**CREATION OF FIRMS AND ECONOMIC GROWTH:**

**A REGIONAL ANALYSIS OF COLOMBIA**

**ABSTRACT PROPOSAL**

The resilience with which emerging economies buffered and even excelled during the recent economic contraction astounds academic researchers and practitioners alike. Most Asian and Latin American countries have enjoyed positive and increasing economic growth rates during the last years, this has not been the case for the United States and most of Western Europe. Considering this scenario and the recent significant advances in security, the country of Colombia represents an interesting case study. The number of new firms created in this country nearly doubled in the last five years of the previous decade, from 29,118 in 2006 to 42,172 in 2010 (DANE, 2012), and, coinciding with what economic and business theory would predict, the country’s growth rate has been positive. With the objective of analyzing the relationship of both tendencies, the objective of this dissertation is to accurately determine the financial, economic and socio-political factors that foster enterprise creation, enterprise creation per economic activity, and net exports in Colombia.

Recognizing the stark heterogeneity that exists among the Colombian regions, the proposed analysis on creation of firms and net exports is performed at a departmental level using a very comprehensive data set that includes ample statistics on a broad range of factors of interest for the 32 departments and the capital of the country for the 2006-2010 period. The methodology used is panel data analysis with fixed effects. The results show that the rate of time deposits to GDP, the rate of capital income to GDP, the rate of total trade to GDP and the secondary school enrollment rate have a positive and significant relationship with the creation of enterprises. The coefficient for the interest rate is negative and significant at 5% level. These findings are consistent with the standing literature. Furthermore, the analysis per economic activities presents specific and interesting patterns.

**Introduction**

The academic literature in international business theory is clear on the existing relationship between a country’s capacity for the creation of enterprises and economic development. This dogma of the discipline is sustained when we consider that (i) an increasing number of entrepreneurs foster productivity, i.e., a source of economic growth (Schumpeter, 1934; King and Levine, 1993b); (ii) new enterprises create new jobs (Wennerkers and Thurik, 1999; Beugelsdijk and Noorderhaven, 2004); and (iii) new companies are a main consequence of innovation activities (Drucker, 1999; Dejardin, 2000; Audretsch, 2002).

The resilience with which emerging economies buffered and even excelled during the recent economic contraction astounds academic researchers and practitioners alike. Most Asian and Latin American countries have enjoyed positive and increasing economic growth rates during the last years, this has not been the case for the United States and most of Western Europe. Considering this scenario and the recent significant advances in security, the country of Colombia represents an interesting case study. As a result of the significant shift in worldwide perception of the country and the rising world prices of commodity goods, the country has witnessed impressive increases in its inflow of foreign direct investment (see **Table 1**) and has become an important international supplier of natural resources (e.g., oil, oil products and coal) with positive consequences for economic growth. Additionally, the economic development of the country has allowed some specific programs for poverty reduction.

**Table 1: Colombian total exports and principal traditional exports**

**2006 - 2010[[1]](#footnote-1)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Year | Total traditional exports | Coffee | Coal | Oil and oil products | Ferronickel | Total exports |
| 2006 | 11,809.51 | 1,461.24 | 2,912.97 | 6,328.25 | 1,107.05 | 24,390.98 |
| 2007 | 14,207.02 | 1,714.34 | 3,494.54 | 7,317.86 | 1,680.28 | 29,991.33 |
| 2008 | 20,002.81 | 1,883.22 | 5,043.33 | 12,212.58 | 863.68 | 37,625.88 |
| 2009 | 17,952.52 | 1,542.70 | 5,416.39 | 10,267.50 | 725.93 | 32,846.33 |
| 2010 | 25,367.70 | 1,883.56 | 6,015.18 | 16,501.62 | 967.34 | 39,713.34 |

 **Source:** Bank of the Republic of Colombia

Colombia is divided into 32 departments, as it is possible to observe in **Graphic 1**, grouped in 6 economic regions following similar characteristics between them (see appendix). Approximately a 58% of the population is concentrated in the Center-East and the Caribbean regions and the Orinoquia and the Amazonia ones are the less populated with just 6% of the total. The departments with higher GDP per capita are the ones involved in oil extraction (Casanare, Arauca y Meta), which no necessarily means they are the ones with better social indicators and better infrastructure, but are an example of the importance of this activity for the country. Even though, there is decentralization, for the majority of the departments, transfers from the central government are an important source of resources.

**Graphic 1: Colombian departments and economic regions**

**Source:** http://colombiasinpalabras.blogspot.com/2012/04/mapa-de-colombia.html

The number of new firms created in Colombia nearly doubled in the last five years of the previous decade, from 29,118 in 2006 to 42,172 in 2010 (DANE, 2012), and the data from Bogota – Cundinamarca, which is the department where more than 50% of the firms were created (53.49% in 2006 and 51.74% in 2010), shows that most of these new firms are micro-enterprises (see **Table 2**). Coinciding with what economic and business theory would predict, the country’s growth rate had positive values over the same period. With the main goal of analyzing the relationship of both tendencies, the objective of this dissertation is to accurately determine financial, economic and socio-political factors that foster enterprise creation, enterprise creation per economic activity, and net exports in Colombia.

