ESTUDIO DEL IMPACTO DE LAS TECNOLOGÍAS DE LA INFORMACIÓN Y EL ESTILO DE APRENDIZAJE EN LA PRODUCTIVIDAD DE LAS COMPAÑÍAS CONSULTORAS

STUDY OF THE IMPACT OF INFORMATION TECHNOLOGIES AND LEARNING STYLE ON THE PRODUCTIVITY OF CONSULTANT COMPANIES

DANNY XAVIER ARÉVALO AVECILLAS[1],CARMEN PAOLA PADILLA LOZANO[2], MANUEL REINALDO MATUTE FERNÁNDEZ[3], JOSÉ ROBERTO MORALES VERGARA[4]

1 Universidad Católica de Santiago de Guayaquil, Ecuador. *danny.arevalo@cu.ucsg.edu.ec*
2 Universidad Católica de Santiago de Guayaquil, Ecuador. *carmen.padilla@cu.ucsg.edu.ec*
3 Universidad Católica de Santiago de Guayaquil, Ecuador. *manuel_matute1609@hotmail.com*
4 Universidad de Guayaquil, Ecuador. *roberto.moralesv@ug.edu.ec*

RESUMEN

El presente artículo pretende estudiar el impacto de la Sistematización e Informatización de procesos en la Productividad de Empresas de Servicios en consultoría en el mercado ecuatoriano, mediante el desarrollo de un modelo econométrico de regresión lineal multivariado que analiza la influencia de las tres variables exógenas: Implementación de Tecnologías de Información (TI), Nivel de Capacitación y Estilo de aprendizaje, con relación a la variable endógena Productividad. La investigación es de tipo no experimental, de corte transversal y de lógica deductiva, y el estudio de campo se efectuó en 178 consultoras de las ciudades de Quito y Guayaquil, considerando que en estas ciudades concentran mayor actividad empresarial. Se escogieron los siguientes estratos para el procedimiento muestral: (a) Consultoras dedicadas a la Investigación Científica y Desarrollo, (b) Consultorías de Gestión Empresarial y (c) Consultorías de Investigación de Mercado y Publicidad. El modelo econométrico presentó un R^2 ajustado de 67,01%, indicando robustez en la investigación, y adicionalmente se determinó que las TICs tienen mayor incidencia en la productividad de las consultoras.

PALABRAS CLAVE: tecnologías de información, capacitación, estilo de aprendizaje, productividad, consultoría.

ABSTRACT

This article aims to study the impact of the production processes in Ecuadorian firms, by developing a multivariate linear regression model that analyzes the influence of the three exogenous variables. Implementation of Information Technology (IT), level of training and learning style, regarding the endogenous variable "productivity". The research is non-experimental, cross-sectional and deductive logic, and the study was carried out in 178 firms in the cities of Quito and Guayaquil, where most of the business activity is concentrated. The following stratums were chosen for the sampling procedure: (a) Consultants engaged in scientific research and development, (b) Business Management Consulting, and (c) Market Research Consulting and Advertising. The model presented an adjusted R^2 of 67.01%, indicating robustness in research, and additionally it was found that IT has a greater impact on the productivity of consulting firms.

KEYWORDS:information technologies, level of training, learning style, productivity, consulting.

DOI: http://dx.doi.org/10.23878/alternativas.v18i2.124
RECIBIDO: 7/1/2017
ACEPTADO: 30/5/2017

INTRODUCTION

The natural evolution of markets, based on one hand on new corporate or business needs, and on the other hand on the development of skills and professional skills, have established new markets and needs, so the range of services demanded by companies is much more (A) Legal Activities, (b) Architecture and Engineering, (c) Scientific Research and Development, (d) Business Management Consultancies, (e) Market Research and Advertising Consultancy, among others. The following research is based on the study of these last three activities and what is sought is to determine the efficiency of the use of information technologies.

The quality of services received by corporations and the time taken for delivery, can be decisive, both as a differentiating element of the operations of the company, and as in the level of improvement of the results of the exercise.

According to the Central Bank of Ecuador (ECB, 2015), it is important to consider that the greatest sectoral aggregation that can be observed in an economy responds to the degree of development and transformation of products. In this sense, primary and / or extractive activities can be recognized, including agriculture, livestock, hunting, forestry, aquaculture, fishing and mining, which together stand for 10.4% of Ecuador's non-oil GDP. In the same classification, the secondary sector is later identified, which is responsible for the transformation and / or aggregation of value to primary and other semi-processed products, overall this is basically the manufacturing industry.

