors



The ANOVA analysis shows a p-value of 0.000 that is considered to be significant and R-Sq of 60.84% although is less than a typical expected value of 75% is sufficient evidence to affirm that there is a different in factors that could contribute more to the overall analysis of Y.

One-way ANOVA: X_1, X_2, X_3, X_4, X_5, X_6, X_7, and X_8.

Source DF SS MS F P
Factor 7 164.845 23.549 56.81 0.000
Error 256 106.121 0.415
Total 263 270.966

S = 0.6438 R-Sq = 60.84% R-Sq(adj) = 59.77%

Individual 95% CIs For Mean Based on
Pooled StDev

Level	*N*	*Mean*	*StDev*	--+---------+---------+---------+-------
X1	33	4.6364	0.6990	(--*--)
X2	33	4.9394	0.2423	(---*--)
X3	33	4.6061	0.4962	(--*--)
X4	33	2.8485	0.7550	(--*--)
X5	33	4.2727	0.4523	(--*--)
X6	33	4.5758	0.5019	(--*---)
X7	33	3.0303	0.9838	(--*--)
X8	33	3.1818	0.7269	(--*---)
				--+---------+---------+---------+-------
				2.80 3.50 4.20 4.90

Pooled StDev = 0.6438

The next step of analysis is to make a stepwise regression analysis for all $X_i$vs Y; The final model identifies X_1, X_3, X_6 and X_8 as the key variables that explains a total of 71.74% of overall variation.

Stepwise Regression: Y versus X1, X2, X3, X4, X5, X6, X7, X8

Alpha-to-Enter: 0.15 Alpha-to-Remove: 0.15
Response is Y on 8 predictors, with N = 33

Step	1	2	3	4
Constant	0.69767	0.04390	-1.15185	-2.81028
X1	0.791	0.773	0.757	0.729
T-Value	7.19	7.50	7.71	7.60
P-Value	0.000	0.000	0.000	0.000
X8	0.231	0.223	0.215	
T-Value	2.33	2.37	2.37	
P-Value	0.027	0.025	0.025	
X6	0.28	0.41		
T-Value	2.07	2.75		
P-Value	0.047	0.010		
X3	0.27			
T-Value	1.82			
P-Value	0.080			
S	0.435	0.407	0.386	0.372
R-Sq	62.52	68.26	72.35	75.27
R-Sq(adj)	**61.31**	**66.14**	**69.49**	**71.74**
Mallows C-p	**12.6**	**8.3**	**5.7**	**4.5**

This previous analysis is confirmed thru descriptive analysis that shows all key variables are situated in the high end of the scale either 4 or 5, except for X_8 that has a large mode identified in 3.0 of the scale (see Figs. 8, 9, 10 and 11).

Figure 8
Descriptive statistics for key variable X_1

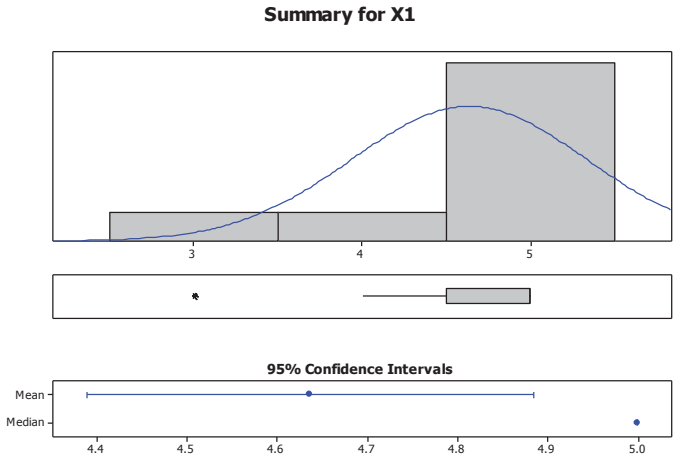


Figure 9
Descriptive statistics for key variable X_3

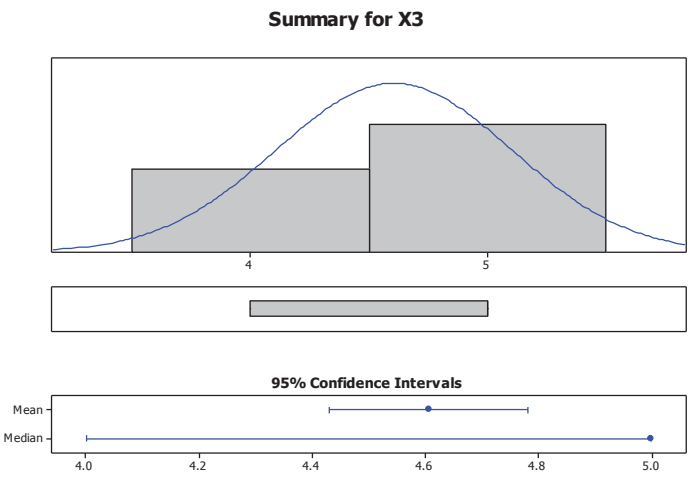


Figure 10
Descriptive statistics for key variable X_6

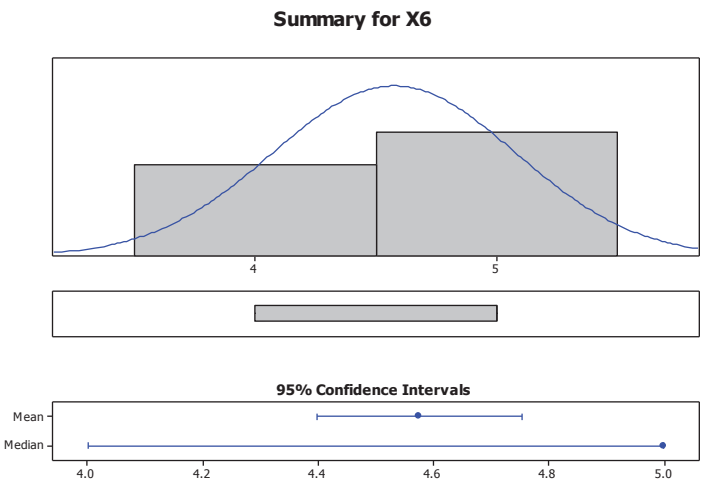


Figure 11
Descriptive statistics for key variable X_8

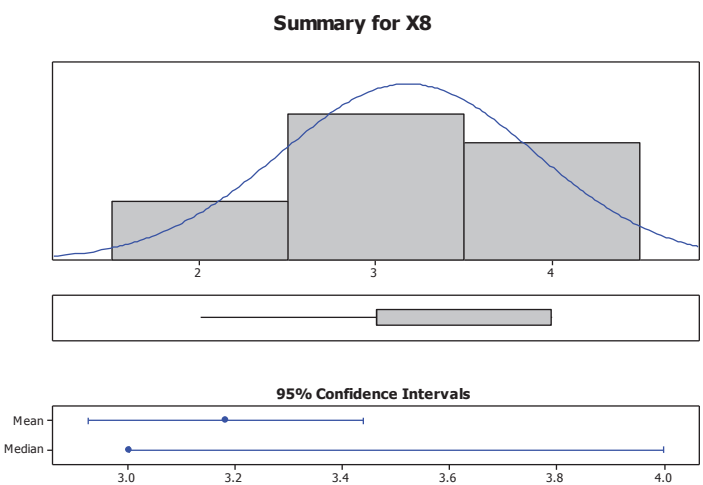


Table 4
Hypothesis test results

Hypothesis	*Test statistic*	*Approve or Reject*
H_1: Leadership has no positive impact on financial results.	ANOVA / Stepwise	Reject
H_2: Strategic planning has no positive impact on financial results.	ANOVA / Stepwise	Approve
H_3: Customer focus has no positive impact on financial results.	ANOVA / Stepwise	Reject
H_4: Human capital has no positive impact on financial results.	ANOVA / Stepwise	Approve
H_5: New product, process and service development has no positive impact on financial results.	ANOVA / Stepwise	Approve
H_6: Operation management has no positive impact on financial results.	ANOVA / Stepwise	Reject
H_7: Supplier development has no positive impact on financial results.	ANOVA / Stepwise	Approve
$H_{8:}$ Social responsibility has no positive impact on financial results.	ANOVA / Stepwise	Reject
H_{o2}: X1, X2, X3, X5, and X6 have no positive impact on financial results.	ANOVA / Stepwise	Approved

Discussion

The theoretical framework identifies key elements to be considered into a holistic model to drive business results based on total quality management theory; however TQM (Total Quality Management) considers all elements as key drivers with the same weight or impact to business results. Several studies have been made in order to demystify this hypothesis and there is no a common agreement in such matter, nevertheless in this empirical research we can identify key elements of the TQM model as the high impact drivers to business results: X_1: Leadership, X_3: Customer focus, X_6: Operation management and X_8: Social responsibility.

- X_1: Leadership. The theoretical framework clearly identifies that leadership is one of the key elements in almost all top management models to drive productivity. People engagement thru leadership is a key in all business environments. In particular TQM theoryisbasedon-Leadership.