**Table 2: Firms created in Bogota – Cundinamarca by size**

**2005 and 2010**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Number of new enterprises | 2005 | % | 2010 | % |
| Colombia | 29,118 |   | 42,172 |   |
| Bogota - Cundinamarca | 15,574 | 53.49% | 21,818 | 51.74% |
| *Big firms* | 47 | 0.30% | 37 | 0.17% |
| *Medium-size firms* | 135 | 0.87% | 138 | 0.63% |
| *Small-size firms* | 602 | 3.87% | 802 | 3.68% |
| *Micro-enterprises* | 14,790 | 94.97% | 20,841 | 95.52% |

 **Source:** DANE, 2012

We believe that financial, economic and socio-politic indicators such as the departments’ level of financial deepening, the degree of international trade openness and secondary school enrollment rate determine enterprise creation and net exports in Colombia. Recognizing the stark heterogeneity that exists among the Colombian regions, the proposed analysis on firms creation and net exports is performed at a departmental level using a very comprehensive data set that includes ample statistics on a broad range of factors of interest for the 32 departments for the 2006-2010 period. The methodology used is panel data with fixed effects.

The rest of the document is structured as follows, the next section reviews relevant theoretical elements gathered from the standing literature. Section 3 is the proposal discussion. Section 4 includes data sources, definition and analysis. Section 5 explains the model and methodology for the panel data study. Section 6 presents the results, and the last section contains a final discussion, concluding remarks and possible future research venues.

**Literature review**

Authors such as Wennekers and Thurik (1999) highlight the relevance of two related phenomena of the 1980s and 1990s: the revival of entrepreneurship and the resurgence of small business as consequence of world dynamics. More than a decade after, these elements continue to be relevant given the economic crisis evident worldwide and the increasing importance of the emerging economies. The existing relationship between a country’s capacity for the creation of enterprises and economic development is sustained when we consider that (i) an increasing number of entrepreneurs foster productivity, i.e., a source of economic growth (Schumpeter, 1934; King and Levine, 1993b); (ii) new enterprises create new jobs (Wennerkers and Thurik, 1999; Beugelsdijk and Noorderhaven, 2004); and (iii) new companies are a main consequence of innovation activities (Drucker, 1999; Dejardin, 2000; Audretsch, 2002).

The academic literature on the determinants of enterprise creation focuses on six areas: (i) the level of financial deepening (e.g. King and Levine, 1992, 1993ab); (ii) the development of the banking sector and stock market (e.g. Deidda and Fattouh, 2008); (iii) the educational attainment of the population (e.g. Baldwin and Borrelli, 2008); (iv) the level of openness of the country and foreign direct investment (FDI) (e.g. Alfaro, 2003; Andersen and Babula, 2008); (v) the persistence of corruption and violence in developing countries (e.g. Gómez-Portilla and Gallón-Gómez, 2002; Angrist and Kugler, 2008); and (vi) the preference of cross-region analysis vs. cross-country analysis (e.g. Levine and Renelt, 1991).

*The level of financial deepening*

Financial deepening refers to the increased provision of financial services with a wider choice of services geared to all levels of society. This allows the access to health and education, thus having an impact on economic growth and poverty reduction. By allocating credit, mobilizing savings, providing payment services and allowing participants to pool, trade and price risk financial systems [and specially banks] may improve the allocation of resources, the flow of information and the management of firms in ways that promote economic development (e.g. King and Levine, 1992 and Levine and Renelt, 1991).

The literature that tests the relationship between financial indicators and economic growth, e.g. King and Levine (1992), concludes that these indicators are significantly correlated with growth in cross-country regressions and this relationship remain significant after controlling for initial income, initial human capital, dummy variables for countries in Subsaharan Africa and Latin America, and measures of trade, fiscal, and inflation performance (see also Deidda, 2006; Deidda and Fattouh, 2001; King and Levine 1993a; and Levine, 1997 for more evidence).

*The development of the banking sector and stock market*

Levine and Renelt (1991) mention that financial institutions and instruments have been integral parts of economic activity for more than two hundred years. Within the most important financial instruments we can count demand and time deposits, but bonds, equities, options and forward contracts also play relevant economic roles. Similarly, banks have been the more ubiquitous financial institutions, but the stock market is becoming increasingly important in countries of all sizes.

 The empirical findings in Deidda and Fattouh (2008), suggest that both bank and stock market development have a positive effect on economic growth, but the growth impact of bank development is lower the higher is the level of stock market development. On the other hand, banking concentration has mixed effects on economic growth. It induces economies of specialization, which is beneficial to growth, but at the same time it duplicates banks’ investment in fixed capital, which is detrimental to growth; reducing concentration is more likely to promote growth in low-income countries than in high-income ones (Deidda and Fattouh, 2005).

*The educational attainment of the population*

The theoretical foundation for asserting that education has a positive effect on economic growth is derived from human capital theory, which originally asserts that skills, knowledge, abilities, experiences, aptitude, and training are human capital that, like physical capital, accrue a stream of future benefits when developed (Baldwin and Borrelli, 2008). The authors also emphasize that education increase productivity labor and more highly educated individuals are better consumers. As an engine of economic growth, education enhances both private and public benefits that are ultimately reflected in measures such as per capita income (Evans and Oneal, 1995 cited in Baldwin and Borrelli, 2008).

 Although in most of the studies that include education as part of the cross-country regression, the coefficient in the relationship with economic growth is positive and significant, studies that exclusively relate these two variables present mixed results. For example, Barro and Sala-i-Martin (1995) and Banhabib and Spiegel (1994) conclude that the change in schooling has an insignificant effect if it is included in a GDP growth equation (Krueger and Lindahl, 2000). While the results in Baldwin and Borrelli (2008) indicate that spending on higher education and highway expenditures demonstrate a positive association with growth in per capita income from 1988 to 2005 in the case of the United States.

