



**Gender and Entrepreneurial Performance in Democratic  
Republic of Congo**

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**Abstract**

This study aims to evaluate the influence of gender on the entrepreneurial performance in Democratic Republic of Congo. Data from a survey conducted in May-June 2012 to SMEs completed by data from the 2006 and 2010 World Bank's Enterprise Surveys are used. The methodology of Oaxaca (1973) and Blind (1973) allowed us to explore the influence of gender on entrepreneurial performance and to bring out the differences of performance.

The results suggest that, female managed and/or owned firms are less effective in terms of number of employees than their male counterparts. But relatively to male entrepreneurs, female entrepreneurship influences positively the performance of firm in terms of growth of annual sales.

**Keywords:** Gender, Entrepreneurship, Firm performance, Democratic Republic of Congo.

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## **1. Introduction and background**

The third Millennium Development Goal refers to the promotion of gender equality and empowering women. One of various ways that women are empowered is by being able to work in a paid job or run their own business. Entering the formal economy as workers or businesswomen allows women to provide for themselves and their families, and to play their part in generating economic growth and job creation. But, in many economies finding a job or starting a business can be difficult for women, and their chances of success somewhat constrained. Women own fewer businesses, only one-third of firms in 118 economies surveyed by the World Bank have female participation in ownership, and businesses owned by women tend to have fewer employees and lower sales and invested capital (World Bank, 2010).

According to the “Women, Business and the Law-2010” report, the population of the Democratic Republic of Congo can be estimated about 64 205 366 habitants with 32 393 716 women (i.e., 50.5%) and the female labor force participation represent 55%. Moreover, the World Bank estimates the percentage of firms with female participation in ownership at 38.92; the percentage of full time female workers at 18.69 and the percentage of firms with female Top Manager at 13.68. Indeed, women typically make up a minority of the owners of registered businesses, less than 10%.

The definition of entrepreneurship in the literature is quite broad, including “self-employed” individuals (with or without employees), “owners or manager of a firm” and “innovators” (defined in various ways) (Brush, 1992). The materialization of these definitions may partly depend on data availability, but it is clear that they can reflect very different phenomenon. In this work, we define an entrepreneur as an owner/manager of a SME.

Yet, the evidence on effect of gender on firm performance is mixed. Some studies provide evidence of female underperformance (Brush, 1992; Rosa et al., 1996; Reynolds et al., 2002), while others do not find gender-based differentials (Du Rietz and Henrekson, 2002; Bardasi et al., 2008). The findings depend in part on which measure of performance is used and what other factors are being controlled for. A large body of evidence shows that female-owned enterprises are smaller, in terms of sales, assets and employment than male-owned enterprises (Chagnati and Parsuraman, 1996; Rosa, et al., 1996; Robb, 2002; Waston, 2002; Coleman, 2007). For example, Coleman (2007) finds that, in the USA, among small firms, the average male-owned business was twice as large as the average female-owned business in terms of

total sales and assets and had 50% more employees. Similarly, Chagnati and Parsuraman (1996) using US data, find that sales are twice as large in male-owned business as in female-owned business. Some studies also indicate that firms owned by women are less profitable than those owned by men. Robb and Wolken (2002) study a sample of white-owned small businesses in the U.S. and show that women owned businesses generate only 78% of the profits generated by male-owned businesses. Entwistle et al. (1995) find female Chinese business owners outperformed in terms of profit. In studies where gender differences in firm performance emerge, various explanations for these differences are proposed ranging from psychological and social differences between male and female entrepreneurs to institutional constraints. We do not focus here on these explanations.

Other studies, however, do not find female perform less when other measures of performance (such as return on equity, total factor productivity, growth of sales or employment) are used. In a study from Australia, Watson (2002) shows that women business owners earn similar rates of return on equity and assets as male business owners. Using World Bank Enterprise Survey (2002-2006), Bardasi et al. (2008) find that in Ethiopia, female-owned businesses are at least as productive as male entrepreneurs when measured by value added per worker and total factor productivity, holding constant the industry in which they work. Similarly, Kepler and Shane (2007) show that there are no significant gender differences in terms of performance outcomes of nascent entrepreneurs.