- X_3: Customer focus. All organizations are driven by its customers for either public or non public organization; they provide product and services to the customers or service users. Customers are the reason why a firm was built. All products and services are driven by customer's needs.
- X_6: Operation management. We can think about TQM and how a firm can be managed, but we can not think about any firm that has no specific operational guidelines to convey its manufacturing process or service process to assure having a product/service that meet customer specifications. Operation management is a key element that provide de operational parameters, guidelines, set ups sheets, work instructions, etc. in order to manage the manufacturing process thru productivity and effectiveness.
- X_8: Social responsibility. Social responsibility is not a typical variable into the TQM equation, however; Social responsibility has been identified in recent years as one of the primarily roles of any organization. The respect of all stake holders is a key for any business environment.
- One idea that arises in this theoretical model is the competitiveness context of the company that influences the mix of key drivers of the TQM model, in such way that some variables can be more significant to another in regards of the competitive environment of the firm.

References

Arawatu, A. (2008). The structural linkages between TQM, Product Quality Performance, and Business Performance: Preliminary empirical study in electronics companies. *Singapore Management Review*. 27 (1), 90 - 93.

Becchetti, L.E. (2011). Corporate social responsibility and shareholder's value. *Journal of Business Research*, doi:10.1016/.

Bernhardt, K.L., Donthu, N., Kennett, P.A., (2000). A longitudinal analysis of satisfaction and profitability. *Journal of Business Research*, 47, 161–171.

Centro de competitividad de Monterrey. (2012, June 23). Premio Nuevo Leon a la Competitividad. Retrieved from http://www.premiocompetitividadnl.com/portal/index.php.

Chi, C. G. (2009). Employee satisfaction, customer satisfaction, and financial performance: An empirical examination. *International Journal of Hospitality Management, 28*, 245-253.

Choi, T., Eboch, K. (1998). The TQM paradox: relations among TQM practices, plant performance, and customer satisfaction. *Journal of Operation Management,* 17, 59–75.

Corredor, P. G. (2011). TQM and performance: Is the relationship so obvious? *Journal of Business Research, 64*, 830-838.

CQM (1993). A special issue on Kano's methods for understanding customer defined quality. *The Center of Quality Management Journal*, 2(4), 3–35.

CQM. (1993). A special issue on Kano's methods for understanding customer defined quality. *The Center of Quality Management Journal*. 2 (4), 3–35.

Creyer, E., Ross, WT. (1997). The influence of firm behavior on purchase intention: do consumers really care about business ethics? *Journal of Consumer Marketing,*14(6), 421–8.

Cristiano, J. J., Liker, J. K., & White, C. C. III, (2000). Customer-driven product development through quality function deployment in the US and Japan. *Journal of Product Innovation Management*, 17, 286–308.

Curkovic, S., Melnyk, S., Calantone, R., (2000). Validating the Malcolm Baldrige National Quality Award framework through structural equation modelling. *International Journal of Production Research*, 38 (4), 765–791.

Davis T. (1997). Breakdowns in total quality management. *International Journal of Management*, 14(1),13–23.

Deming, E., (1986). *Out of Crisis*. Center for Advanced Engineering Study, Cambridge, MA.

Dinesh, S., Tripathi, D. (2006). A critical study of TQM and TPM approaches on business performance of Indian manufacturing industry. Total Quality Management. 7 (17), 811–824.

Doh, JP., Howton, SD., Howton, SW., Siegel, DS. (2010). Does the market respond to an endorsement of social responsibility? The role of institutions, information, and legitimacy. *Journal of Management* , 36(6): 1461–85.

Douglas, T.J. & Judge, W.Q. (2001). Total quality management implementation and competitive advantage: the role of structural control and exploration. *Academy of Management Journal*, 44(1), 158–169.

EFQM. (2012, June 23). EFQM Shares that works. Retrieved from http://www.efqm.org/en/tabid/392/default.aspx

Fornell, C., & Wernerfelt, B. (1987). Defensive marketing strategy by consumer complaint management: A theoretical analysis. Journal of Marketing Research, 24, 337–346

Freiesleben, J. (2010). Proposing a new approach to discussing economic effects of design quality. *International Journal of Production Economics*, 124(2), 348-359.

Garvin, D.A., (1987). Competing on the eight dimensions of quality. *Harvard Business Review*, 65 (6), 101–109.

Ghobadian, A., Woo, H.S., (1996). Characteristics, benefits and shortcomings of four major quality awards. *International Journal of Quality and Reliability Management*, 13 (2), 10–44.

Gicia, O. N. (2011). The impact of strategic planning activities on Transylvanian. *Procedia Social and Behavioral Sciences, 24*, 643-648.

Govindaluri, S.M.; Cho, B.R. (2007). Robust design modeling with correlated quality characteristics using a multicriteria decision framework. *International Journal of Advanced Manufacturing Technology*, 32(5-6), 423- 433.

Hackman, J., Wageman, R. (1995). Total quality management: empirical, conceptual, and practical issues. *Adm Sci Q*, 40:309–42.

Han, S.B., Chen, S.K., & Ebrahimpour, M. (2007). The impact of ISO 9000 on TQM and Business Performance. *Journal of Business and Economic Studies*. 13 (2). 12-16.

Harter, J.K., Schmidt, F.L., Hayes, T.L., (2002). Business-unit-level relationship between employee satisfaction, employee engagement, and business outcomes: a meta analysis. *Journal of Applied Psychology*, 87 (2), 268–279.

Hauser, J.R., Clausing, D., (1988). The house of quality. *Harvard Business Review*, 66 (3), 63–73.

Hauser, J.R., Clausing, D., (1988). The house of quality. *Harvard Business Review*. 66 (3), 63–73.

Kano, N., Seraku, N., Takahashi, F., & Tsuji, S. (1984). Attractive quality and must be quality. *Quality*, 14(2), 39–48.

Kathawala, Y., Motwani, J., (1994). Implementing quality function deployment: A system approach. *TQM Magazine*. 6 (6), 31–37.

Kaynak, H. H. (2008). A replication and extension of quality management into the supply chain. *Journal of Operations Management*, 26, 468-489.

Koys, D., (2003). How the achievement of human-resources goals drives restaurant performance. *Cornell Hotel and Restaurant Administration,* 44 (1), 17–24.

Lakshman, C. (2006). A theory of leadership for quality: Lessons from TQM for leadership. *Total Quality Management*, 17(1), 41-60.

Lee, S.M., Rho, B.H., Lee, S.G., (2003). Impact of Malcolm Baldrige National Quality Award criteria on organizational quality performance. *International Journal of Production Research*, 41 (9), 2003–2021.

McWilliams, A., Siegel, D. (2000). Corporate social responsibility and financial performance: correlation or misspecification? *Strategic Management Journal*, 21 (5), 603-609.

Miller, CC., Cardinal, LB. (1994). Strategic planning and firm performance: a synthesis of more than two decades of research. *Academic Management Journal*, 37, 1649–65.

Moskowitz, MR. (1972). Choosing socially responsible stocks. *Business and Society Review*, 1(1): 71–5.

Pang, J., Zhang, G., Chen, G. (2011). Application of aggregate analysis for product design quality using QFD model and TOPSIS. *MECHANIKA*, 17(6), 661-664.

Park, Y., Sungjoo, L. (2011). How to design and utilize online customer center to support new product concept generation. *Expert Systems with Applications*, 38, 10638 – 10647.

Pearce, JAI., Freeman, EB., Robinson, RB. (1987). The tenuous link between formalized strategic planning and financial performance. *Academic Management Journal*, 12, 658–75.

Prakash, O. G. (2008). Customer satisfaction driven quality improvement target planning for product development in automotive industry. *International Journal of Production Economics, 113*, 997-1011.

Rhyne, LC. (1986). The relationship of strategic planning to financial performance. *Strategic Management Journal*, 7(5), 423–36.

Rudd, J. et. al. (2008). Strategic planning and performance: Extending the debate. *Journal of Business Research, 61*, 99-108.

Samson, D., Terziovski, M. (1999). The relationship between total quality management practices and operational performance. *Journal of Operations Management*, 17, 393-409.

Saraph, J.V., Benson, G.P., Schroeder, R.G. (1989). An instrument for measuring the critical factors of quality management. *Decision Sciences*, 20, 810–829.

Schroeder, R.G., Linderman, K., Zhang, D. (2005). Evolution of Quality: First fifty issues of production and operations management. *Production and Operation Management POMS*. 14 (4), 468–481.

Sharma, J.R.; Rawani, A.M. (2007). Ranking customer requirements in QFD by factoring in their interrelationship values. *Quality Management Journal*, 14(4), 53-60.

Sila, I. (1997). Examining the effects of contextual factors on TQM and performance through the lens of organizational theories: an empirical study. *Journal of Operation Management*, 25, 83-109.

Su, C., Chen, Y., & Sha, D. Y. (2006). Linking innovative product development with customer knowledge: A data-mining approach. *Technovation*, 26(7), 784–795.

The National Institute of Standards and Technology (NIST). (2012, June 23). Baldridge performance excellence program. Retrieved from http://www.nist.gov/baldrige/.

Yong, J., Wilkinson, A., (2001). Rethinking total quality management. *Total Quality Management*, 12 (2), 247–258.

Zakuana, N.M., Yusofb, S.M., Laosirihongthongc, T. & Shaharounb, A.M. (2010). Proposed relationship of TQM and organisational performance using structured equation modeling. *Total Quality Management*. 21 (2), 185–203

Zehira, C. et. al. (2012). Leadership performance management. *Social and Behavioral Sciences*, 41, 20-36.