*The level of openness of the country and foreign direct investment*

Andersen and Babula (2008) conclude that there is likely to be a positive relationship between international trade and economic growth, but the way openness is measured presents some challenges that still have to be solved and the ability of developing countries to gain productivity growth to trade liberalization depends on their capacity of investment in education facilities, property rights and strengthen institutions. Some authors, e.g. Rodríguez and Rodrik (2000) argue that the relation between openness and growth is still an open question (Lee, Ricci and Rigobon, 2004).

 Furthermore, the increasing amount of FDI that is arriving to emerging economies and its historical patterns also rise the question of its influence on economic growth. Alfaro (2003) in an empirical analysis using FDI cross-country data for the period 1981-1999 divided in primary, manufacturing and services sectors, concludes that FDI in the primary sector tend to have a negative effect on growth, while investment in manufacturing has a positive one; however, evidence from the services sector is ambiguous.

*The persistence of corruption and violence in developing countries*

Colombia is a country with a long history of violence, corruption and drug trafficking. Even though, the perception of security and the data on FDI, economic growth and poverty reduction are positive, there is still some way to go in the task of fixing these problems. Angrist and Kugler (2008) found that coca production does not bring wealth to the growing region, but it is related to an increase in self-employment income and inequality; also, violence grows where there is a bigger coca crop area. Besides, Gómez-Portilla and Gallón-Gómez (2002) conclude that there is a negative and significant relationship between corruption and economic growth.

 Cross-country studies such as Barro (1991) include variables for political instability given its influence on economic growth; some examples are the number of revolutions and coups per year and the number per million population of political assassinations per year. Taking into account specific features of the Colombian economy, we include in the study indicators of transparency, homicides and forced displacement of individuals.

*The preference of cross-region analysis vs. cross-country analysis*

Commonly, empirical studies of economic growth regress the average rate of growth for a collection of countries on a set of explanatory variables. This represents some difficulties, such as the impossibility of quantify the importance of country-specific factors in growth and a mixture of measurement of variables at each country (Levine and Renelt, 1991).

 Trying to obtain more specific results, studies such as Nazmi and Ramírez (1997) go to a more disaggregated level analyzing the case of Mexico and the influence of public and private investment on economic growth. Also, Sayang and Huang (2009) study the relationship between entrepreneurship and economic development thought the case of a specific program call EMPRETEC.

**Proposal discussion**

Most of the literature linking private investment in the form of enterprise creation and financial, economic and socio-political indicators is mostly based on cross-country regressions and little has been done in the case of specific nations and at a disaggregated level such as economic activity. Taking this into account, this dissertation expands the existing literature by choosing a country that has experienced a notable improvement on its economy, where enterprise creation has played an important role. In addition, the uniqueness and broadness of the data set used in the analysis make possible to capture important characteristics of the country and its regions and, consequently, allow higher robustness of the results.

It is worth emphasizing that this is the first cross-regional study of growth though enterprise creation that uses and constructs (1) panel data methodology with fixed effects and (2) a combination of financial, economic and socio-political indicators that capture the reality of a specific country. Thus, this is the first study that we are aware of that analyzes the empirical linkages between relevant financial, economic and socio-political factors that foster enterprise creation, enterprise creation per economic activity, and net exports in the case of an emerging economy.

**Description of the data**

The analyzed data set extends from 2006 to 2010 and gathers financial, economic and socio-political information for each of the 32 Colombian departments and Bogota. Limitations in the availability of data made us restrict our analysis to include 18 of them[[2]](#footnote-2). The information collected includes all significant control variables consistently cited in the scientific literature. The financial indicators for each Colombian department in the data set are time deposits in banking institutions, the interest rate on commercial loans, capital income and departmental government income from natural resources extraction and transfers from the central government. The economic indicators are gross domestic product, private investment in the form of enterprise creation, imports and exports, inflation, government spending and unemployment. The socio-political indicators are secondary school enrollment rate, transparency, homicides and forced displacement of individuals.

The National Administrative Department of Statistics of Colombia (DANE, for its Spanish abbreviation) is the data source for the information at a departmental level of gross domestic product, population at 10 to 14 years of age, number of students at a secondary level, and the unemployment rate. The Regional Situation Reports are the source of data on the value of firms created, value of exports, value of imports, and the inflation rate. The value of time deposits and interest rates per bank are obtained from the Colombian Financial Superintendence. The Territorial Public Finances Division at the Colombian Central Bank is the source on statistics of capital income, the value of transfers from the central government and private resource extraction companies to departmental governments and government spending. Transparency for Colombia is the source of the transparency indicator. The presidency of the country has a special division for the protection and surveillance of the human rights and in the regional diagnosis we found information on homicides and forced displacement of individuals.

The values in **Tables 3, 4** and **5** are the sum or average of each variable for the five years period. Even though, the data of the interest rate by department is not available at any source, we have the amount of commercial loans for each of them and the interest rate per bank that allows us to make a proxy. Capital income, for this study, is composed of the capital income and property income accounts within the fiscal situation reports of each department. The data of the inflation rate for the 2006 to 2008 period is available just for the 13 main capital cities and for the years 2009 and 2010 is available for 24 of them; then, what we do for the rest of the departments is averaged the available data within each region and take that value as a proxy. In the case of the unemployment rate, the data was available for 24 departments, including Bogota, and we also follow the previous described process.