In Democratic Republic of Congo like many Sub-Saharan countries, studies addressing gender and entrepreneurial performance are not abundant in the literature. In this work, we expand previous empirical research by explaining the gender-based differences in business performance being given the unequal investment climate and business environment between female and male entrepreneurs. The remainder of the work is structured as follows: the next section II presents the objective of the study while the section III presents the methodology. In section IV we briefly present and describe data. In section V we present, analyze and discuss the results, and in section VI we conclude.

## **2. Objective**

The main aim of this study is to show how gender affects the entrepreneurial performance in Democratic Republic of the Congo. Specifically, it is a question to evaluate the influence of the gender on Congolese SMEs performance and to identify the factors of difference in firm performance between male and female entrepreneurs.

### 3. Methodology

#### 3.1 The model

Performance of SME can be measured in several ways (Davidsson, 1991; Delmar, 1997). In this work, we use the growth rate of the annual sales as well as the growth rate of the number of permanent employees to measure the performance of firm. These two measurements have advantage to inform about the economic performance as well as the social performance in terms of jobs creation (Dunkelberg and Cooper, 1982; Kinda and Loening, 2010). Therefore, our methodology consists of the identification of the influence of gender on firm growth and its determinants for female and male entrepreneurs. Besides the climate investment factors, the two key determinants of enterprise growth are age and initial size (Evans, 1987; Mc Pherson, 1996 and Fajnzylber et al., 2006). According to Evans (1987), the empirical model of firm growth is a general growth function  $g$  in size and age:

$$G = g(S_{it}, A_{it})e^{bIC} \quad (1)$$

Where  $S_{it'}$  and  $S_{it}$  are size of a firm for the period  $t'$  and in period  $t$ , respectively, and  $A_{it}$  is the age of the firm in period  $t$ . This functional relationship can be moderated through a set of investment climate variables  $IC$ . Equation (1) can be transformed into the following regression framework:

$$\frac{\ln(S_{it'}) - \ln(S_{it})}{d} = const + a_1 \ln(S_{it}) + a_2 \ln(A_{it}) + a_3 \ln(S_{it}) \times \ln(A_{it}) + \sum_{i=1}^n b_i IC + \varepsilon_{it} \quad (2)$$

Where the dependent variable corresponds to the average annual growth rate and represents the change in firm's size (measured by the annual sales and the number of workers) during two periods adjusted to the number of years ( $d$ ) during that period. ( $d$ ) Stands for the number of years over which the growth rate is measured,  $a$  and  $b$  are the coefficient vectors.

To evaluate the difference of firm growth between female and male entrepreneurs, we use the decomposition method of Oaxaca (1973) and Blinder (1973). Indeed, the mean values of the dependent variable  $y$  regressed on some independent variables,  $x$ , in data from two populations, male and female entrepreneurs, are:

$\bar{Y}_M = \bar{X}'_M \beta_M$  and  $\bar{Y}_F = \bar{X}'_F \beta_F$ , where  $\bar{X}'_M$ ,  $\bar{X}'_F$  are the vectors of means of the independent variables and  $\beta_M$ ,  $\beta_F$  the vectors of coefficients obtained by regression. Thus,



$\bar{Y}_M - Y_F = \bar{X}'_M \beta_M - \bar{X}'_F \beta_F$ . By subtracting and adding  $\bar{X}'_M \beta_M$  :

$$\bar{Y}_M - \bar{Y}_F = \bar{X}'_M \beta_M - \bar{X}'_M \beta_F + \bar{X}'_M \beta_F - \bar{X}'_F \beta_F .$$

$$\Rightarrow \bar{Y}_M - Y_F = \bar{X}'_M (\beta_M - \beta_F) + (\bar{X}'_M - \bar{X}'_F) \beta_F \quad (3)$$

The second term in the expression (3) is related with the differences between means of the independent variables and is usually known as the explained component in the sense that it is the part of the differences between mean values of the dependant variable explained by the differences between means values of independent variables. The first term is known as the unexplained component. That is the form of the Blinder-Oaxaca decomposition we use in this work as well as to evaluate the differences of entrepreneurial performance between male and female entrepreneurs and to identify the determinant of these differences.