Finally, the tertiary sector of the economy is featured, where all service activities, including trade and construction, are located. On these two sectors it is necessary to make an additional consideration, since those, in terms of the intersectorial relations in a productive context, can function both as a support for other economic activities as well as for independent economic activities, which is why it is convenient to assess their Contribution to the economy separately. By excluding trade and construction activities, it is obtained that during 2014 the tertiary sector of the economy, ie services activities, accounted for 51.9% of non-oil GDP. See Figure 1.

The changes in manufacturing, trade and construction markets during 2014 contributed together 37.7% of Ecuador's non-oil GDP, which does not differ significantly from the average level of 37.3% observed for the period 2004-2014 (ECB, 2015). By contrast, service activities recorded a 1.1 percentage point increase in its share of the non-oil economy, an increase that was consolidated in 2009, the year of the international financial crisis and low oil prices, which led to a minimal growth of the Ecuadorian economy (0.6%). See figure 2 and 3.

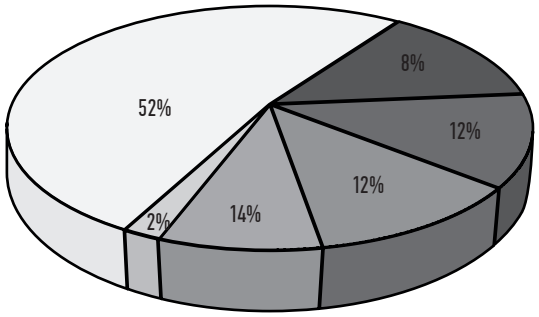

Figure 1. Main non-oil economic markets in 2014
*Includes agriculture, livestock, hunting and forestry
**Participation was measured in real figures
Source: Banco Central del Ecuador
Developed by: Authors

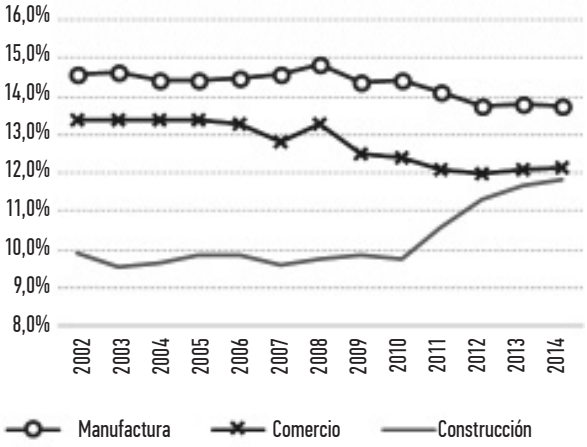

Figure 2. Ecuador: PIB Sectorial (participación)
Source: Banco Central del Ecuador
Developed by: Authors

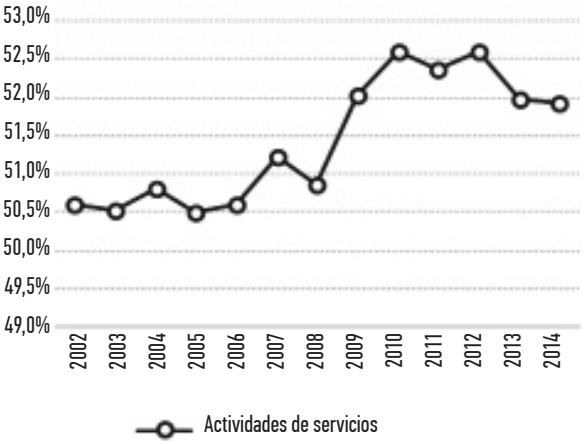

Figure 3. Ecuador: PIB Actividades de servicios (participación)
SoVVVV Authors

It is important to establish the relationship between the different economic sectors regarding the performance of the economy as a whole, especially in relation to service activities, because they stand as service providers that support the activity of other economic activities. Although the change described above about the role of the tertiary sector can be perceived at a minimum (1,1 percentage points between 2004 and 2014), this should not be seen as a sign of a standstill in the dynamism of the service sectors; instead, it should be considered as a sign of the stable economic structure under which Ecuador's economic activity has developed over the last few years.

It is worth pointing out that the participation of the service industry in the non-oil economy may differ between their actual (base year prices) and nominal (current prices) measurements, basically due to the price dynamics faced by other sectors of the economy, However, since the share in real terms exceeds the nominal measurement, the importance of these sectors for the Ecuadorian economy is reaffirmed.

THEORETICAL FRAMEWORK

The present study aims to study the tripartite relationship between service companies (specifically Business Management, Marketing Research and Advertising consultancies), the companies that demand these services, and the contribution to economic growth in Ecuador.