8
The exchange rate as a factor of competitiveness. Mexico 1991-2012

Carlos Gómez Chiñas[1]

Abstract

The aim of this paper is to analyze the impact of the real exchange rate on the trade balance and the level of economic activity. The work is integrated in addition to one introduction, four other sections. In the second section reviews some fundamental concepts, and distinguishes between real exchange rate and nominal one hand and the real exchange rate and bilateral or multilateral real effective exchange rate on the other. In the third section describes in graphic support, the behavior of the trade balance and the real exchange rate in the period 1991-2012, both bilateral and multilateral. The fourth section describes the variables used; the relationship between them, the model estimated by ordinary least squares method. We also analyze the results. Finally, the fifth section concludes.

Keywords: Real exchange rate, trade balance, competitiveness.

1. Universidad Autónoma Metropolitana-Azcapotzalco

Introduction

International competitiveness, especially referring to the national level, is not an easy concept to define. It is a combination of advantages in price, quality, product design, reliability, sales force, delivery, after-sales service, etc.., which can result in a higher power of sale of a firm or country over its competitors. International competitiveness is materialized in greater economic welfare of a nation through increased trade. It is widely accepted that the basis of an increase in competitiveness is increased productivity. A stable nominal exchange rate is the most important condition in order for improvements in domestic productivity to become gains in international competitiveness. Movements in the exchange rate alter the relative competitive position of companies in different countries. This implies that a currency appreciation can blend international competitiveness improvements achieved by innovative companies on the basis of increases in labor productivity if the variation in the exchange rate exceeds the productivity gains (UNCTAD, 2004).

A low level of competitiveness can cause severe and chronic trade deficit. In the long run a current account deficit can cause a depreciation of the domestic currency.

Being a complex concept, competitiveness is not easy to measure. The trade balance can be sometimes used as an indicator of competitiveness because in normal circumstances, improved competitiveness should result in higher exports and replacing imports. Thus, the more open the economy of a country is, the greater its competitiveness, that is if it has a positive trade balance. The retribution of domestic factors would more than proportionally improve the trade balance, if the degree of openness increases (Ingaramo, 2004).

However, the trade balance does not always adequately reflect whether an economy is competitive or not. Thus, a country can have trade deficit and still be highly competitive if you are importing and incorporating modern technology in its production system (Dang, 2009).

Although international competitiveness is an essentially microeconomic phenomenon, macroeconomic instruments, such as the exchange rate may also play a central role in the international competitiveness of an economy. In principle, the currency depreciation improves international competitiveness, as domestic prices of exported goods fall in foreign currency terms, lowering the price of its exports. However, studies show that the depreciation of the domestic currency does not necessarily

favor international competitiveness in the long term. Moreover, in some cases depreciation can initially worsen the trade balance rather than improve it (J curve). In other cases, the trade balance initially improves, then worsens, and ultimately improves again. Similarly, an appreciation of the currency will not necessarily lead to a decline in exports since the increase in domestic prices of exported goods may be offset by domestic input substitution by cheaper imported inputs (Dang, 2009).

When a country is vertically specialized, the volume of exports depends on the volume of imports, as some of their exports are manufactured using imported inputs. In these circumstances, the trade balance should be less sensitive to changes in the real exchange rate in countries that are more vertically specialized. A closer co-movement between exports and imports should reduce the trade balance response to variations in the real exchange rate (Kharroubi, 2011).

The aim of this paper is to analyze the impact of the real exchange rate on the trade balance and the level of economic activity. The work is integrated, in addition to this introduction, by four other sections. The second section reviews some fundamental concepts and distinguishes real exchange rate from nominal one hand, and the real exchange rate and bilateral or multilateral real effective exchange rate on the other. The third section describes in graphic support, the behavior of the trade balance and the real exchange rate during the period of 1991-2012, both bilaterally and multilaterally. The fourth section describes the variables used, the relationship between them, and the model estimated by the ordinary least squares method (OLS). We also analyze the results. Finally, the fifth section states the conclusions.

Some basic considerations

Only productivity growth and technological improvement can ensure better results in the current account balance of developing countries. This can be achieved with a national development strategy that achieves an increased stock of physical and human capital, allowing the use of more efficient technologies, and shifts resources from traditional low-productivity activities to activities that offer a high potential for growth productivity. Under certain circumstances, particularly when a period of real appreciation has hampered export performance, a real depreciation

of the currency can improve international competitiveness and boost exports.

The exchange rate has been widely recognized as an important policy instrument for internationally competitive domestic entrepreneurship and provides incentives to invest in non-traditional export sectors (UNCTAD, 2004).

The role of exchange rate policy is to establish the relative prices of tradable items in terms of non-tradable ones. Under a flexible exchange rate where international trade is possible, it is more likely that changes in the exchange rate affect tradable items. Non-tradable items are stiffer. Basically, the exchange rate affects international competitiveness by making goods cheaper or more expensive. A depreciation of the domestic currency makes domestic goods cheaper in terms of foreign currency and foreign goods more expensive in domestic currency. It is expected that the trade balance is affected correspondingly. Thus, according to the basic theory, an appreciation would affect the trade balance adversely while depreciation would affect it positively, as long as it complies with the Marshall-Lerner condition, which states that currency depreciation will improve the trade balance only if exports and imports are sufficiently elastic.

In reality, changes in the exchange rate may or may not impact the trade balance. The effects, if any, may be different in the short and long term. Many researchers have studied a pattern in which depreciation worsens the overall balance of payments due to the low elasticity of demand for exports and imports. The inelastic demand reflects pre-existing contracts for imported goods that importers signed before depreciation. The depreciation makes imports, whose contracts have already been signed, more expensive, resulting in higher import values. This would explain the worsening of the trade balance. In the long run, domestic consumers shift their demand from more expensive imported goods to relatively cheaper domestic goods. Similarly, foreign consumers substitute domestic goods for relatively cheaper foreign goods. Thus, the trade balance will improve with time (Dang, 2009).

Nominal Exchange Rate, Real and Effective

The nominal exchange rate and the real exchange rate are two relative prices associated with the existence of open economies with different

currencies. The nominal exchange rate is the relative price of one currency against another. It is defined as the number of units of domestic currency per unit of foreign currency, or, alternatively, as the price of a unit of foreign currency in domestic currency terms. When the price falls, it is said that there has been an appreciation of the domestic currency. Conversely, if it increases, there has been a depreciation or devaluation of the domestic currency.

A decrease (increase) of the nominal exchange rate is then equivalent to an appreciation (depreciation) of the domestic currency.

The real exchange rate is the price of foreign goods in terms of domestic goods. If the price of foreign goods is P * and domestic goods is P, the real exchange rate is equal to: TCR = EP * / P, where E is the nominal exchange rate. The real appreciation is a decrease in the real exchange rate and means that domestic goods are relatively more expensive or the prices of foreign goods, in terms of domestic goods, have declined. The real depreciation is an increase in the real exchange rate and means that foreign goods prices are relatively higher or domestic goods are relatively cheaper, so the real exchange rate affects the allocation of resources in the economy.

Purchasing Power Parity (PPP)

This concept was developed in 1914-1918, by Gustav Cassel. The purchasing power parity, or PPP, is nothing more than a reformulation of the "law of one price" as a homogeneous product which should have the same price internationally. If P is the domestic price quoted in local currency and P* is the foreign price for the same good, but quoted in foreign currency, then the PPP, states that:

$$P = EP^*$$

Or alternately:

$$E = P / P^* \qquad (1)$$

Where e is an index number.

The PPP holds if and only if there are no information costs, transportation costs and other restrictions on international trade (tariffs, quotas, etc.). Obviously, this is a very restrictive assumption (Félix Jiménez, 1998). The less restrictive version or relative of PPP states that:

TCEt = TCN in a base period * (IPT / IPT *). (2)

Where TCEt is the real exchange rate equilibrium. It is assumed that in the base period the current account was in balance. Thus, this rate is calculated by taking into account the inflation differential and not just the price relationship between two countries.

The expression (2) can be written as follows:

$$Q_t^{PPA} = \frac{S_0^{PPA}}{S_t^{PPA}} \frac{IP_t^*}{IP_t} \quad (3)$$

Where Q_t^{PPA} is the real exchange rate according to PPP.

As there is no information about S_0^{PPA} and S_t^{PPA}, in practice we use the following expression

$$Q_t = \frac{S_0}{S_t} \frac{IP_t}{IP_t^*} \quad (4)$$

Where S_0 and S_t are the nominal exchange rate in period 0 and t, respectively.

If the real exchange rate thus obtained, Q_t, were constant and equal to one, it seems that it meets the relative version of PPP. The hope is that Q will oscillate around one, so that it always tends to return to that value every time (Alonso, 2003).

One of the objectives of the theory is to predict trends in the real world. International experience, since the adoption of the system of flexible exchange rates at the beginning of the seventies of the last century, can test the predictive power of the various theories on the exchange rate.

What is the desired precision that theories have to predict changes in exchange rates? Clearly we cannot expect a perfect forecast, but we can provide a useful model to at least overcome the naive model that says the exchange rate provided for in the future is just the same as the current spot rate. The naive model is equivalent to saying that the spot exchange rate follows a random walk, so that no one can predict if it will rise or

fall. Presumably, the predictions of any useful structural economic model should be better than the naive model (Pugel, 2004).

However, at present there is a consensus that structural economic models are of little use to predict changes in exchange rates in the short term, ie for periods less than one year. Frankel and Rose, 1995 (cited by Pugel, 2004), reviewed many studies using various models based on economic fundamentals, such as money supply and real income, interest rates, expected rates of inflation, the balance of the trade balance and current account. They conclude that structural models can not accurately overcome a naive random walk alternative to reduce prediction horizons. However, economic fundamentals emphasized by the PPP and the monetary approach are valuable for forecasting exchange rates to a year or more.