## 3.2 Discussion of variables

### 3.2.1 Dependent variable

The objective is to explain the performance of firm according to some entrepreneurial and investment climate characteristics. Therefore, the performance of firm is measured by the growth of sales and the growth of the number of workers. Firm performance can be measured by several attributes such as turnover/sales, employment, assets, market shares, and profits. Among these measures, sales and employment are in particular broadly used as indicators for growth (Davidsson, 1991; Delmar, 1997; Ardishvili et al., 1998; Weinzimmer et al., 1998). This is because performance in sales and employment reflect both short-term and long-term changes in a firm and they are easy to obtain. Furthermore, compared to other indicators such as market shares; sales and employment are more objective measures (Delmar, 1997). In this work, firm performance is defined as the relative change in a firm's sales and number of permanent employees over a period of time. Apart from the fact that change in annual sales and number of permanent employees can serve as measure of economic performance and social performance respectively; they can be used as an indicator of entrepreneurial success (Dunkelberg and Cooper, 1982).

### 3.2.2 Independent variables

According to some theoretical and empirical works, a large set of variables can be used as regressors. For example, Grinyer et al. (1988) consider that, it's necessary to test the impact of a large number of variables simultaneously in order to create a more complete and realistic idea of the firm performance.

### ***Gender variables***

Several studies showed the higher concentration of males in business ownership in most countries of the world. According to Reynolds et al. (2002), men are about twice more likely to be involved in entrepreneurial activity than women. So, we consider some variables according to male and female business in order to measure the relative importance of female business owned. Then, information about the following questions is necessary (World Bank, 2010)<sup>2</sup>. Is the Top Manager female? Is the largest owner female? What is the number of Permanent full-time individuals that are female? What is the number of full time employees who were female production workers at the end of last fiscal year? What is the number of full time employees who were female non-production workers at the end of the last fiscal year? Note that the two first variables are dummies and are coded 1 if yes and 0 otherwise. A positive and significant relationship is expected for the “*Top Manager is Female*” dummy variable.

### ***Firm Managerial variables***

The *Human capital* is measured in terms of both generic and specific human capital. Generic human capital is measured by the level of educational attainments of Top Manager and workers. Specific human capital is measured by a dummy indicating whether workers in an enterprise have received *on-job-training* or not. Also, we take in account the *Years of Top Manager’s* managerial experience in the type of sector that the establishment presently operates. The *Firm’s legal status* is an information well known for the target respondent. A firm’s legal status is determined by whether participation on ownership is by shares or not. Another option is a combination of the previous ones. To capture the *Degree of competition* we use the main product defined by the output that generates the highest proportion of sales. The establishment’s main market is defined by the market that generates the most sales for the main product. We constructed a dummy variable which takes the code 1 if a firm can sale at the local (or national) and international market and 0 if the firm sales at the local (or national) only. A positive coefficient is expected to mean that the more diversified firm in markets should be the more effective. The purchase of fixed assets and other investments can be considered as Firm Managerial variable. The category machinery, vehicles and equipment is the annual investment of anything used directly by the firm to produce. Land, buildings is the annual investment in land, buildings and structures used directly or indirectly by this

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<sup>2</sup> See <http://www.enterprisesurveys.org>

establishment to produce goods and services. Finally, fixed assets include any indivisible purchase made by the firm. Another aspect of firm managerial and/or performance strategy variable would be the foreign participation (*percentage of foreign owned shares*) directly into the firm as a major stakeholder. So, the foreigners have incentives to provide help in managerial, production and marketing know-how.

### ***Investment Climate Variables***

Investment climate variables are generally divided into subjective and objective measures<sup>3</sup>. Subjective measures capture firm managers' own perceptions or experiences, and thus are subject to some arbitrariness and incomparability across firms and across countries. In this regard, the survey questionnaires ask the firms perception about the hard infrastructure (electricity, water, transportation, telecommunication) and soft infrastructure (problems in tax administration, custom clearance, business regulations, corruption). Using a rating index from 0 (no problem) to 4 (severe problem), we create a dummy variable of one for each problem by looking at whether the firm rates a given problem as serious/severe, and zero otherwise. If the firm answers that there are serious problems in each of the infrastructure indicators, we assign the value of 1 and 0 otherwise.

On the other hand, objective measures include: borrowing interest rates, days to clear customs for exports and imports, number of days of power outages per year, days to get power connection and days to get telephone connection once all the application procedures were completed by the firm. While firm performance is naturally affected by the surrounding economy or infrastructure (hard or soft investment climate indicators), the operating climate facing each firm should be the same regardless of firms' own capabilities.