Time deposits are an amount of money deposit at a financial institution, especially banks, that cannot be withdrawn for a certain period of time (unless a penalty is paid). The requirement that the deposit be held for a pre-specified term, gives the bank the ability to plan how to invest those resources and in a way have more influence on financial deepening than for example deposits on checking or savings accounts. In the case of Colombia, as it is possible to observe in **Table 3**, this type of instruments are highly concentrate in the capital of the country, whose amount is almost four times higher than the 32 departments all together. The interest rate does not show a particular pattern compared to the time deposits amount, but approximately it is higher in the departments with higher available funds and lower in the less bancarized ones. On the other hand, the capital income variable includes the account of property income because the main source of them are capital contributions.

Transfers to the departmental government come mainly from the central government and private resource extraction companies. The destination of these resources has to be social investment and infrastructure. For the majority of the departments, the central government is the most important source of resources, except for Casanare, Meta y Arauca whose main income (more than 60%) comes from oil extraction and La Guajira which is one of the most important departments in coal extraction; these kind of transfers are called royalties.

The data in **Table 4**, related to the economic indicators per region, shows that the departments with higher GDP per capita are the ones involved in oil extraction, which not necessarily means they are the ones with better social indicators and better infrastructure, but are an example of the importance of this activity for the country. Even though, Bogota is in the middle of the country and does not have direct access to ports, it concentrates an important portion of the Colombia’s international trade and also it is the center of enterprise creation in value, followed by the West region that is the origin of two of the three Colombian multilatinas. The government spending is higher in the departments whose capital city is one of the 13 principal ones in the country.

**Table 3: Financial indicators per region**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Time deposits****(Sum)****Millions of pesos** | **Interest Rate****(Average)****Percentage** | **Capital income****(Sum)****Millions of pesos** | **Transfers****(Sum)****Millions of pesos** |
| **Center East Region** | **29,213,139** | **14.66** | **465,297** | **5,469,362** |
| **1** | +Bogota | 27,275,429 | 14.24 | 330,221 | 2,755,044 |
| **2** | Boyaca | 336,130 | 14.40 | 27,501 | 437,590 |
| **3** | Cundinamarca | 364,393 | 14.51 | 36,569 | 569,204 |
| **4** | Huila | 163,516 | 15.06 | 17,151 | 452,622 |
| **5** | Norte de Santander | 246,987 | 14.70 | 3,712 | 277,490 |
| **6** | Santander | 541,859 | 14.62 | 37,966 | 543,248 |
| **7** | Tolima | 284,821 | 15.04 | 12,173 | 434,161 |
| **Caribbean Region** | **1,265,679** | **14.51** | **168,249** | **2,492,313** |
| **1** | Atlantico | 543,370 | 14.71 | 13,763 | 232,460 |
| **2** | Bolivar  | 296,683 | 14.67 | 23,162 | 400,264 |
| **3** | Cesar | 87,981 | 14.23 | 42,777 | 414,714 |
| **4** | Cordoba | 94,135 | 14.43 | 18,089 | 458,128 |
| **5** | La Guajira | 51,991 | 14.33 | 27,956 | 406,042 |
| **6** | Magdalena | 105,139 | 14.54 | 29,618 | 276,888 |
| **7** | San Andres y Providencia | 27,029 | 14.73 | 7,318 | 56,992 |
| **8** | Sucre | 59,347 | 14.45 | 5,563 | 246,822 |
| **Pacific Region** | **2,140,119** | **14.68** | **38,590** | **1,526,574** |
| **1** | Cauca | 146,754 | 14.97 | 19,939 | 384,819 |
| **2** | Choco | 16,646 | 14.19 | 577 | 168,783 |
| **3** | Narino | 211,675 | 14.91 | 8,760 | 335,430 |
| **4** | Valle del Cauca | 1,765,043 | 14.64 | 9,312 | 637,540 |
| **West Region** | **2,229,542** | **14.79** | **202,550** | **1,459,021** |
| **1** | Antioquia | 1,381,295 | 14.63 | 157,662 | 1,053,185 |
| **2** | Caldas | 344,352 | 14.70 | 18,555 | 216,270 |
| **3** | Quindio | 161,312 | 15.17 | 11,091 | 78,697 |
| **4** | Risaralda | 342,582 | 14.66 | 15,241 | 110,869 |
| **Orinoquia Region** | **265,413** | **13.95** | **91,993** | **1,728,307** |
| **1** | Arauca | 21,713 | 14.14 | 27,977 | 289,376 |
| **2** | Casanare | 24,074 | 14.22 | 29,364 | 603,468 |
| **3** | Guainia | 335 | 12.93 | 1,153 | 49,062 |
| **4** | Guaviare | 1,939 | 15.46 | 5,278 | 71,400 |
| **5** | Meta  | 212,941 | 14.48 | 26,311 | 610,403 |
| **6** | Vaupes | 444 | 12.93 | 904 | 40,045 |
| **7** | Vichada | 3,964 | 13.48 | 1,004 | 64,550 |
| **Amazonia Region** | **45,674** | **14.37** | **7,249** | **366,159** |
| **1** | Amazonas | 4,804 | 14.62 | 1,461 | 73,170 |
| **2** | Caqueta | 29,861 | 13.88 | 1,978 | 94,913 |
| **3** | Putumayo | 11,007 | 14.60 | 3,809 | 198,076 |