From the above, one may ask, why is it so difficult to predict the spot exchange rates using economic models? There are at least two reasons for this.

First, the exchange rate strongly and immediately reacts to new information. Since new information is unexpected, it cannot be incorporated into any prediction. The reaction to such news usually produces large movements in the exchange rate: the current changes in the exchange rate seem to overreact movements with smoother adjustments in exchange rates of long-run equilibrium, as given by the PPP or monetary approach.

The second reason is that expectations of exchange rates can be formed without reference to economic fundamentals. Many participants in the forex market tend to extrapolate the past month. Because the actions of investors can influence their expectations, recent trends in exchange rates can be reinforced and persist for some time. If the resulting variations in the exchange rates are incompatible with any form of economic fundamentals, they are called speculative bubbles. The possibility that occasional bubbles may exist in the currency market suggests that there is some economic inefficiency in this market (Pugel, 2004).

The real effective exchange rate (REER) is a measure of domestic price competitiveness vis-a-vis its trading partners. The evolution of the REER is often a good predictor of the emergence of a crisis in the balance of payments. It has two components: the "real" and "effective".

The bilateral real exchange rate of country i to country j, e^{ij}, is calculated as the ratio of the nominal exchange rate E^{ij}, divided by the ratio of the price index for domestic and foreign (p^i/p^j):

$$e^{ij} = \frac{E^{ij}}{p^i/p^j} = \frac{E^{ij}p^j}{p^i} \tag{5}$$

The REER is simply a weighted average of the bilateral real exchange rates, weighted by trade with each partner.

Be it $\gamma_t^{ij} = \frac{X_t^{ij}}{X_t^i} = \frac{M_t^{ij}}{M_t^i}$, the share of country j in country i's trade, including exports and imports. Then:

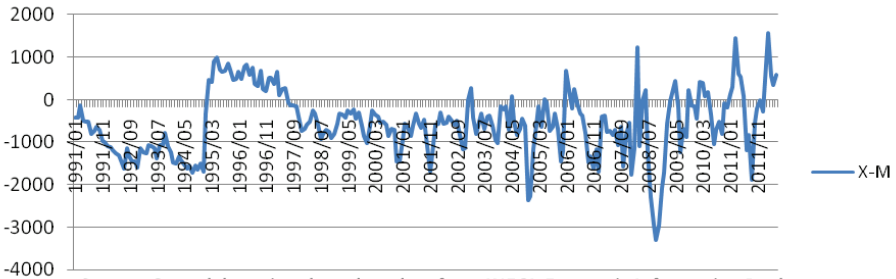
$$e_t^i = \sum_{j=1}^{n} \gamma_t^{ij} \, e_t^{ij} \tag{6}$$

REER calculations are time consuming but are included in the International Financial Statistics of the International Monetary Fund and World Development Indicators of the World Bank. Historically, substantial and prolonged episodes of appreciation of a currency as measured by the REER, have often been early warnings of crises (UNCTAD-WTO, 2012).

Exchange and trade balance: a first approach

This section provides a brief description of the evolution of the trade balance and the exchange rate in Mexico. It can be seen in graph 1 that Mexico's trade balance during the period of January 1991-June 2012, has been largely lacking. And, from January 1991 to January 1995, it was persistently lacking. From February 1995 to June 1997, it showed a fluctuating surplus. In July 1997, a new period of deficit covered the country until January 2010, with a sporadic surplus in February 2003, May 2004, May 2005, January, February and April 2006, June 2008 and April-May, September 2009. In February-May 2010, there was a brief period of surplus, followed by a deficit spanning from June 2010 to December of that year. In the first half of 2011 the trade balance was in surplus. From July 2011 until January 2012, the trade balance deficit came again. From February 2012 to June of the same year, it showed a new account surplus. We can say that after the 2008-2009 crises, Mexico's trade balance has experienced an improvement, but slight improvement nonetheless.

Graph 1
Mexico: Tade balance, 1991-2002
(millions dollars

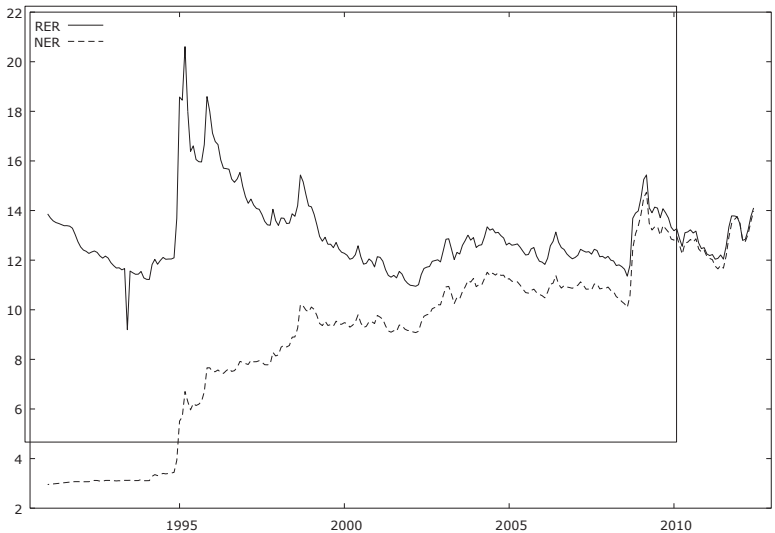


Source: Own elaboration, based on data from INEGI. Economic Information Bank. www.inegi.org.mx

Graph 2 shows the evolution of the series of nominal exchange rate and the real exchange rate. It is noted that from January 1995, there is a convergence trend between the two exchange rates. This means, given the large difference between the two, that the real exchange rate, which is the line that consistently appears at the top, has a tendency to fall while the nominal exchange rate has a tendency to rise, without an apparent relationship between the two. Starting from September 1998, you can begin to see certain synchronization between the two series, with March 2003 being the narrowest, meaning that when one increases, so does the other. Based on Graph 2, we can say that at least since October 2008, there has not been a big problem of exchange rate misalignment.

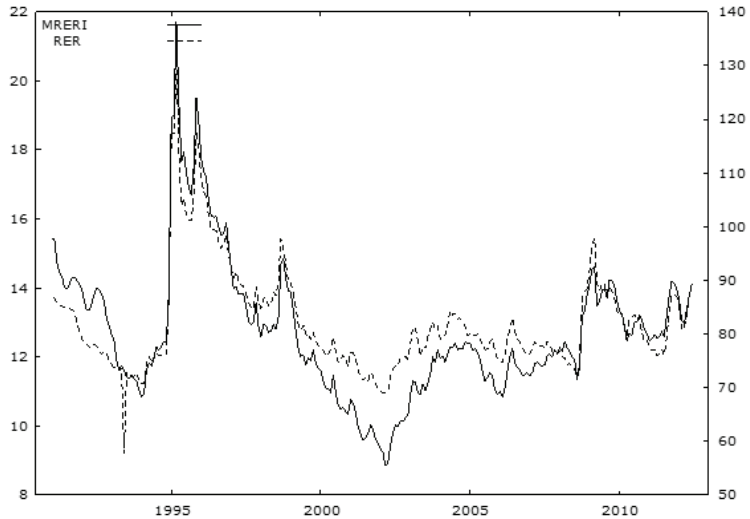
To conclude this first approach to the performance of the exchange rate, Graph 3 shows the evolution of the real bilateral exchange rate peso / dollar, calculated as mentioned in the next section, and the index of the real exchange rate that corresponds to the concept of the real effective exchange rate, as defined in the previous section. This calculation is done by the Bank of Mexico and is an index that considers 111 countries. This graph shows that both rates were closely correlated, ie, when one goes up, so does the other and vice versa. You can see also the overshooting of the exchange rate during the financial crisis of 2008-2009.

Graph 2
Mexico: Real and nominal exchange rate, 1991-2012



Source: Own elaboration, based on data from INEGI and BLS.

Graph 3
Mexico: Multilateral real exchange rate index and bilateral real exchange rate



Source: Owen elaboration, based on data from INEGI and BLS.

The model

a) Description of the variables used and the relationships between them

The variables used are the trade balance in real terms, the real exchange rate, the growth rate of the overall indicator of economic activity, and the growth rate of the Industrial Production Index (IPI) in the United States. We used monthly data for the period of January 1993-June 2012. The trade balance calculation was based on data published by the National Institute of Statistics and Geography (INEGI) in the Economic Information Bank (EIB). The current dollar series was deflated by the general price index of exports and imports. The calculation of the real exchange rate was made based on the following expression: TCR = EP * / P, where E is the nominal exchange rate, P * is the consumer price index of the United States (CPI), P is the national index of consumer prices in Mexico (CPI). Both series of nominal exchange rate and the CPI were obtained from the BIE. The series of the consumer price index of the US Consumer Price Index (CPI), was obtained from the website of Bureau of Labor Statistics Department of Labor of the United States.

Data from Global Indicator of Economic Activity (IGAE) was obtained from the BIE and the index of industrial production in the United States (IPI) was obtained from www.econstats.com.

All rates were adjusted to the base period, December 2011, and it was during that period that the trade balance, in current dollars, was roughly in balance, as the deficit was $ 584,000.