### ***Control variables***

As control variables, we consider age, initial size of the firm, i.e., the number of permanent, full-time employees for the time that the enterprise began operations and dummy for location (Capital city Kinshasa with the code 1 and 0 otherwise). Beside these variables, we have variables according to access to finance (Checking/savings account, an overdraft facility, a line of credit, a loan), variables according to outage electricity and social capital. We use "have asset funded by other like friend, relations" as proxy of social capital (Titeca and Vervivish, 2008).

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<sup>3</sup> See the World Bank Enterprise Survey questionnaire.

### **3.3 Data**

We use primary and secondary data. Data from a survey that we conducted in May-June 2012 to enterprises operating in the Province of Nord-Kivu in Democratic Republic of Congo was combined with data from the World Bank's Enterprise Surveys of 2006 and 2010 according to key manufacturing and service sectors. We adapted our questionnaire to the questionnaire of the World Bank's Enterprise Survey in order to make possible the combination of data set. The World Bank's Enterprise Surveys use standardized survey instruments and a uniform sampling methodology to minimize measurement error and to yield data that are comparable across the world's economies. The use of properly designed survey instruments and a uniform sampling methodology enhances the credibility of analysis and recommendations that stem from this analysis. The objectives of Enterprise Survey are: (i) to provide statistically significant business environment indicators that are comparable across all of world's economies; (ii) to assess the constraints to private sector growth and enterprise performance; to build a panel of establishment-level data that will make it possible to track changes in the business environment over time, thus allowing, for example, impact assessments of reforms and policy changes; and (iii) to stimulate policy dialogue on the business environment and to help shape the agenda for reform.

The survey is implanted in two stages. In first stage the screener questionnaire is applied and the eligibility of firm is determined. In the second stage one of the two versions of the questionnaire (Manufacturing or Services) is applied. The two versions of the instrument, Manufacturing and Services are comprised of thirteen sections organized by topic according to general information, infrastructure and services, sales and supplies, degree of competition, capacity, land, crime, finance, business-government relations, labor, business environment and performance.

The primary sampling unit of the study is the establishment (small or medium enterprise). An establishment is a physical location where business is carried out and where industrial operations take place or services are provided. According to the sampling, we surveyed 90 enterprises across three cities (Goma, Beni and Butembo) in the province of Nord-Kivu in DR Congo. We thus combined these data with data resulting from World Bank Survey concerning 120 SMEs in Kinshasa, Lubumbashi, Kisangani and Matadi. The total size of the sample of the study is then 210 enterprises.

## 4. Results

### 4.1 Descriptive statistics

The following table presents some descriptive statistics according to dependent and explanatory variables. The table reports the overall mean, corresponding standard deviation for continuous variables and proportion (or the ratio) for dummy variables. It also presents summary statistics of variables according to male and female entrepreneurs. Therefore, the mean value of the growth rate of annual sales is 0.1941 (about 19.41%); with a standard deviation of 0.9327 (about 90.27%).