**Table 4: Economic indicators per region**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **GDP per capita****(average)****Millions of pesos** | **Creation[[3]](#footnote-3)****(sum)****Millions of pesos** | **Trade****(sum)****Millions of pesos** | **Inflation****(Average)****Percentage** | **Government spending****(sum)****Millions of pesos** | **Unemployment****(Average)****Percentage** |
| **Center East Region** | **13.1** | **2,342,599** | **49,575,977** | **5.09** | **11,054,847** | **10.92** |
| **1** | +Bogota | 16.8 | 2,133,578 | 34,223,921 | 4.46 | 6,551,017 | 10.83 |
| **2** | Boyaca | 10.1 | 38,496 | 516,622 | 4.87 | 653,754 | 9.51 |
| **3** | Cundinamarca | 9.8 | NA | 11,407,651 | 4.46 | 1,450,601 | 10.26 |
| **4** | Huila | 7.9 | 18,502 | 103,520 | 5.66 | 579,595 | 10.85 |
| **5** | Norte de Santander | 6.2 | 47,171 | 1,488,430 | 5.70 | 415,803 | 10.95 |
| **6** | Santander | 16.6 | 87,468 | 1,691,915 | 5.28 | 797,514 | 9.39 |
| **7** | Tolima | 7.9 | 17,381 | 143,917 | 5.17 | 606,561 | 14.64 |
| **Caribbean Region** | **7.6** | **207,249** | **20,103,768** | **4.97** | **3,385,249** | **11.34** |
| **1** | Atlantico | 8.2 | 90,734 | 6,456,534 | 5.12 | 527,928 | 11.11 |
| **2** | Bolivar  | 9.6 | 35,634 | 8,110,450 | 5.22 | 495,142 | 10.37 |
| **3** | Cesar | 9.5 | 5,754 | 1,367,303 | 5.33 | 556,979 | 12.27 |
| **4** | Cordoba | 6.1 | 18,307 | 286,490 | 4.44 | 565,087 | 13.50 |
| **5** | La Guajira | 7.3 | 5,096 | 1,299,618 | 4.89 | 455,660 | 11.64 |
| **6** | Magdalena | 5.4 | 14,339 | 2,399,828 | 4.93 | 380,124 | 10.33 |
| **7** | San Andres y Providencia | 9.7 | 31,612 | 8,522 | 5.05 | 95,018 | 11.34 |
| **8** | Sucre | 4.6 | 5,771 | 175,020 | 4.83 | 309,307 | 10.18 |
| **Pacific Region** | **8.2** | **215,115** | **11,828,572** | **3.97** | **2,096,081** | **12.67** |
| **1** | Cauca | 5.1 | 24,398 | 914,894 | 4.04 | 457,637 | 10.13 |
| **2** | Choco | 4.1 | 1,966 | 74,375 | 3.92 | 205,404 | 12.75 |
| **3** | Narino | 4.5 | 15,045 | 777,777 | 3.78 | 411,201 | 15.09 |
| **4** | Valle del Cauca | 11.1 | 173,705 | 10,061,524 | 4.12 | 1,021,839 | 12.72 |
| **West Region** | **9.8** | **328,320** | **17,350,443** | **4.44** | **3,222,384** | **13.92** |
| **1** | Antioquia | 10.7 | 251,875 | 14,933,394 | 4.86 | 2,470,495 | 12.16 |
| **2** | Caldas | 7.8 | 20,598 | 1,455,145 | 4.00 | 370,198 | 12.49 |
| **3** | Quindio | 6.9 | 16,008 | 121,711 | 4.25 | 143,334 | 16.41 |
| **4** | Risaralda | 7.9 | 39,837 | 840,191 | 4.64 | 238,356 | 14.61 |
| **Orinoquia Region** | **17.4** | **48,506** | **318,942** | **4.90** | **2,112,345** | **10.59** |
| **1** | Arauca | 19.4 | 3,087 | 89,780 | 4.90 | 386,128 | 10.59 |
| **2** | Casanare | 26.4 | 13,108 | 129,316 | 4.90 | 722,881 | 10.59 |
| **3** | Guainia | 4.2 | NA | 918 | 4.90 | 59,802 | 10.59 |
| **4** | Guaviare | 4.2 | 211 | 94 | 4.90 | 94,144 | 10.59 |
| **5** | Meta  | 17.1 | 32,100 | 86,406 | 4.90 | 728,827 | 10.59 |
| **6** | Vaupes | 2.8 | NA | 477 | 4.90 | 43,740 | 10.59 |
| **7** | Vichada | 5.3 | NA | 11,949 | 4.90 | 76,820 | 10.59 |
| **Amazonia Region** | **5.1** | **5,076** | **51,661** | **4.68** | **425,154** | **10.82** |
| **1** | Amazonas | 4.7 | 3,167 | 33,177 | 4.68 | 79,693 | 10.82 |
| **2** | Caqueta | 4.6 | 1,909 | 4,294 | 4.68 | 129,231 | 10.82 |
| **3** | Putumayo | 5.7 | NA | 14,189 | 4.68 | 216,229 | 10.82 |