The model is specified as follows:

$$BCR = \beta_0 + \beta_1 TCR + \beta_2 IGAETASA(-1) + \beta_3 IPITASA + \mu \qquad (7)$$

Where BCR is the trade balance deflated by the general price index of exports and imports; TCR is the real exchange rate; IGAETASA is the growth rate of a global economic activity indicator, which shows the evolution of economic activity in the country and is considered an indicator of the trend or direction of economic activity in the country in the short term; IPITASA is the growth rate of the index of industrial production in the United States; μ represents the disturbance or error term, acting as a random variable that replaces all those variables that are not included in the model but which together affect the dependent variable.

It is assumed that there is a positive relationship between the real exchange rate and the trade balance because when the first increases, so do exports and imports, on the contrary, become more expensive and therefore decrease. Similarly, it also assumes a positive relationship between the index of industrial production in the United States and the trade balance, since most of Mexico's exports are directed to the US market and the highest percentage of these exports consists of manufactured products. Therefore, hopefully when you increase the level of industrial activity in the United States, Mexican exports also increase with consequent positive impact on the trade balance.

Furthermore, we assume a negative relationship between the overall index of economic activity and trade balance, as the level of economic activity increased imports, both as final consumption of intermediate and capital goods, thus deteriorating the trade balance.

b) Estimation model and results analysis

The estimate was made with version 7 of the E-Views econometrics package.

Before estimating the equation, in order to ensure that no spurious relationship was obtained, we proceeded to perform the unit root test of Dickey-Fuller.

Based on the results in Table 1, it can be said that the series of deflated trade balance, the real exchange rate, the growth rate of the index of industrial production in the United States, and the growth rate of the indicator global economic activity are stationary. Therefore, we can use the method of ordinary least squares (OLS) to estimate a regression between these variables. The results of this estimation are presented below.

The estimated regression is:

$$BCR = -5521.340 + 494.901\ TCR - 25.57155 IGAETASA(-1) + 65.03624 + \mu \quad (8)$$

According to the results in Table 2, there is an autocorrelation, since the Durbin-Watson statistic is significantly less than 2, the coefficient of determination is very low, and the coefficients of the growth rates of IPI and IGAE and are not statistically significant.

Table 1
Test of root unitary Dickey-Fuyller Augmented

Null Hypothesis: BCR has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic - based on SIC, maxlag=14)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-3.283492	0.0168
Test critical v	1% level		-3.45847	
	5% level		-2.873809	
	10% level		-2.573384	
Null Hypothesis: TCR has a unit root				
Exogenous: Constant				
Lag Length: 1 (Automatic - based on SIC, maxlag=14)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-3.089001	0.0288
Test critical v	1% level		-3.458594	
	5% level		-2.873863	
	10% level		-2.573413	
Null Hypothesis: IPITASA has a unit root				
Exogenous: Constant				
Lag Length: 14 (Automatic - based on SIC, maxlag=14)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-3.560507	0.0073
Test critical v	1% level		-3.460313	
	5% level		-2.874617	
	10% level		-2.573817	
Null Hypothesis: IGAETASA has a unit root				
Exogenous: Constant				
Lag Length: 12 (Automatic - based on SIC, maxlag=14)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-3.137186	0.0253
Test critical v	1% level		-3.460035	
	5% level		-2.874495	
	10% level		-2.573751	
Source: The Authors.				

According to the results in Table 2, there is an autocorrelation, since the Durbin-Watson statistic is significantly less than 2, the coefficient of determination is very low, and the coefficients of the growth rates of IPI and IGAE and are not statistically significant.

Dependent Variable: BCR					
Method: Least Squares					
Sample (adjusted): 1993M03 2012M06					
Included observations: 232 after adjustments					
Variable	Coefficient	Std. Error	t-Statistic	Prob.	
C	-5521.34	842.5162	-6.553394	0	
TCR	494.9901	64.05429	7.727665	0	
IGAETASA(-1	-25.57155	30.02272	-0.85174	0.3953	
IPITASA	65.03624	50.16101	1.29655	0.1961	
R-squared	0.219022	Mean dependent var		943.1122	
Adjusted R-s	0.208746	S.D. dependent var		1738.371	
S.E. of regres	1546.323	Akaike info criterion		17.54224	
Sum squared	5.45E+08	Schwarz criterion		17.60167	
Log likelihoo	-2030.9	Hannan-Quinn criter.		17.5662	
F-statistic	21.31391	Durbin-Watson stat		0.212704	
Prob(F-statis	0				
Source: The authors.					

According to Perez (2007:127), the fundamental problem when there is autocorrelation in a model is that the OLS estimators are not efficient. For the DW statistic value, we know that the autocorrelation is positive. Thus, the first step in correcting the problem of autocorrelation is detecting order, which is used for the residual correlogram, which is presented in Figure 1.

As shown in Figure 1, residues have a first order autoregressive structure AR (1), so we estimated the following model:

$$BCR = \beta_0 + \beta_1 TCR + \beta_2 IPITASA(-1) + \beta_3 IGAETASA(-1) + AR(1) + \mu \quad (9)$$

The results are presented in Table 3. The resulting estimate is:

$$BCR = -2680.259 + 285.2424\, TCR - 21.57211\, IGAETASA(-1) \\ 39.01516\, IPITASA + 0.903999\, AR(1) + \mu \quad (10)$$

This new regression has a better goodness of fit and has no problems of autocorrelation, as shown in Table 3.

Figure 1. Correlogramof waste.						
Sample: 1993M03 2012M06						
Included observations: 232						
Autocorrelat	Partial Correlation		AC	PAC	Q-Stat	Prob
.|******	.|******	1	0.892	0.892	187.08	0
.|******	.|*	2	0.825	0.141	347.64	0
.|******	.|.	3	0.769	0.057	487.96	0
.|*****	*|.	4	0.689	-0.128	601.01	0
.|*****	.|.	5	0.624	-0.005	694.1	0
.|****	.|*	6	0.59	0.125	777.72	0
.|****	.|.	7	0.55	0.022	850.76	0
.|****	.|*	8	0.547	0.17	923.18	0
.|****	.|.	9	0.548	0.063	996.32	0
.|****	.|.	10	0.537	-0.011	1066.9	0
.|****	.|*	11	0.551	0.106	1141.4	0
.|****	.|.	12	0.545	-0.036	1214.8	0
.|****	*|.	13	0.498	-0.165	1276.3	0
.|***	*|.	14	0.448	-0.131	1326.2	0
.|***	.|*	15	0.42	0.098	1370.5	0
.|***	.|*	16	0.392	0.098	1409	0
.|***	.|*	17	0.381	0.095	1445.6	0
.|***	.|.	18	0.365	-0.045	1479.4	0
.|***	.|.	19	0.371	0.06	1514.6	0
.|***	.|.	20	0.39	0.058	1553.6	0
.|***	.|.	21	0.394	-0.035	1593.5	0
.|***	.|.	22	0.401	0.025	1635.1	0
.|***	.|.	23	0.406	-0.017	1677.9	0
.|***	.|.	24	0.386	-0.05	1716.8	0
.|**	*|.	25	0.342	-0.101	1747.4	0
.|**	*|.	26	0.294	-0.067	1770.1	0
.|**	.|.	27	0.245	-0.049	1786.1	0
.|*	.|.	28	0.204	-0.058	1797.1	0
.|*	.|*	29	0.186	0.095	1806.4	0
.|*	.|*	30	0.19	0.147	1816.2	0
.|*	.|.	31	0.19	-0.027	1826	0
.|**	.|*	32	0.222	0.08	1839.3	0
.|**	.|.	33	0.243	0.004	1855.4	0
.|**	.|.	34	0.267	0.073	1874.9	0
.|**	.|.	35	0.283	-0.013	1896.9	0
.|**	.|.	36	0.29	0.039	1920.2	0
Source: The authors.						

The value of the Durbin-Watson statistic (2.126931) means no autocorrelation. The coefficient of determination of 0.847152 means that 84.7% of the variations in the trade balance and is explained by variations in the independent variables. The F statistic indicates that the parameters are set equal to zero.

.|* |	.|* |	29	0.186	0.095	1806.4	0
.|* |	.|* |	30	0.19	0.147	1816.2	0
.|* |	.|. |	31	0.19	-0.027	1826	0
.|** |	.|* |	32	0.222	0.08	1839.3	0
.|** |	.|. |	33	0.243	0.004	1855.4	0
.|** |	.|. |	34	0.267	0.073	1874.9	0
.|** |	.|. |	35	0.283	-0.013	1896.9	0
.|** |	.|. |	36	0.29	0.039	1920.2	0
Source: The authors.						

All coefficients are statistically significant and the signs were as expected. So, an increase in the real exchange rate on the trade balance improved to 285.2424 million dollars during December 2011. When the IGAE percentage point increases in the trade, balance deteriorates in 21,572,110 of dollars during December 2011, and to an increase in the growth rate of the index of industrial production in the US trade balance, which improved by 39,015,160 of dollars at December 2011.

To verify the absence of autocorrelation using the Breusch-Godfrey. The results are presented in Table 4. The values for F (0.2084) and the Chi-square (0.2027) are greater than 0.05, which can accept the absence of autocorrelation.

Table 4
Serial correlation test LM of Breush-Godfrey

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	1.591666	Prob. F(1,225)	0.2084
Obs*R-squared	1.622632	Prob. Chi-Square(1)	0.2027
Fuente: The authors.			