**Table 1:** Descriptive statistics

Variable and measure	Mean/ratio (St. deviation)	Male Top Manager	Female Top Manager
<i>Dependent variables</i>			
Growth rate of annual sales	0.19(0.93)	0.170(0.87)	0.3505(1.29)
Growth rate of number of employee	0.03(0.21)	0.042(.21)	-0.014(0.21)
<i>Independent variables</i>			
Age of the firm	14.39(9.05)	14.58(8.59)	13.14(11.71)
Location of the firm (=1 if capital city and 0 otherwise)	78.57%	79.67%	71.42%
Female Top Manager (=1 if Top Manager is female and 0 otherwise)	13.33%	0.00%	100.00%
Is the largest owner female (=1 if yes and 0 otherwise)	2.86%	0.00%	21.43%
Any female amongst owners of firm (=1 if yes and 0 otherwise)	27.62%	20.88%	71.43%
Number full-time individuals that are female	2.39(4.90)	2.39(5.23)	2.36 (1.25)
Number of production female employees	1.57(2.18)	1.49(2.24)	2.11(1.66)
Number of non-production female employees	1.75(2.12)	1.77(2.26)	1.57(0.83)
Number of employees of firm When it started	13.39(17.92)	14.26(18.86)	7.71(7.97)
Firm's legal status (=1 if shareholding company and 0 if sole proprietorship)	31.43%	47.14%	21.43%
Years of Top Manager's managerial experience	13.48(9.30)	13.69(9.03)	12.14(10.97)
No, primary school and vocational training (1 if yes and 0 otherwise)	15.24%	15.93%	10.71%
Secondary school (1 if yes and 0 otherwise)	20.95%	20.33%	25.00%
University and graduate degree (1 if yes and 0 otherwise)	63.81%	63.74%	64.29%
Average years of education of production workers	1.85(0.64)	1.84	1.96(0.50)
Percentage of workers completed high school	51.01(17.53)	50.76(18.28)	52.61(13.58)
Formal training program for permanent employees (=1 if the program exists and 0 otherwise)	11.90%	11.53%	14.29%
Percentage of non-production workers received formal training	18.92(13.81)	18.81(13.42)	19.67(16.38)
Have a line of credit or loan from a financial institution (=1 if yes and 0 otherwise)	8.10%	8.79%	3.57%
Have an overdraft facility (=1 if yes and 0 otherwise)	9.05%	9.34%	7.14%
Expenditure for purchases equipment last fiscal year (in 10x10 <sup>3</sup> US\$)	2.67(1.58)	2.87(1.78)	1.14(1.32)
Expenditure for purchases land and building in last fiscal year (in 10x10 <sup>3</sup> US\$)	5.11(48)	5.45(5.18)	2.15(2.52)
Main market in which you sold main Product or service (=1 if local/national and international and 0 if local or national market only)	8.10%	9.34%	0.00%
Use technology licensed from foreign-owned company (=1 if yes and 0 otherwise)	21.90%	21.42%	25.00%
Social capital: Have asset funded by other like friend, relations (=1 if yes and 0 otherwise)	61.90%	58.24%	85.71%

**Note:** The number of observations is 210. The mean is relative to continuous variables and ratio is for dummy variables; (...) Standard deviation.

Also, the mean value of the growth rate of number of employees is 0.0344 (about 3.44%); with a standard deviation of 0.2077 (about 20.77%). The standard deviations of these two variables are larger than the means, indicating a wide spread around the means. According to the gender, table 1 shows that the growth rate of annual sales for female firms managed is 35.05%; while it is 17.00% for male firms managed. On the other hand, with regard to the growth rate of the number of the employees; female firms managed are less effective than their male counterparts. The summary statistics suggest that the average rate of growth of the number of employees for female firms managed is -1.36% against 4.32% for their male counterparts. The average age of firms is 14.39 years in overall and 14.58 years; 13.14 years for male and female firms managed respectively. In addition, 13.33% of firms are managed by women and their average of managerial experience is 12.14 years. Only 2.86% of firms have the largest female owners and 27.62% of firms have any female amongst the owners. The average number of employees to the starting of firm is 7.71 for female firms managed against 14.26 for male firms managed. The major part of enterprises is sole proprietorship (about 68.57% against 31.43% Shareholding Company). The percentage of permanent employees who received formal training is 18.92% (18.81% for male managed firms and 19.67 for female). According to the access to finance, only 3.57% of female managed firms have a line of credit or a loan from a financial institution; while that ratio is 9.34% for male. Moreover, 7.14% of female managed firms have received an overdraft facility against 9.34% for male managed firms. Female managed firms are less competitive than their male counterparts. Indeed, 9.34% of firms managed by men can sell their products or services at the national and/or international market while female managed firm cannot do. Have asset funded by other like friends, relations, etc; is used as proxy of social capital. The ratio of female entrepreneurs who use this mode of financing is 85% against 58.24% for their male counterparts. This is interesting because, that mode of financing could make up for the deficiency of traditional finance. After presentation of these statistics according to some variables, it is interesting to carry out correlation analysis of independent and dependent variables. Therefore, according to the table of correlation in annex 1 growth of annual sales is positively correlated (0.17) with Female Top Manager; but negatively correlated (-0.03) with the growth of number of employees. Other variables are positively associated with the dependent variables; the experience of Top Manager, some variables according to education and the access to overdraft facility. In the following section, we explore the econometric relation which exists between dependant and explanatory variables. According to the results concerning variance and multicollinearity (annexes A and B), the table of correlation and the Variance Inflation

Factors (VIF) test for independent variables suggest that there is no multicollinearity and thus; econometric regressions can be made.