Given Ecuador's case, there are no studies that allow a previous view of the subject of study, and yet the present work has taken as a starting point the experiences of Yrivarren (2010). In his qualitative research on the perceived success in information technology consulting within the Peruvian territory, he emphasizes the business perception that the incorporation of information technologies (IT) is associated to an improvement of the productivity of the company.

The basic framework for arguing the relationship between IT investment and productivity comes from authors such as Kraemer and Dedrick (1994), who identified a positive correlation of IT with productivity. On the other hand, Dewan and Kraemer (2000) found a positive correlation in IT investment with labor productivity in developed countries.

Kraemer and Dedrick (2001) conducted a study in 43 countries and identified the correlation in the increase in IT investment and the increase in productivity. Also, Melville (2001), who conducted a study in 31 countries between 1965 and 1991, concluded that the economic benefit of IT increases over time

Going further, Plice (2001) studied six sectors in 38 countries and showed that IT investment shows a return on investment between 5 and 8 times higher than companies that do not invest in information technologies in developed countries. It is important to point out that Hitt and Brynjolfsson (1996) found that firms that implement information technologies and decentralize organizations, are 5% more productive than centralized organizations.

The relationship between IT and the business environment is dynamic, therefore it has not been possible to identify a relationship as such (Dewan & Kraemer, 1998). However, as López Sánchez mentions in his article "Can Information Technologies Improve Productivity?" over the last few years we have seen the expansion of studies aimed to analyze the economic impact of IT development (Sánchez, 2004).

Although there are theories, mainly associated with the productivity paradox of Robert Solow (winner of the Nobel Prize in Economics for his studies on economic growth), that establish IT investment may not be justified if the return of said investment is evaluated.

Kraemer and Dedrick (2001) explain why this paradox of productivity could exist, and indicate that it is basically because firms do not adequately train their employees and because they do not integrate IT into the value chain of companies.

Hitt and Brynjolfsson (1996) have attributed to IT large improvements in productivity and substantial consumer benefits. In fact, they showed a small link between computer investment and productivity using data from technology investment in manufacturing industries; Improvement in productivity thrives in organizational culture when managers and employees feel supported by taking risks to achieve organizational goals. While others report that IT has had no impact on business profits; and as it turns out to be, the increase of productivity depends as much on the technological innovation as on the organizational changes made in the firm.

Despite the different theories attached to the study of IT and its impact on business activity, it is imperative to quantify the impact of IT investment on the company's ability to generate value.

The following variables were identified in the study, presented in different order: (a) informa-

tion technologies, (b) organizational learning style, (c) training level, and (d) productivity, the aforementioned being the endogenous variable of the model.

INFORMATION TECHNOLOGY

Cobo (2009) defines IT as "innovations in computing (hardware and software), telecommunications, microelectronics and optoelectronics that allow the processing and accumulation of enormous amounts of information, as well as a rapid distribution of information through communication networks "(p.298).

There are several types of research that support the importance of IT in business environments. Organizations nowadays require the necessary technological infrastructures to promote their sustained growth, through the optimization of access and the application of knowledge as a source of competitive advantages (Alves de Almeida, 2005).

The use of information technologies within organizations presents different roles, depending on their orientation. As indicated by Hoyos and Valencia (2012) IT is classified in the business field in three different approaches: (a) information oriented, ie technologies for data storage and processing, in order to distribute and provide information to the different processes of the organization; (b) communication oriented, i.e. aimed at reducing communication costs and easy access to the transmission of information between different areas of a company; and (c) workflow oriented, which allows the integration of different business capabilities for results and automatization of processes.

The World Economic Forum (2014) recognizes that 10% of broadband penetration generates an increase of 0.25% of GDP, and countries with greater IT penetration experience a productivity seven times higher than countries that do not use IT intensively. Pérez (2005) established an offer and demand relationship between systems and information technology. In this relation, he considers that the origin of both would be in the business strategy that defines the information needs and its progressive implementation. As such, these technologies interact with the strategy, expanding the definition of new needs. Under this definition, it is possible to indicate that IT represents the set of technical tools offered by the IT and telecommunications market to organizations that seek the implementation or redesign of their information systems.