Once the absence of autocorrelation is verified, it proceeds to test heteroskedasticity White. The results are presented in Table 5. In this table, the p-values of the F and the cross terms are greater than 0.05, allowing no heteroscedasticity accept 95%.

Table 5
Heteroscedasticity test

Prob(F-statistic)	0.90166		
F-statistic	1.609406	Prob. F(4,226)	0.1728
Obs*R-squared	6.397808	Prob. Chi-Square(4)	0.1713
Scaled explained SS	10.46469	Prob. Chi-Square(4)	0.0333
Source: The authors.			

Now we interested in determining the direction of the relationship between the variables, if there is a causal link between them and the direction of it. This is done with the Granger causality test, which only makes sense if the variables are cointegrated. So first, you have to determine if cointegration between variables for which proceeds to the unit root test to the residuals. The results are presented below in Table 6.

Table 6
Causality test of Granger

Null Hypothesis: RESID03 has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic - based on SIC, maxlag=14)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-16.12655	0
Test critical values:	1% level		-3.458719	
	5% level		-2.873918	
	10% level		-2.573443	
*MacKinnon (1996) one-sided p-values.				
Source: The authors.				

Table 6 shows that the null hypotheses of a unit root, so that the variables cointegrate, which can proceed with the Granger causality test. The results are presented in Table 7.

Sample: 1993M02 2012M06			
Lags: 5			
Null Hypothesis:	Obs	F-Statistic	Prob.
TCR does not Granger Cause BCR	228	2.31061	0.0452
BCR does not Granger Cause TCR		1.43926	0.2113
IGAETASA does not Granger Cause BCR	228	5.49518	9.00E-05
BCR does not Granger Cause IGAETASA		2.87054	0.0157
IPITASA does not Granger Cause BCR	228	3.41926	0.0054
BCR does not Granger Cause IPITASA		3.82731	0.0024
IGAETASA does not Granger Cause TCR	228	2.21744	0.0537
TCR does not Granger Cause IGAETASA		3.82319	0.0024
IPITASA does not Granger Cause TCR	228	1.00019	0.4185
TCR does not Granger Cause IPITASA		2.56113	0.0282
IPITASA does not Granger Cause IGAET	228	9.40848	4.00E-08
IGAETASA does not Granger Cause IPITASA		26.8152	4.00E-21
Source: The authors.			
Cuadro 7. Pruebas de causalidad de Granger.			
Pairwise Granger Causality Tests			

Based on these results, we cannot reject the hypothesis that the trade balance does not cause in the sense of Granger to real exchange rate, while if you can reject the hypothesis that the real exchange rate does not cause the effect Granger to the trade balance, we can say that the causality runs the real exchange rate to the trade balance.

There is bidirectional causality in the Granger sense, between the growth rate of the overall index of economic activity and trade balance, as well as between the trade balance and the growth rate of the index of industrial production in the United States.

On the other hand, we cannot reject the hypothesis that the rate of growth of the overall index of economic activity does not cause in the Granger sense to real exchange rate. But we can reject the hypothesis that the real exchange rate causes in the Granger sense to the growth rate of the overall index of economic activity, so that the causality runs the real exchange rate to the growth rate of the overall index of economic activity.

We cannot reject the hypothesis that the growth rate of the index of industrial production in the United States is due to the effect of Granger to real exchange rate, but the hypothesis that the real exchange rate does not cause the Granger sense, the growth rate of the index of industrial production in the United States, so that the causality runs the real exchange rate to the growth rate of the index of industrial production in the United States.

Finally, there is bidirectional causality in the Granger sense between the growth rate of the overall index and the growth rate of the index of industrial production in the United States.

Conclusions

The exchange rate, in all its forms (nominal, real or equilibrium) is one of the key macroeconomic prices. Their variations cause significant changes in the signal system of the economy. Of particular importance is the real exchange rate, which is a determinant of the competitiveness of the economy.

The real exchange rate is an important determinant of the real trade balance. In this case, it was found that the causality runs the real exchange rate to the trade balance. That is a real depreciation of the cur-

rency leads to an improvement in the trade balance. In addition, there is bidirectional causality between the growth rate of the overall indicator of economic activity and the real trade balance. This means that an increase in the growth rate of the overall indicator of economic activity causes changes in the real trade balance, but also changes in the real trade balance induce changes in the growth rate of global economic activity indicator. There is also bidirectional causality between the growth rate of industrial production index of the US trade balance and real.

In the case of Mexico, the real depreciation of the currency has no contractionary effects, but with increasing real exchange rate, so does the growth rate of the overall indicator of economic activity, the type causality going real exchange global indicator of economic activity. This confirms the importance of the real exchange rate as a determinant of competitiveness.

References

Alonso, J. y Maeso, F. (2003). Balanza de pagos, equilibrio externo y tipo de cambio. En Alonso, J. (Ed.), *Lecciones sobre economía mundial*, *introducción al desarrollo y a las relaciones económicas internacionales* (206-232). Madrid: Thomson Civitas.

Dang Trung, L. (2009). Trade competitiveness and exchange rate policies: Recent issues and lessons for developing economies, *ARTNeT GMS NOTES,* Asia-Pacific Research and Training Network on Trade, Brief No. 2. Recuperado de http://www.unescap.org/tid/artnet/mtg/GMS%20Notes%20No.%202%20-%20Trung.pdf

Econstats. Industrial ProductionIndex. Recuperado de www.econstats.com.

Ingaramo, J. (2004). Reflexiones sobre tipo de cambio real y competitividad. Datos sobre el agro argentino. *Agro claves*, 1(3), 24-33.

Instituto Nacional de Estadística y Geografía (INEGI), Banco de Información Económica. http://www.inegi.org.mx/sistemas/bie/

Jiménez, F. (1998), *Notas sobre la determinación y dinámica del tipo de cambio*. Documento de Trabajo 158. Lima: Pontificia Universidad Católica del Perú.

Kharroubi, E. (2011). The trade balance and the real exchange rate. *BIS Quaterly Review*, September, 33-42.

Pugel, T. (2004). *Economíainternacional*. Madrid: McGraw-Hill.

UNCTAD (2004), *Trade and development report 2004*. New York: United Nations.

United Nations and World Trade Organization (2012), *A Practical guide to trade policy analysis*, New York: United Nations.

United States Department of Labor (2012).Bureau of Labor Statistics**.** Consumer Price Index - All Urban Consumers**.** Recuperado dehttp://data.bls.gov/cgi-bin/surveymost

9
Financial decision making under uncertainty conditions

Gerardo G. Alfaro Calderón[1]
Víctor G. Alfaro García[2]

Abstract

Any investment project can be evaluated according to the dimension that give temporary financial flows of funds established according to the financial pro forma statements of the project in terms of time. The aim of this study is to conduct a comparison of the evaluation under conditions in which the information used is deterministic or considered perfect, thereby classic criteria. We compare the above with an assessment when flows cannot be estimated with certainty; this triggers the development of models using techniques based on the theory of fuzzy subsets. The financial evaluation is performed using the Net Present Value criteria and the Breakeven Analysis.

Keywords: Classical financial evaluation, fuzzy sets, VAN, BEP.

1. Facultad de Contaduría y Ciencias Administrativas -Universidad Michoacana de San Nicolás de Hidalgo
2. Universidad de Barcelona

Introduction

The financial decisions taken in the company through the evaluation of investment financial projects performed, is established as the change of an immediate satisfaction, against a hope that is acquired and in which the asset is the support (Masse, 1963), i.e. "the application of resources that are not going to be consumed in the same cycle" (Gil Aluja 1992). Considering this fundamental premise in justification of this work, we compare two evaluation methods in conditions of uncertainty.

The evaluation of an investment project, whichever it is, is done in order to know their social and economic performance, by doing this we try to solve a human need in an efficient, safe and profitable way. Only then we can allocate scarce economic resources in the best alternative.

Objectives

- Evaluate an investment project financially by classical theory vs. Uncertainty theory. Mainly analyzing the next key indicators:
- Breakeven Point
- Volume of units to produce and to sell
- Sales volume required
- Level of use of the plant.
- Net Present Value

Framework

Breakeven. Since a company starts its productive activities, it supports fixed costs as a result of the acquisition of production equipment, the magnitude of the quantity is matched to the amount of loss if the production process is not started, therefore had not acquired variable costs.

Once the production process, the quantity of goods and services, and the sales increase; if the selling price exceeds the average variable costs, the income absorbs an increasing portion of the fixed costs, reducing the losses steadily until a given volume of production and sales, when revenues cover variable costs and fixed costs. At this point, there is no utility or loss, thus breakeven point.

In this paper, in order to show the contrast between the classical theory and theory of uncertainty in the calculation of the equilibrium point, in it's different meanings; we use data such as variable costs (VC), fixed costs (FC), sales price (SP) and production volume (PV).

Determination of the equilibrium point in their different meanings such as:

- Volume of units to produce and sell
- Sales volume required
- Level of utilization of the plant

Equation for breakeven, in units to produce

$$BE = \left[FC \quad \frac{FC}{SP - \left(\frac{VC}{SP}\right)} \right]$$

The average breakeven volume to produce units for year 1 is $ 1,082,435.81 USD.

To calculate the breakeven in terms of sales:

$$BE = \left[\frac{FC}{1 - \left(\frac{VC}{P*Q}\right)} \right]$$

The average breakeven sales volume for year 1 is $ 5,525,545.17 USD.