**Table 5: Socio-political indicators per region**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Population****(sum)****Individuals** | **Secondary enroll rate****(Average)****Percentage** | **Transparency****(Average)****Punctuation** | **Homicides****(sum)****Individuals** | **Forced displacement****(sum)****Individuals** |
| **Center East Region** | **16,514,351.20** | **0.96** | **71.47** | **3,942.00** | **39,344.67** |
| **1** | +Bogota | 7,154,775.00 | 1.08 | 71.51 | 1,397.83 | 704.83 |
| **2** | Boyaca | 1,263,086.60 | 0.97 | 71.84 | 165.67 | 1,250.50 |
| **3** | Cundinamarca | 2,397,754.40 | 1.05 | 71.51 | 402.33 | 2,863.17 |
| **4** | Huila | 1,054,456.00 | 0.86 | 63.53 | 407.50 | 7,217.67 |
| **5** | Norte de Santander | 1,276,011.40 | 0.88 | 71.18 | 669.67 | 6,849.50 |
| **6** | Santander | 1,989,446.60 | 0.97 | 81.07 | 496.33 | 5,776.50 |
| **7** | Tolima | 1,378,821.20 | 0.91 | 69.63 | 402.67 | 14,682.50 |
| **Caribbean Region** | **9,481,592.60** | **0.89** | **61.22** | **2,437.17** | **60,104.67** |
| **1** | Atlantico | 2,255,140.20 | 0.97 | 71.33 | 550.50 | 675.00 |
| **2** | Bolivar  | 1,938,263.80 | 0.97 | 62.04 | 417.83 | 13,710.00 |
| **3** | Cesar | 941,209.00 | 0.86 | 55.92 | 307.83 | 8,588.17 |
| **4** | Cordoba | 1,535,761.40 | 0.95 | 71.06 | 386.83 | 8,809.17 |
| **5** | La Guajira | 763,627.40 | 0.60 | 55.60 | 254.67 | 5,812.00 |
| **6** | Magdalena | 1,180,412.40 | 0.89 | 50.09 | 368.17 | 18,180.00 |
| **7** | San Andres y Providencia | 72,182.00 | 0.87 | 58.69 | 9.67 | 0.33 |
| **8** | Sucre | 794,996.40 | 1.03 | 65.05 | 141.67 | 4,330.00 |
| **Pacific Region** | **7,659,177.60** | **0.77** | **63.23** | **4,650.83** | **59,458.50** |
| **1** | Cauca | 1,298,187.40 | 0.76 | 64.14 | 584.00 | 14,225.00 |
| **2** | Choco | 467,164.20 | 0.62 | 45.49 | 137.50 | 7,736.00 |
| **3** | Narino | 1,599,929.60 | 0.73 | 70.69 | 719.83 | 24,450.67 |
| **4** | Valle del Cauca | 4,293,896.40 | 0.98 | 72.59 | 3,209.50 | 13,046.83 |
| **West Region** | **8,343,962.80** | **0.99** | **74.42** | **3,904.17** | **34,516.67** |
| **1** | Antioquia | 5,911,758.40 | 0.97 | 71.21 | 2,408.17 | 28,387.50 |
| **2** | Caldas | 974,500.00 | 1.02 | 77.86 | 516.17 | 3,807.83 |
| **3** | Quindio | 543,579.40 | 1.03 | 73.18 | 273.00 | 734.33 |
| **4** | Risaralda | 914,125.00 | 0.97 | 75.43 | 706.83 | 1,587.00 |
| **Orinoquia Region** | **1,628,970.60** | **0.71** | **55.21** | **1,098.21** | **27,419.04** |
| **1** | Arauca | 241,421.40 | 0.97 | 67.47 | 244.67 | 7,491.50 |
| **2** | Casanare | 313,475.80 | 0.97 | 66.75 | 139.33 | 1,174.17 |
| **3** | Guainia | 37,085.40 | 0.43 | 42.71 | NA | NA |
| **4** | Guaviare | 100,219.40 | 0.55 | 47.18 | 117.67 | 3,875.00 |
| **5** | Meta  | 835,632.60 | 0.95 | 64.09 | 552.67 | 11,557.00 |
| **6** | Vaupes | 40,643.20 | 0.52 | 45.29 | 8.91 | 429.44 |
| **7** | Vichada | 60,492.80 | 0.59 | 52.98 | 34.97 | 2,891.93 |
| **Amazonia Region** | **826,434.80** | **0.68** | **55.76** | **667.67** | **25,611.00** |
| **1** | Amazonas | 70,316.80 | 0.70 | 52.84 | 9.67 | 89.67 |
| **2** | Caqueta | 436,618.20 | 0.67 | 61.93 | 367.00 | 15,368.17 |
| **3** | Putumayo | 319,499.80 | 0.66 | 52.51 | 291.00 | 10,153.17 |

Following **Table 5**, approximately a 58% of the population is concentrated in the Center East and the Caribbean regions and the Orinoquia and the Amazonia ones are the less populated with just 6% of the total. The region with the highest secondary school enrollment rate is the West, that also has the highest transparency index and the regions with the lowest rate are the Orinoquia and the Amazonia, which seem to be the ones with higher corruption levels. The Caribbean and the Pacific regions have the highest numbers of forced displaced individuals from the Colombian internal conflict. The homicides are also higher in the Pacific region, followed by the Center East and West regions, respectively.