TRAINING LEVEL

According to Siliceo (2006), organizations must lay the foundations on which their workers have the necessary, specialized training and can cope in the best conditions of their daily tasks, i.e., there is no better alternative than training to reach high levels of motivation, productivity, integration, commitment and solidarity in the workers of the company. According to this author, there are eight important purposes of training: (a) to create, disseminate, reinforce, maintain and update the culture and values of the organization; (B) clarify, support and consolidate organizational changes; (C) raising the quality of performance (d) solving problems and improving effectiveness; (E) enable a promotion; (F) induce and guide the new staff in the company; (G) updating knowledge and attitudes; And (h) fully prepare for retirement. For this to happen, several authors recommend that organizations must apply training needs analysis techniques, in order to determine failures and improve performance. Cerna (2014) mentions that the benefits of training needs analysis are three: (a) to increase the effectiveness of training by providing an objective measurement of the effectiveness of current training and to improve both short and long term training; (b) to improve individual performance; and (c) to contribute to the achievement of organizational goals, ie training modules customized to specific business topics.

LEARNING STYLE OF THE ORGANIZATION

As Enríquez (2007) mentioned, organizational learning can be conceived from two perspectives: as a technical process or as a social process. This learning as a technical process is characterized by the efficient processing and interpretation of the information, both qualitative and quantitative, that is presented inside and outside the organization. This involves the introduction of information systems to support collection and storage of data. On the other hand, learning as a social process focuses on the way people attribute meaning to their work experiences. This becomes a complement to the technical perspective, since it is understandable that the data has no meaning by itself, since it is people who represent and give value to them (Enríquez, 2007).

Due to the extensive literature on organizational learning, several attempts have been made to operationalize this variable through quantitative techniques. Cobo and Romaní

(2009) affirm that in the last decade an increasing interest in the academic field has been experienced in the development of a scale of measurement that allows valuing organizational learning as a latent multidimensional variable. In this way it would be necessary for the organization to present a high degree in each and every one of these dimensions to affirm that there is effective organizational learning.

A clear example is the study by Castañeda and Fernández (2007) on the validation of a scale of levels and conditions of organizational learning. These describe organizational learning as a process of acquisition and transfer of knowledge that occurs at three levels: (a) individual, (b) groupal, and (c) organizational. In turn, it requires at least three conditions to occur: (a) a culture that facilitates learning, (b) a training process, both technical and institutional, and (c) the transfer of information that become knowledge (Brynjolfsson & Hitt, 2003).

PRODUCTIVITY

According to Hwang, Kim and Lee (2015), the appropriate use of IT provides a competitive advantage to firms in an increasingly dynamic environment. What is relevant is that IT has a significant impact on the productivity of companies as long as IT is aligned with organizational strategies and decisions are taken in a decentralized standpoint. Most organizations consider their performance in terms of meeting goals, associated with their mission and objectives.

It is important to note that Brynjolfsson and Hitt (1998) indicated that the investment in computers, software and IT management personnel has a very important influence on the productivity of firms, and they also mention that the endogenous variable productivity is measured with the total turnover of the firms.

Martinez (2010), in his study using the Denison model, measures productivity through the following variables: (a) sales growth, (b) market share, (c) profitability and return on assets, (D) quality of products and services, (e) development of new products and services, (f) employee satisfaction, (g) overall company performance, and (h) innovation rating.

METHODOLOGY (MATERIALS AND METHODS)

This research is non-experimental, cross-sectional and deductive logic. The sector analysis characteristic of this research demands, as such, the analysis of statistics at the macroeconomic level. For this analysis we used information provided by official entities such as the Central Bank of Ecuador, the National Institute of Statistics and Censuses and the Internal Revenue Service. The survey was designed considering a quantitative approach that allows us to generate an econometric model.

The study population corresponds to companies in the market research services industries located in the cities of Guayaquil and Quito, considering that in these two cities most of the business are run, and that includes the main consultants linked to the field of business consulting.

According to information provided by the Superintendence of Companies, there are currently in Ecuador an estimated 3,404 companies that provide professional, scientific and technical services, of which 18.63% (634) are engaged in activities related to Business Management consultancies; And 18.21% (620) is engaged in advertising and market research, specifically 15.75% (536) of advertising, 2.47% (84) of market research and 44.94% to other types of consultancy such as consultancy related to the legal and the construction fields.

We worked with disproportionate stratified random sampling, which, by definition, is applied to address difficulties with stratified samples of unequal sizes, ie the sampling fraction varies in each stratum. All in all, a sample of 178 consultancies was selected, according to the table below.

TABLE 1. SAMPLE OF CONSULTING FIRMS CONSIDERED IN THE STUDY

SEGMENTS	POPULATION	SAMPLE FRACTION	SAMPLE	GUAYAQUIL	QUITO
Market research	43	80,0%	34	13	21
Advertising	468	20,0%	94	41	53
IT	124	40,0%	50	7	43
Total	635		178		

Source: Banco Central del Ecuador

Developed by: Authors

The research questions will focus on defining, in quantitative terms, the structure of the companies to be studied, assessing volume of activity, income generation, costs, and levels of investment in information technologies. The research questions will mainly focus on the variables to be analyzed in the present study, such as the level of learning of the people who enter the consultants and the training of the staff.