For the% of capacity utilized for year 1 we have:

$$\%CA = \left[\frac{BreakevenVol.}{RealProductionVol.} \right] *100$$

The percentage of capacity utilized for year 1 is 47%.

Calculations for years 2, 3, 4, and 5 follow the same procedure; this will be shown in Table # 6.

The equilibrium calculation scheme under uncertainty would be given as follows:

It is necessary to mention that in order to make this calculation we utilize information as a starting point for the calculation in the planning horizon of 5 years, assuming an increase in production at the beginning and end of the year therefore the variation in variable and fixed costs.

Table 1
Fixed and Variable Costs in the planning horizon

	Year 1		*Year 2*	
Costs	*January*	*December*	*January*	*December*
Total variable costs	5,286,669	6,043,663	6,472,424.	7,484,900
Total fixed costs	2,737,398	2,737,398	2,914,139	2,914,139

	Year 3		*Year 4*	
	January	*December*	*January*	*December*
Total variable costs	8,022,462	9,098,354	9,779,070	10,345,066
Total fixed costs	3,104,140	3,104,140	3,403,746	3,403,746

	Year 5	
	January	*December*
Total variable costs	11,089,999.74	11,696,805.19
Total fixed costs	3,620,354.89	3,620,354.89

Source: Self elaboration

In the calculation of the equilibrium point it is at first necessary to calculate the break-even, giving us a confidence interval, where the production under the best operating conditions and production under the most unfavorable conditions in order to cover the variable and fixed costs is stated, yet this interval as the source mentioned Gil A.M. (1993) is not really useful, therefore proposes:

Ask experts express their views, through the Endecadario system, indicating if it goes away or towards the extremes, therefore obtaining the cumulative probabilities, hence obtain an expected value; which corresponds to the equilibrium point. Such process is shown below for:

- Volume of units needed to produce.
- Required minimum sales volume.
- Installed capacity of the plant.

For these calculations it is necessary to use the basic operations with confidence intervals, in which it is noted that:

$[a,b]\ (+)\ [c,d] = [a+c\ ,b+d]$
$[a,b]\ (-)\ [c,d] = [a-d\ ,\ b-c]$
$[a,b]\ (*)\ [c,d] = [a \bullet c\ ,b \bullet d]\ ;$ $a,b,c,d \in R^{+}$
$[a,b]\ (\div)\ [c,d] = [a/d\ ,\ b/c]\ ;$ $a,b,c,d \in R^{+}$ y $c > 0$
$[1,1]\ (\div)\ [c,d] = [1/d,1/c]$ $c,d \in R^{+}$ y $c > 0$

Breakeven calculation with minimum volume production. Year 1.

Table 2
Breakeven calculation

Concepts	*January*	*December*
Sales Price	5.00	5.00
Production	2,115,000.00	2,475,000.00
Variable Costs	5,286,669.84	6,043,663.32
Fixed Costs	2,737,398.80	2,737,398.80

Source: Self elaboration

Equation to use:

$$BE = \left[\frac{FC}{SP - \left(\frac{VC}{VP} \right)} \right]$$

$$Breakeven = \left[\frac{[2737389.00\ ,\ 2,\ 737,389.80]}{[5]\ (-) \left[\frac{5,286,669.84\ ,\ 6,\ 043,663.32}{2,115,000.00\ ,\ 2,\ 475,\ 000.00} \right]} \right]$$

Breakeven minimum production volume = [955,805.09 , 1,277,680.05]

Once this confidence interval is obtained, it is asked to experts express their opinion, through the Endecadario system, this process is shown in the following table:

Table 3
Endecadaria Table

α	
0	For 955,972.69
0.1	Practically 955,972.69
0.2	Almost 955,972.69
0.3	Close to 955,972.69
0.4	Nearer to 955,972.69 than 1,277,904.09
0.5	As close as 955,972.69 as ro 1,277,904.09
0.6	Nearer to 1,277,904.09 than 955,972.69
0.7	Close to 1,277,904.09
0.8	Almost 1,277,904.09
0.9	Practically 1,277,904.09
1	For 1,277,680.05

Source: Self elaboration

For the present case, we considered the opinion of 10 experts having obtained the following information:

Table 4
Experts Opinion

Expert	*Opinion*	*Expert*	*Opinion*	*Expert*	*Opinion*	*Expert*	*Opinion*
1	0	4	0.4	7	0.6	10	0.4
2	0.3	5	0.5	8	0.3		
3	0.2	6	0.3	9	0.3		

Source: Self elaboration

Once we obtain the data, we transform these views through a process of accumulation, noting the number of times that the same opinion repeats and therefore obtaining the cumulative probabilities of the process, we finish by dividing every value of α by the number of experts, yet we obtain:

Table 5
Transformation of estimators

α	*[955,805.09 , 1,277,680.05]*	*N° veces que se repite un opinión*	*Acumulada*	*Probabilidades Acumuladas*
0	9	1	1	0.9
0.1	9	0	1	0.9
0.2	8	1	2	0.8
0.3	4	4	6	0.4
0.4	2	2	8	0.2
0.5	1	1	9	0.1
0.6	0	1	10	0
0.7	0	0	10	0
0.8	0	0	10	0
0.9	0	0	10	0
1	0	0	10	0

With the purpose of decreasing the entropy of the system, we obtain the expected value, this is done by adding the cumulative probabilities for althe α in the Endecadario system, except for α = 0, then, we divide all by the number of experts, in this case 10 so that:

$$\varepsilon = \frac{0.9 + 0.8 + 0.4 + 0.2 + 0.1}{10} = 0.266$$

Now, as we have considered experts opinions, it is necessary to establish an equation for an unknown number in the range [955805.09, 1277680.05], using $\alpha \in = [0,1]$, meaning that this number is estimated by: 955,972.69 + 321874.96 α

Substituting the value of entropy, we obtain:
Breakeven production volume equal to 1,041,591.42.

Calculation of required minimum sales volume.

The equation to use:

$$BE = \left[\frac{FC}{1 - \left(\frac{VC}{P*Q} \right)} \right]$$

$$Breakeven = \left[\frac{[2737389.00 \, , \, 2,\, 737,389.80]}{[1]\,(-)\left[\frac{5{,}286{,}669.84 \, , \, 6{,}043{,}663.32}{[5.5] * [2{,}115{,}000.00 \, , \, 2{,}475{,}000.00]} \right]} \right]$$

The breakeven point for the minimum income required is [4,779,025.44 , 6,388,400.24].

From this range and using the procedure suggested by Gil la Fuente AM (1993), in order to find the breakeven value of the minimum income as shown in the above process and assuming that expert opinions regarding the Endecadario scale was the same, the value of the entropy would be equal to the one calculated in then the previous case, therefore:

The equation for an unknown number in the interval [4,779,025.44 , 6,388,400.24], using $\alpha \in = [0,1]$ thus giving that this number is estimated by: 4,779,863.43 + 1,609,657.00 α

Substituting the value of the entropy with 0.266 we get:
Minimum breakeven sales volume required: $ 5,209,105.30.

Calculation of plant capacity utilized regarding the equilibrium point

This calculation is indispensable in the breakeven analysis because it allows knowing the capacity in which the process is being utilized, the method for calculating this (%), is derived from the calculation of the equilibrium point and can be expressed as follows:

In this calculation we use the obtained interval of the volume of needed units required to produce, as well as the interval of real production volume, this, in addition to the basic operations for intervals.

$$\%CA = \left[\frac{BreakevenVol.}{RealProductionVol.} \right] * 100$$

Table 6

Concept	*January*	*December*
Breakeven	955,805.09	1,277,680.05
Production	2,115,000.00	2,475,000.00

Source: Self elaboration

$$\%CA = \left[\frac{[955{,}805.09 \ , \ 1{,}277{,}680.05]}{[2{,}115{,}000.00 \ , \ 2{,}475{,}000.00]} \right]$$

$$\%CA = [39\% \ , \ 60\%]$$

Considering expert opinions as in the previous cases and considering an entropy equal to 0.266 with an equation for the unknown number of the previous interval:

$$0.39 + 0.22 \, \alpha$$

The (%) of the utilized capacity = 0.44.

For the case of the year 1 form January to December, the exercise was performed for the entire planning horizon 5 years, getting the following table:

Table 6
Comparative Analysis

Year	*Period*	*Breakeven Indicator*	*Classic Method*	*Classic Average*	*Fuzzy Breakeven*
1	January	Sales Units	1,094,787.63	1,082,435.81	1,041,821.06
	December	Sales Units	1,070,083.99		
	January	Income	5,473,938.16	5,412,179.06	5,209,105.30
	December	Income	5,350,419.96		
	January	% C. A.	51.76%	47%	44%
	December	% C. A.	43.24%		
2	January	Sales Units	1,070,083.99	1,067,814.93	1,041,821.06
	December	Sales Units	1,065,545.86		
	January	Income	5,350,419.96	5,525,545.17	5,209,105.30
	December	Income	5,700,670.38		
	January	% C. A.	43.05%	39%	44%
	December	% C. A.	35.70%		

Year	*Period*	*Breakeven Indicator*	*Classic Method*	*Classic Average*	*Fuzzy Breakeven*
3	January	Sales Units	1,041,036.91	1,032,974.25	929,947.23
	December	Sales Units	1,024,911.60		
	January	Income	5,959,415.78	5,913,261.11	5,556,963.25
	December	Income	5,867,106.43		
	January	% C. A.	35.59%	33%	29%
	December	% C. A.	30.37%		
4	January	Sales Units	1,054,538.23	1,050,667.06	939,701.83
	December	Sales Units	1,046,795.90		
	January	Income	6,459,273.36	6,435,561.64	6,021,699.82
	December	Income	6,411,849.92		
	January	% C. A.	31.25%	30%	27%
	December	% C. A.	29.08%		
5	January	Sales Units	1,042,301.28	1,038,937.17	1,018,713.09
	December	Sales Units	1,035,573.06		
	January	Income	6,831,221.82	6,809,173.50	6,676,625.28
	December	Income	6,787,125.17		
	January	% C. A.	28.95%	28%	27%
	December	% C. A.	0.270738055		

Source: Self elaboration

As shown in the table above, working with the theory of uncertainty, gives us a broader spectrum for an effective decision-making process, this is noticed because at every one of the calculated years, the breakeven point in units as in sales happen to be minor than the results obtained in the classical methods. This result is positive for the present project. The percentage of the capacity utilized reflects that with less than 44% of production of the utilized capacity we can reach the breakeven point, this guarantees a wide margin of production towards utility.