**Table 6: Economic activities - selected departments[[4]](#footnote-4)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Commodities** | **Transformation and utilities** | **Trade and consumer services** | **Finance and industrial services** | **Social services and education**  |
| **Antioquia** | 20,493 | 47,015 | 45,747 | 109,486 | 19,217 |
| **Atlántico** | 8,379 | 16,852 | 18,066 | 46,834 | 5,130 |
| **Bogotá - Cundinamarca** | 119,775 | 423,576 | 406,075 | 1,058,525 | 70,062 |
| **Boyacá** | 8,027 | 5,470 | 5,223 | 17,279 | 2,510 |
| **Caldas** | 1,370 | 4,595 | 4,110 | 9,442 | 1,054 |
| **Caquetá** | 93 | 343 | 495 | 191 | 786 |
| **Cauca** | 298 | 17,839 | 1,955 | 1,450 | 2,480 |
| **Chocó** | 271 | 644 | 790 | 279 | 114 |
| **Huila** | 1,809 | 5,950 | 2,717 | 4,987 | 3,039 |
| **Magdalena** | 3,459 | 2,348 | 3,507 | 4,321 | 702 |
| **Meta - Guainía - Vaupés - Vichada**  | 4,490 | 7,085 | 8,027 | 6,944 | 5,540 |
| **Nariño** | 2,030 | 3,242 | 2,734 | 3,350 | 4,518 |
| **Norte Santander** | 1,697 | 13,277 | 19,272 | 6,706 | 5,892 |
| **Quindío** | 2,772 | 4,114 | 4,308 | 3,376 | 1,438 |
| **Risaralda** | 3,107 | 8,855 | 10,403 | 13,154 | 4,316 |
| **Santander** | 5,111 | 17,566 | 12,646 | 16,816 | 35,089 |
| **Tolima** | 2,955 | 2,379 | 4,251 | 2,654 | 5,140 |
| **Valle del Cauca** | 9,346 | 24,451 | 37,562 | 89,911 | 13,927 |

**Table 6** shows the data of the average value from 2006 to 2010 of enterprise creation for the 18 selected departments divided into 5 categories: (i) agricultural and extraction activities; (ii) industry, construction and electricity, gas, water and vapor supply; (iii) wholesale and retail, repair, hotels and restaurants; (iv) transport, storage, communication, finance and real state activities; and (v) education and other services. Bogota-Cundinamarca and Antioquia have the highest values in all categories, respectively, except for education and other services, where Santander is the second most important department. Within them, the most important activities are transport, storage, communication, finance and real state business.

The departments whose most important activity is agriculture have higher values in the first category than those related to extraction of minerals and oil; although, it is important to highlight that the table does not have the information of two of the three most important oil sources (Arauca and Casanare). For the case of the Pacific region, the most relevant economic activity is the second one and the third one seems to be the most relevant for the Amazonia and Orinoquia regions.

**Model and methodology**

The modeling environment formulated on the seminal papers of King and Levine (1992, 1993a) is adopted and further augmented for this study. **Equation (1)** represents the regression model. For each Colombian department *i* at year *t*, the ratio of the value of enterprise creation to GDP for the whole economy and each of the five economic activities *j*, is regressed against the ratio of time deposits in banks to GDP, the interest rate of commercial loans, the ratio of capital income to GDP, the ratio of transfers to GDP, the ratio of exports plus imports to GDP, the inflation rate, the ratio of government spending to GDP, the unemployment rate, the secondary school enrollment rate, a transparency index, the homicide rate and the rate of individuals forcedly displaced.

$$\frac{I\_{i,t}^{j}}{GDP\_{i,t}}=β\_{0,i}+β\_{1}LLY\_{i,t} +β\_{2}i\_{i,t}+β\_{3}\frac{Kinc\_{i,t}}{GDP\_{i,t}}+β\_{4}\frac{transf\_{i,t}}{GDP\_{i,t}}+…$$

$$…+β\_{5}\frac{X\_{i,t}+M\_{i,t}}{GDP\_{i,t}} +β\_{6}π\_{i,t}+β\_{7}\frac{G\_{i,t}}{GDP\_{i,t}}+β\_{8}u\_{i,t}+β\_{9}EDU\_{i,t}+… $$

$$…+β\_{10}trans\_{i,t}+β\_{11}\frac{hom\_{i,t}}{POP\_{i,t}}+β\_{12}\frac{displ\_{i,t}}{POP\_{i,t}}+ε\_{i,t} (1)$$

Considering that the dependent variable and each of the regressors are expressed at a departmental level and extend over a five-year period, the model in **Equation (1)** is estimated using a panel data method with fixed effects (for references on this methodology see Wooldridge, 2010). This estimation method considers cross-region distinctions and allows for correlations among time periods, yielding more accurate measurements than more conventional cross-sectional methods. Having data over time for the same cross section units also has the advantage of letting us to look at dynamic relationships and control for unobserved cross section heterogeneity.

**Results**

**Table 7** displays coefficient estimates for Equation (1). Column 2 shows the results for all activities. KapInc/GDP has a positive coefficient and is significant at 10% level. The coefficients for the interest rate, XM/GDP, Educ and Transparency are significant at 5% level. LLY is significant at 1%. Except for the transparency indicator, all coefficient signs are as predicted by the literature. The adjusted R2 indicates the effectiveness of the relationships established. Financial deepening in Colombia, measured by the impact of the ratio of time deposits in banks to GDP on the creation of enterprises, is the most robust result of the analysis (for sensitivity tests see Levine and Renelt, 1992) and its level is consistent with results found in King and Levine (1992, 1993a) and Deidda and Fattouh (2008).