Among the variables that will be used in the proposed model, according to the literature, employee training, learning style, and innova-

port, such as the SPSS software for tabulation of quantitative data.

RESULTS

Of the total of the consulting companies surveyed, 34.3% are in the city of Guayaquil, and the remaining 65.7% in the country's capital. Regarding the operation time of the consultants, the data show that the majority of studied companies (46.6%) have between 4 and 6 years of market presence, followed by 21.3% of companies that have an experience in the range of 10 and 13 years; 19.7% have approximately a decade and only 11.2% of the consultants surveyed have more than 14 years in the market.

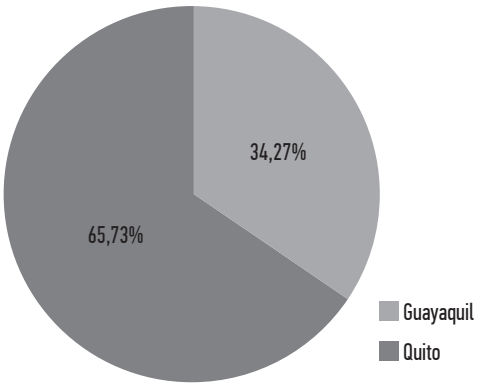

Figure 4. Consulting companies' allocation
Source: Banco Central del Ecuador
Developed by: Authors

The tables below show the descriptive statistics about each variable considered and their respective items.

TABLE 3. DESCRIPTIVE STATISTICS OF THE ATTRIBUTE "TECHNOLOGICAL INFRASTRUCTURE"

TECHNOLOGICAL INFRASTRUCTURE	YES	NO
E-mail	**100%**	0%
Web Site	83,70%	16,30%
Buys/Sells using Internet	56,70%	43,30%
Uses electronic banking	77,50%	22,50%
Uses marketing through internet	50,60%	49,40%
Has corporate intranet	41,60%	58,40%
Uses social networks (Comunnity Management)	**38,20%**	61,80%
Processes taxes through internet	48,90%	51,10%

Source: Banco Central del Ecuador
Developed by: Authors

Table 3 shows the percentage of consultants who answered yes and no to each item, referring to the technological infrastructure that each one has. It is highlighted that 100% of the consultants use electronic mail, and 83.7% have a website. By contrast, the lowest percentage corresponds to the use of social networks or community management, which is a serious error since many firms carry out their advertising campaigns in social networks.

The items in the attribute "IT functionality" have been operationalized with a five-point Likert scale, and it is evident that most consultants consider that IT is used to generate innovation and new information technology capabilities. The item with the lowest average reveals that consultants consider that the implemented technologies contribute to a lesser extent to the development of improvements in the availability of services (Internet)

TABLE 4. DESCRIPTIVE STATISTICS OF THE ATTRIBUTE "IT FUNCTIONALITY"

THE IT ARE USED IN BUSINESS INDUSTRIES TO:	MEAN	STD DEV.	MIN.	MAX.	RANGE
Generate more R&D that lead firms to become more productive.	4,44	0,64	3	5	2
Evaluate changes in the preferences of our clients and adjust the organization to the needs of the market	4,21	0,69	3	5	2
Innovations in services: Develop new knowledge as a basis for the development of new services	4,61	0,69	2	5	3
Integrate our current knowledge with new knowledge and information	4,13	0,75	3	5	2
Innovations in processes: Use information and knowledge in activities important to the company	4,56	0,67	2	5	3
Organizational innovations: Assign tasks according to staff experience or knowledge	4,13	0,66	3	5	2
Obtain continuous improvements of the internal processes of the company to generate better	4,31	0,67	3	5	2
Contribute to the reduction of operating costs	4,29	0,67	3	5	2
Contribute to the reduction of service costs	4,21	0,70	3	5	2
Improve the productivity of workers and customers	4,24	**0,74**	3	5	2
Contribute to compliance of internal rules, regulations and regulations of the firm	4,19	0,73	3	5	2
Develop improvements in the spatial availability of services (internet)	**4,11**	0,72	3	5	2
Generating innovation and new IT capabilities	**4,66**	**0,61**	2	5	3

Source: Banco Central del Ecuador
Developed by: Authors

Regarding the "training" variable, Table 5 shows that most consultants consider that

TABLE 5. DESCRIPTIVE STATISTICS OF THE ATRRIBUTE "TRAINING"

QUESTION	MEAN	STD DEV.	MIN.	MAX.	RANGE
How beneficial do you rate the reaction of your people regarding last year's training?	3,44	0,96	1	5	4
To what extent do you consider that there has been a transfer of knowledge to your employees through training?	**3,69**	0,85	1	5	4
At what level do you consider the training impacted on the employee performance?	3,47	1,07	1	5	4
Do you use any methodology to identify training needs in your company?	3,36	**1,20**	1	5	4

Source: Banco Central del Ecuador
Developed by: Authors

there has almost always been a transfer of knowledge to employees through training, while some methodology to identify training needs in these firms is used occasionally.