Evaluation of investment projects

The modern financial theory advocates, among other things, for the efficient allocation of financial resources of the company in those assets that are necessary for carrying out the productive activity, this in order to contribute from a financial perspective, to achieve the overall long-term objective of the business.

As a previous requirement for the application of any criteria of investment project evaluation, it has to be determined the cash flow in the planning horizon of the project; it is highly recommended that the process is completed as mentioned by González S. (1985), as follows:

$FF_t = UN \text{ o } P_t + D_t + A_t + Vs_t - I_t$
Where:

FF_t	=	Cash Flow	t= 1,2,3,…n
$UN \text{ o } P_t$	=	Utility or Loss	t= 1,2,3,…n
D_t	=	Depreciation	t= 1,2,3,…n
A_t	=	Amortization	t= 1,2,3,…n
Vs_t	=	Rescue Value	t= 1,2,3,…n
I_t	=	Investments	t= 1,2,3,…n

Net Present Value Method

The Net Present Value is the actual value of all the expected yields over the investment (González S. 1985), in other words, it is the sum of all the flow of positive funds, the losses and investments brought to the present time in an investment project.

Initial Investment = $ 5, 984, 508.00
Cash Flow:
FF_1 = $ 1,723,384.42
FF_2 = 2,414,375.87
FF_3 = 3,384,697.18
FF_4 = 4,340,976.16
FF_5 = 5,079,896.78

Considering a trema = 20%

$$PNV = IT + \frac{\sum_{j=1}^{n} FFj}{(1+i)j} \qquad \text{PNV} = \$3{,}201{,}144.79$$

In order to calculate the Fuzzy NPV:

The mathematic formulation of the model is similar to the classic presentation, incorporating for this case of study, a presumption level of the flows derived from the project, and for this case, we have considered uncertainty, the formulas are:

$$\tilde{NPV} = -A + \sum_{j=1}^{n} FF_j(\alpha) \prod_{s=1}^{j} (1 + i_s(\alpha))^{-1}$$

$$\tilde{NPV}(\alpha) = -A + \sum_{j=1}^{n} FF_j(\alpha) \prod_{s=1}^{j} \left[\frac{1}{[1+s_s(\alpha)]}, \frac{1}{[1+r_s(\alpha)]} \right]$$

$$\tilde{NPV}(\alpha) = -A + \sum_{j=1}^{n} [gj(\alpha), lj(\alpha)] \prod_{s=1}^{j} \left[\frac{1}{[1+s_s(\alpha)]}, \frac{1}{[1+r_s(\alpha)]} \right] \qquad \forall \alpha \in [0,1]$$

This equation allows us to obtain, for each level, the wide range of possibilities between which it is expected the value to be in the reality. From the obtained result, one can deduce the possibility of situating it in the reality, and in consequence, the result may be over or under the expected value.

For the financial evaluation of the project, we can apply the formulas stated above as:

Table 7
Cashflow of the project

Año	*Flujo de fondos*		
0	- 5,984,508.00		
1	1,723,384.42	1,999,781.15	2,276,177.88
2	2,414,375.87	2,784,056.49	3,153,737.11
3	3,348,697.18	3,746,232.35	4,143,767.52
4	4,340,976.16	4,556,203.24	4,771,430.32
5	5,079,896.78	5,309,874.40	5,539,852.02

Source: Self elaboration

Table 8
Interest Rate

Tipo de interés		
0.15	0.18	0.20
0.20	0.21	0.23
0.24	0.25	0.26
0.26	0.27	0.28
0.31	0.32	0.33

Source: Self elaboration

We evaluate the project using the NPV, it is of interest knowing it behavior level by level, with an $\alpha = 0.0,0.1,0.2,0.3,.....0.9,1.0$.

Solving the system for the different levels of $\alpha = 0.0,0.1,0.2,0.3,.....$ 0.9,1.0, we obtain the different confidence levels for the NPV, these levels are related to its different presumption levels:

Table 9
Confidence levels for the NPV

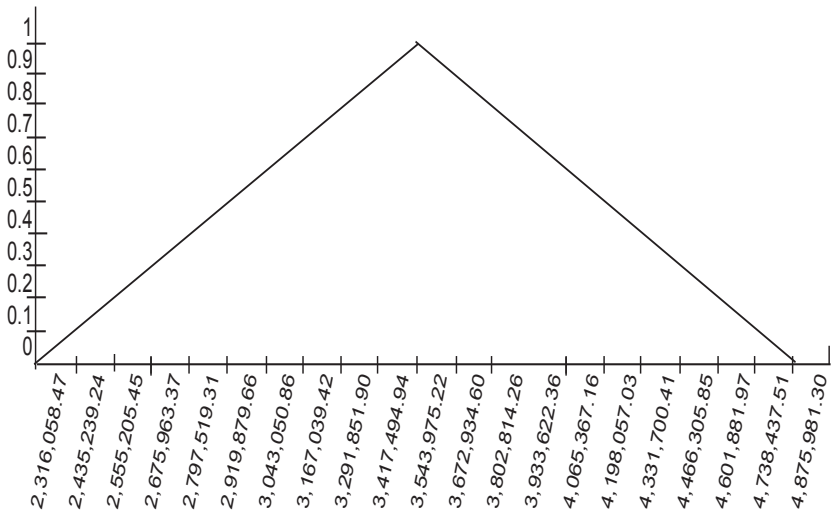
α	*NPV* (α) *(u.m)*
0	(2,316,058.47, 4,875,981.30)
0.1	(2,435,239.24, 4,738,437.51)
0.2	(2,555,205.45, 4,601,881.97)
0.3	(2,675,963.37, 4,466,305.85)
0.4	(2,797,519.31, 4,331,700.41)
0.5	(2,919,879.66, 4,198,057.03)
0.6	(3,043,050.86, 4,065,367.16)
0.7	(3,167,039.42, 3,933,622.36)
0.8	(3,291,851.90, 3,802,814.26)
0.9	(3,417,494.94, 3,672,934.60)
1	(3,543,975.22, 3,543,975.22)

Source: Self elaboration

Using the information in the table shown above, it allows us to make a better an more efficient decision making process, whether invest or not, the present investment project, as it is shown in the most different levels of presumption of the NPV, happen to be positive, this indicates us the benefits of the project, and from this perspective the viability of it.

Graphically the results are:

Fig. 1
Triangular Fuzzy Number



Source: Self elaboration

As we can observe, the figure is a graphical representation of a Fuzzy Triangular Number. In the graphic we can notice that as the level of presumption lowers, the representation of the NPV fits progressively, this fulfills the property of convexity of the NBT.

As a result:

$$\text{NPV} = [2{,}326{,}058.47,\ 3{,}543{,}957{,}934.26\ ,\ 4{,}875{,}981.30]$$

Results

Calculating the breakeven point with the theory of uncertainty allows us to visualize an interval, called threshold of profitability, which allows the enterprise to control its operative costs, proportionating efficiency to the process, therefore achieving greater utilities.

Once the breakeven point is calculated under the theory of uncertainty, it is observed a diminution of the value calculated with the classic theory, this happens because the operation costs in the calculation are considered optimal.

We can notice that the (%) CA as the breakeven point decreases, the production capacity of the enterprise gets optimal.

It is observed that calculating the NPV by the classic theory, the project has high profitability.

As we make the calculation of the NPV under the theory of uncertainty, we notice a triplet confidence, describing the profitability of the project, thus proportionating the investor a wider spectrum of decision.

References

Baca, U. G. (2002). *Evolución de proyectos.* México: McGraw Hill.

Gil Lafuente J.(1997). *Marketing para el nuevo milenio.* México: Pirámide

Gil Lafuente A.M. (1993). *El análisis financiero en la incertidumbre. Ed. Ariel*

González, S. F. (2000).*La incertidumbre en la evaluación financiera de las empresas. FEGOSA Ingeniería Administrativa*

González S. F. (2002). *Técnicas de análisis empresariales en la certeza e incertidumbre.* FEGOSA

González S. F. (2003). *Diseño de empresas de orden mundial.* México: UMSNH-URV.

Terceño G. A. (1997). *La decisión de la inversión en la incertidumbre. FCEE-URV.*

The key factors
to develop competitiveness
se terminó de imprimir en julio de 2013
en los talleres de Ediciones de la Noche
Madero #687, col. Centro
Guadalajara, Jalisco.
El tiraje fue de 500 ejemplares.

www.edicionesdelanoche.com