**Table 7: Coefficient estimates, 2006 - 2010**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Entrepr/****GDP** | **All activities** | **Commodities** | **Transformation and utilities** | **Trade and consumer services** | **Finance and industrial services** | **Social services and education**  |
| **LLY** | 0.079(4.0)\*\*\* | 0.006(1.2) | 0.024(2.0)\* | 0.003(0.4) | 0.052(3.0)\*\*\* | 0.002(0.3) |
| **i** | -0.033(2.4)\*\* | -0.005(1.4) | -0.005(0.5) | -0.003(0.4) | 0.006(0.5) | -0.002(0.3) |
| **KapInc/****GDP** | 0.913(1.8)\* | 0.137(1.1) | -0.025(0.1) | 0.256(1.5) | -0.052(0.1) | -0.085(0.4) |
| **Transfers/****GDP** | 0.082(1.6) | -0.005(0.4) | 0.060(1.9)\* | -0.019(1.0) | 0.004(0.1) | 0.015(0.6) |
| **XM/****GDP** | 0.008(2.2)\*\* | 0.001(0.8) | 0.003(1.2) | 0.002(1.4) | 0.001(0.2) | -3.5E-4(0.2) |
| **π** | 0.001(0.1) | -0.001(0.3) | -0.002(0.2) | 0.001(0.3) | 0.005(0.5) | 0.001(0.1) |
| **Gov/****GDP** | -0.005(0.1) | 1.4E-3(0.1) | -0.013(0.6) | 0.026(2.0)\* | 0.004(0.1) | -0.012(0.7) |
| **Unempl** | -4.2E-5(0.4) | 2.8E-5(1.0) | -4.5E-5(0.6) | -2.8E-5(0.7) | -5.9E-6(0.1) | 1.2E-4(2.2)\*\* |
| **Educ** | 0.013(2.2)\*\* | -0.001(0.5) | 0.013(3.4)\*\*\* | 0.001(0.5) | 0.003(0.6) | -0.001(0.2) |
| **Transparency** | -8.9E-5(2.2)\*\* | 9.4E-8(0.0) | -4.9E-5(2.0)\* | 4.3E-7(0.0) | -2.1E-5(0.6) | 6.9E-7(0.0) |
| **Homicides** | 1.419(0.5) | 0.180(0.3) | 1.407(0.8) | -0.461(0.5) | -1.259(0.5) | 1.667(1.3) |
| **Forced Displacm** | 0.050(1.0) | 0.012(1.0) | 0.008(0.2) | 0.013(0.8) | -0.037(0.8) | -0.005(0.2) |
| **R2adj** | 0.81 | 0.11 | 0.36 | 0.61 | 0.25 | -0.05 |
| **Years** | 5 | 5 | 5 | 5 | 5 | 5 |
| **Departments** | 18 | 18 | 18 | 18 | 18 | 18 |

\*\*\* 1% significance; \*\* 5% significance; \*10% significance

Moreover, columns 3 to 7 exhibit the results for the five categories of economic activities created for the study. In the case of the agricultural and extraction activities, any of the coefficients are significant, but we obtain most of the expected signs. Industry, construction, and electricity, gas water and vapor supply is positively related at 10% level with LLY and the ratio of transfers to GDP and also positively related with Educ at 1%; the coefficient for the transparency index is significant, but its sign is contrary of what expected. The third category related to wholesale and retail, repair, hotels and restaurants presents a significant positive relationship with the ratio of government spending to GDP. Transport, storage, communication, finance and real state activities, as expected, are strongly positively related to LLY. The coefficient for unemployment, in the case of education and other services, is positive and significant at 5% level.

**Discussion, concluding remarks and future research**

The results show in the previous section have some important implications for Colombian public policy. The robustness of the findings calls for the strengthening of specific financial, economical and socio-political actions such as investment on education programs, fiscal reforms for the avoidance of tax evasion and the effectiveness of the monetary policy through the interest rate. Besides, we also recommend the promotion of creation of firms for international commerce and extend the bancarization to all departments given the importance of the banking sector for the economy.

On the other hand, an extension of the present document will consider a similar modeling environment as the present study, but the dependent variable is replaced by the economic growth rate of each Colombian department. Preliminary results support the importance of financial deepening and education enrollment for fostering economic growth and transfers are also an important variable with a positive and significant relationship with GDP. This dissertation expands the existing related literature and connects the micro-level of enterprise creation and the macro-level of economic growth highlighting the importance of entrepreneurship and relevant financial, economic and socio-political factors for economic development.

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**Appendix**

The natural regions of Colombia, following Transparency for Colombia and including Bogota, are:

1. **Center East Region**
	1. +Bogota
	2. Boyaca
	3. Cundinamarca
	4. Huila
	5. Norte de Santander
	6. Santander
	7. Tolima
2. **Caribbean Region**
	1. Atlantico
	2. Bolivar
	3. Cesar
	4. Cordoba
	5. La Guajira
	6. Magdalena
	7. San Andres y Providencia
	8. Sucre
3. **Pacific Region**
	1. Cauca
	2. Choco
	3. Narino
	4. Valle del Cauca
4. **West Region**
	1. Antioquia
	2. Caldas
	3. Quindio
	4. Risaralda
5. **Orinoquia Region**
	1. Arauca
	2. Casanare
	3. Guainia
	4. Guaviare
	5. Meta
	6. Vaupes
	7. Vichada
6. **Amazonia Region**
	1. Amazonas
	2. Caqueta
	3. Putumayo
1. FOB value in millions of dollars. [↑](#footnote-ref-1)
2. Antioquia, Atlántico, Bogotá-Cundinamarca, Boyacá, Caldas, Caquetá, Cauca, Chocó, Huila, Magdalena, Meta-Guainía-Vaupés-Vichada, Nariño, Norte de Santander, Quindío, Risaralda, Santander, Tolima and Valle del Cauca. Within this list there are two groups of departments given that this is the way they are presented in the available data of enterprise creation. [↑](#footnote-ref-2)
3. Meta includes the values of Guainia, Vaupes and Vichada and Bogota includes the values for Cundinamarca. [↑](#footnote-ref-3)
4. Values in millions of Colombian pesos [↑](#footnote-ref-4)