The variable "Learning Style" is broken down in 27 items. Table 6 shows that the consultants believe that when a new worker joins in, he always receives the respective induction on the entity to which he / she enters. The scenario is different with respect to the type of training that workers receive. Most consultants stated that these trainings are not always applicable to their work environment.

Table 7 shows the results of the survey for the endogenous variable "productivity". The consultants responded that to a larger figure, these firms are always looking to adapt to changes in the market, and have more satisfied and motivated employees. On the contrary, they state that from time to time these firms present less labor absenteeism.

TABLA 7. DESCRIPTIVE STATISTICS TO THE ATTRIBUTE "PRODUCTIVITY"

QUESTION	MEAN	STD DEV.	MIN.	MAX.	RANGE
Offers better qualitty services?	4,03	0,49	3	5	2
Has more efficient internal processes?	4,00	0,68	2	5	3
Has more satisfied costumers?	4,02	0,65	3	5	2
Is adaptable to market changes?	**4,10**	0,66	2	5	3
Is growing more?	3,99	0,82	2	5	3
Is more feasible?	4,00	0,61	3	5	2
Has more satisfied and motivated employees?	**4,10**	0,63	2	5	3
Has less absenteeism?	3,70	**0,96**	2	5	3

Source: Banco Central del Ecuador
Developed by: Authors

TABLE 6. DESCRIPTIVE STATISTICS TO THE ATTRIBUTE "LEARNING STYLE"

QUESTION	MEAN	STD DEV.	MIN.	MAX.	RANGE
Do people in the organization learn by observing their co-workers?	4,11	0,98	2	5	3
In this organization people produce knowledge by testing and testing	3,81	1,01	2	5	3
People in the organization learn when working in groups	3,67	1,01	2	5	3
People in the organization learn when they work in a group with enthusiasm	3,41	0,86	2	5	3
The people of the organization exchange knowledge freely when working in groups	3,15	0,88	2	5	3
The people of the organization achieve shared learning when working in	3,42	1,04	2	5	3
The organization's knowledge is applied by its members	3,70	1,13	2	5	3
The entity responds in the required time to the pressure of changing the learning environment	3,29	0,92	2	5	3
The entity improves its processes based on the knowledge of the people who work in it	3,75	1,10	2	5	3
The entity generates new products or services based on the knowledge of the people who work in it	3,67	1,18	2	5	3
People learn from the documents available in the entity	3,29	1,02	1	5	4
In this organization workers learn from the guidelines they receive from their bosses or superiors	3,38	0,86	2	5	3
In the entity, people who make mistakes by proposing to innovate are encouraged to continue working	3,45	0,83	2	5	3
Managers say that workers' learning contributes to the attainment of work objectives	4,02	0,94	2	5	3
The entity promotes situations for people to exchange their knowledge	3,11	0,87	2	5	3
The entity grants recognition to people who produce knowledge	3,54	1,10	2	5	3
Managers provide their working groups with information on meetings and events they attend	3,22	0,89	2	5	3
The entity trains its workers	3,09	**1,30**	1	5	4
The training that workers receive from the entity is applicable to work	2,97	1,12	1	5	4
The organization updates employees about any changes on it	3,70	0,92	2	5	3
When a worker joins the organization he receives induction on the entity he enters	**4,35**	0,67	2	5	3

Source: Banco Central del Ecuador
Developed by: Authors

Table 8 shows the different correlations between the variables considered for the model, ie, the strength of the linear relationship between the variables. Those values with an asterisk indicate a statistical significance at a 95% confidence level, according to their p-value used for this type of studies. The following pairs of variables have p-values below 0.05: (a) IT infrastructure and IT functionality, (b) IT functionality and training, (c) IT and learning style, (d) IT functionality and productivity, (e) training and learning style, (f) training and productivity, and (g) learning style and productivity.