#### **4.2 Regression results: presentation and discussion**

Table 2 below presents regression results of variables that determine the rate of growth of annual sales and the rate of growth of number of employees (dependent variables) according to male and female entrepreneurs. In addition, using the Blinder-Oaxaca decomposition we explain the determinants of difference in entrepreneurial performance between male and female entrepreneurs.

In the following table, the education level of the Top Manager is interpreted in reference to university and graduate degree used as basic modality. The growth rate of annual sales and the age of the firm conserve both the same sign after the squared elevation; then, it allow us to find the optimum level of each variable.

##### **4.2.1 The influence of gender on entrepreneurial performance**

According to the results in the first column in the above table, gender is an important determinant of firm performance. Female Top Manager influences positively the growth of annual sales at a significant level of 1%.

**Table 2:** Regression results

variables	Determinants of Growth of annual sales			Det. of Growth of number of employees		
	Overall	Male	Female	Overall	Male	Female
Growth rate of number of employees	0.3994** (0.1611)	0.2604 (0.1736)	0.2597 (0.8910)			
Growth rate of employees squared	-0.1512** (0.0673)	-0.0879 (0.0702)	-0.3532 (0.2277)			
Growth rate of annual sales				0.0473 *** (0.0184)	0.0302*** (0.0210)	0.0164 *** (0.0591)
Growth rate of annual sales squared				-0.0257*** (0.0224)	-0.0295*** (0.0115)	-0.0257*** (0.0224)
Employees of firm when it started	0.1957*** (0.0655)	0.1529** (0.0709)	0.6275* (0.3185)	-0.0219 (0.0393)	-0.0189 (0.0434)	0.0104 (0.0176)
Age of the firm	0.0093*** (0.0038)	-0.0070* (0.0041)	-0.0312 (0.0184)	0.8937 (0.6676)	1.0177 (0.8104)	0.0925 (0.1825)
Age of firm squared	-0.0001*** (0.0001)	0.0001 (0.0001)	0.0004 (0.0003)	-0.0518 (0.0383)	-0.0568 (0.0465)	-0.0100 (0.0113)
Location	0.1770 (0.1449)	0.1133 (0.1571)	-0.0523 (0.6296)	1.1752 (1.5317)	1.4719 (1.8160)	0.1936 (0.3406)
Female Top Manager	0.3434*** (0.275)			-1.2313 (1.9720)		
Full-time individuals that are female	-0.0093 (0.0122)	-0.0111 (0.0120)	-0.1880 (0.2008)	-0.0348 (0.1295)	-0.0341 (0.1410)	0.3177* (0.1455)
Production female employees	0.0097 (0.0298)	0.0165 (0.0308)	-0.0989 (0.1316)	0.0962 (0.3153)	0.1033 (0.3591)	0.0965 (0.0905)
Non-production female employees	0.0065 (0.0312)	-0.0025 (0.0311)	-0.0270 (0.2278)	0.1357 (0.3281)	0.1656 (0.3600)	-0.0630 (0.1501)
Firm's legal status	0.1295 (0.1363)	0.1936 (0.1433)	0.1876 (0.4592)	0.4768** (0.4302)	-0.6650 (0.6699)	-0.0453 (0.3252)
Top Manager's experience	0.0175* (0.0095)	0.0182* (0.0103)	-0.0320 (0.0308)	0.0675 (0.1001)	0.0727 (0.1209)	0.0346* (0.0175)
Education of Top Manager: primary	0.3586** (0.1776)	0.2999 (0.1834)	0.7457* (0.6833)	-0.0426 (0.8704)	-0.9253 (0.1243)	0.0790 (0.4386)
Education of Top Manager: secondary	0.0195 (0.1531)	0.0588 (0.1624)	0.5528 (0.6215)	-0.0391 (0.6176)	-0.0814 (0.8824)	-0.5551 (0.3993)
Access to credit: Line of credit or loan	-0.2543 (0.2262)	-0.1899 (0.2307)	-0.3854 (0.9003)	-0.0600 (0.4094)	-0.1707 (0.6961)	0.1036 (0.6328)
Access to credit: Overdraft facility	0.6611*** (0.2165)	0.4021* (0.2270)	0.8455** (0.7665)	-0.6504 (0.3600)	-0.5675 (0.6506)	-0.2261 (0.8646)
Investment: Equipment	0.0881** (0.0374)	0.0714* (0.0397)	-0.2245 (0.2078)	-0.9378** (0.3898)	-0.1137** (0.4542)	0.2159 (0.1265)
Investment: Land and building	0.0101 (0.0340)	0.0129 (0.0334)	0.8547** (0.0543)	0.3239 (0.3593)	0.3626 (0.3887)	-0.3975** (0.6182)
Constant	-2.8886*** (0.7516)	-2.4347*** (0.7735)	-7.4365** (6.1219)	5.8072 (6.7929)	6.9168 (6.8737)	9.4659* (7.1424)
<b>Number of obs.</b>	<b>210</b>	<b>182</b>	<b>28</b>	<b>210</b>	<b>182</b>	<b>28</b>
<b>F-Stat</b>	<b>F<sub>(189)</sub><sup>(20)</sup> =3.45</b>	<b>F<sub>(162)</sub><sup>(19)</sup> =2.16</b>	<b>F<sub>(8)</sub><sup>(19)</sup> =4.21</b>	<b>F<sub>(189)</sub><sup>(20)</sup> =3.45</b>	<b>F<sub>(162)</sub><sup>(19)</sup> =2.16</b>	<b>F<sub>(8)</sub><sup>(19)</sup> =4.21</b>
<b>Prob &gt; F</b>	<b>0.0000</b>	<b>0.0052</b>	<b>0.0217</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>
<b>R-squared</b>	<b>0.2673</b>	<b>0.2021</b>	<b>0.9090</b>	<b>0.9262</b>	<b>0.2942</b>	<b>0.2120</b>