TABLE 8. VARIABLE CORRELATION MATRIX

		X_1	X_2	X_3	X_4	Y_1
X_1	Technological Infraestructure	1				
X_2	IT Functionality	**0,2148 ***	1			
X_3	Training	-0,0004	**0,1552 ***	1		
X_4	Learning Style	0,0624	0,4570 *	**0,4805 ***	1	
Y_1	Productivity	0,1284	0,7560 *	**0,3463 ***	**0,6082 ***	1

Source: Banco Central del Ecuador
Developed by: Authors

Thus, three alternative hypotheses of importance for the present study are accepted: (a) H1: Information technologies have a positive influence on the productivity of consultancies; (b) H2: Training positively influences the productivity of consultancies; and (c) H3: the level of learning positively influences the productivity of consultancies.

The econometric model was developed with three independent variables that determine the level of productivity of the consultants: (a) IT functionality, (b) training, and (c) learning style. According to Table 9, the equation representing the multiple linear regression model to describe the relationship between productivity and the three independent variables is as follows:

$$Productivity = 26{,}7454 + 0{,}3234 * (IT\ Functionality) + 0{,}1160 * (training) + 0{,}0543 * (learning\ style)$$

In the Anova analysis, the p-value is less than 0.05 and indicates that there is a statistically significant relationship between the variables with a 95% confidence level. It also determines that, this significance is justified according to the Determination Coefficient, with 67.01%.

The adjusted R2 statistic, which is more appropriate to compare models with different number of independent variables, indicates a value of 66.23%, meaning that the independent variables explain the variability of productivity in the consultants in this percentage.

The highest P-value of the independent variables is 0.0200, which corresponds to the "training" variable, and since the P-value is less than 0.05, this term is statistically significant with a confidence level of 95,0%.

Consequently, the model is not subject to simplification.

TABLE 9. ECONOMETRIC MODEL OF THE IT AND ITS IMPACT IN PRODUCTIVITY

PARAMETER	COEFFICIENT	STD. ERROR	T- VALUE	P-VALUE
Constant	26,75	1,406	19,02	0,00
IT Functionality	0,32	0,027	12,03	0,00
Training	0,12	0,049	2,35	0,02
Learning Style	0,05	0,012	4,68	0,00
R^2 = 67,01%			**F = 108,99 ***	
Adjusted R^2 = 66,39%			**gl = 164**	

* Statistically significative at a 5% level
Source: Banco Central del Ecuador
Developed by: Authors

The model suggests a greater weight for variables such as IT functionality, meaning that the consultants achieve a higher degree of productivity derived from better quality services, customer satisfaction, higher sales growth and profitability, by generating and implementing strategies based on Information technologies focused on innovation in services, process innovation, organizational innovations, improvements in worker productivity and achieving efficiency through cost minimization. Likewise, the model considers the variable training as a means to sustain the degree of productivity of the consultants.

The efficiency in the level of training is derived in the degree to which workers react favorably to them, when there has been a favorable transfer of the knowledge and that the training has had a favorable impact on the skills of employees.

CONCLUSIONS

According to the research findings, it is possible to determine that a consultant is more productive to the extent that it guarantees efficiency in the use and intensity of IT, and justified in an adequate investment in them. On the contrary, a consultant is not more productive

because she invests in training, but rather because it guarantees that the training received is adequate for the training and performance of the personnel, according to the first regression model.

It is important to mention that IT is a representative support for the improvement of business efficiency that later translates into productivity. It is followed by the training in order of incidence, according to the model, leaving the last place to the style of learning. Thus, the production of consulting services is based on the optimization of IT that somehow generates added value in the offered products.

Finally, the regression model gives a considerable weight to the variable "investment in learning activities", which indicates that a consultant generates more income as it generates activities that promote learning in several directions, either from the organization to the employee, between employees, and from the employee to the organization.

RECOMMENDATIONS

It is important to segment and compare the results of this study so that data can be generated for each city of the country, in other words, to identify other strategic sectors of Ecuador in which the study can be replicated.

A clear example is Galapagos, given that it demands services for environmental impact, in its case the perspective and analysis changes, but not far from the general concept.

Likewise, the information obtained about the weights that the exogenous variables have for the endogenous variable, given that the cities studied are the main ones of the country, are attached to an area where IT shows a peak. It is contrasted should there be a study in a completely agricultural area. It should be noted that the studied companies have a national scope of action and can generate products for all types of demand.

Nevertheless, new variables can be incorporated into the model, such as Knowledge Management, which is measured through R&D.

In the long term, the information obtained is very useful for the improvement of service companies and companies in other sectors, such as Manufacturing, but it is important to conduct more research in different sectors in order to be able to contrast the results and to draw more general conclusions.

REFERENCIAS BIBLIOGRÁFICAS

Alves de Almeida, M. d. (2005). *La Dirección de los Recursos Humanos y Las Nuevas Tecnologías de la Información y la Comunicación.* Sevilla: Tesis Doctoral. Universidad de Sevilla.

Banco Central del Ecuador. (2015). *Boletín Estadístico.* Quito: Banco Central del Ecuador.

Berman, E. M., & West, J. P. (1998). Productivity Enhancement Efforts in Public and Nonprofit Organisations. *Public Productivity & Management Review*, 207-219.

Brynjofsson, E., & Hitt, L. M. (2003). Computing productivity: Firm-level evidence. *The Review of Economics and Statistics, 4*(85), 793-808.

Brynjolfsson, E. (1993). The productivity paradox of information technology. *Communications of the ACM, 36*(12), 66-77.

Brynjolfsson, E., & Hitt, L. (1998). Beyond the Productivity Paradox: Computers are the Catalyst for Bigger Changes. *Forthcoming in the Communication of the ACM*, 1-19.

Castañeda, D. I., & Fernández Ríos, M. (2007). Validación de una escala de niveles y condiciones de aprendizaje organizacional. *Universitas Psychologica*, 245-254.

Cerna Muñoz, L. G. (2014). *Análisis Comparativo del Nivel de Capacitación en Chile y el Resto del Mundo - países desarrollados.*

Cobo Romaní, J. C. (2009). El Concepto de Tecnologías de la Información. Benchmarking sobre las definiciones de las TIC en la Sociedad del Conocimiento. *Revista de Estudios de Comunnicación - ZER*, 295 - 318.

Dewan, S., & Kraemer, K. (1998). International dimension of the productivity paradox. *Communications of the ACM*, 56-62.

Dewan, S., & Kraemer, K. (2000). Information technology and productivity: evidence from country level data. *Management Science, 46*(4).

Enríquez, Á. (2007). La significación en la cultura: Concepto base para el aprendizaje organizacional. *Universitas Psychologica*, 155-162.

Hitt, L., & Brynjolfsson, E. (1996). Productivity, business profitability and consumer surplus: Three different measures of information technology value. *MIS Quarterly*, 121-142.

Hoyos Chaverra, J. A., & Valencia Arias, A. (2012). El Papel de las TIC en el Entorno Organizacional de las PYMES. *Trilogía*, 105-122.

Hwang, J.-S., kim, S., & Lee, H. (2015). Breaking the Myths of the IT Productivity Paradox. *KSII Transactions on internet and Information Systems, 9*(1), 466-482.

Kraemer, K. L., & Dedrick, J. (2001). Information technology and productivity: results and policy implications of cross-country studies. En *Information Technology, Productivity and Economic Growth: Implications for Economic Development.* Pohjola: Oxford University Press.

Kraemer, K., & Dedrick, J. (1994). Payoffs from investment in information technology: lessons from the Asia-Pacific region. *World Development, 22*(12), 1921-1931.

Malhotra, N. (2008). *Investigación de Mercados* (Quinta Edición ed.). México: Pearson Education.

Martínez, M. E. (2010). Relaciones entre cultura y desempeño organizacional en una muestra de empresas colombianas: Reflexiones sobre la utilización del modelo de Denison. *Cuadernos de Administración, 23*(40), 163-190.

Melville, N. (2001). Impact of IT investment: And industry analysis. *Irvine: Unpublished manuscript, Centre for Research on Information Technology and Organization, University of California*.

Pérez, D. (2005). *Contribución de las Tecnologías de la Información a la Generación de Valor en las Organizaciones: Un Modelo de Análisis y Valoración desde la Getión del Conocimiento, la Productiividad y la Excelencia en la Gestión.* Santander: Tesis Doctoral. Universidad de Cantabria.

Plice, R. (2001). *A contribution to the empirics of IT returns.* Center for Research on Information Technology and Organizations.

Sánchez, J. I. (2004). ¿ Pueden las tecnologías de la información mejorar la productividad? *Universia Business Review, 1*(1).

Siliceo, A. (2006). *Capacitación y Desarrollo del Personal.* México D.F.: Editorial Limusa.

World Economic Forum. (2014). *Networked Readliness Index Raking 2014.* Recuperado el 2015, de The Global Information Technology Report 2014: http://www3.weforum.org/docs/GITR/2014/GITR_OverallRanking_2014.pdf

Yrrivaren, J. (2010). *El éxito percibido en la consultoría en tecnología de información: Un estudio de caso. Tesis para obtener el grado de doctor.* Lima: Pontificia Universidad Católica del Perú.