Note: The estimation method is OLS. \* p<.1; \*\* p<.05; \*\*\* p<.01. (...) indicate standard error.

The marginal effect indicates that the discrete change from Male to Female Top Manager is associated with an increase of the growth of annual sales of 34.34% (see Table 2). But even if it's not significant, Female Top manager influences negatively the growth of the number of employees. This means that female managed firms tend to have fewer employees in comparison with male managed firms. The other variables according to female business are not significant in the explanation of firm performance. In the USA, Anna et al. (2000) find that the number of women-owned businesses grew by 78% between 1987 and 1994,



accounting for 36% of all firms, but the size of such businesses remains small, both in terms of revenues and number of employees. In addition, Coleman (2007) finds that in the USA, among small firms the average male-owned business was twice as large as the average female-owned business in terms of total assets and had 50% more employees. There are other several studies in the literature which confirm the small size in terms of number of employees of female business (see for example Chagnati and Parsuraman, 1996; Rosa, et al., 1996; Robb, 2002; Waston, 2002; Coleman, 2007).

Our result concerning the favorable influence of Female Top Manager to firm performance in the context of DR Congo can be justified by different reasons related to status and managerial behavior of women. Farther in the next paragraph, we attempt to identify the origin of that advantage of Women Top Manager on the firm performance in terms of growth of rate of annual sales. Some studies in the literature present similar results (Roasa et al., 1996; Du Rietz and Henrekson, 2002; Bardasi et al., 2008). For example, Roasa et al. (1996) in their study on gender as determinant of British small business performance find that gender is a significant determinant of performance as measured by sales turnover. Female businesses are high effectives in sales turnover but under-perform in number of employees, and range of markets.

In addition to Female Top Manager, other variables determine firm performance. So, the growth rate of number of employees is an important determinant of growth of annual sales. An increase of one unit of the growth rate of number of employees implies an increase of 39.94% in the growth of annual sales. The effect of the variable “growth rate of number of employees” squared and cubic is negative. This allows us to find the optimum level of the growth rate of number of employees which can guaranty the growth of the annual sales. The optimum growth rate of the number of employees which is in accordance with the growth of annual sales is about 1.32%. Likewise, the growth of the number of employees is determined by the growth rate of the annual sales. The increase in growth rate of annual sales of 1% implies an increase in growth rate of number of employees about 4.73% in overall, 3.02% for male managed firm and 1.64% for female managed firm. The number of employees of the firm when it started influences positively the performance of firms for women and men entrepreneurs in terms of annual sales; but not significant for the growth of number of employees. The average number of employees of firm at the starting for male entrepreneurs is the double of that of the female entrepreneurs (14.26 against 7.71, see Table 1). But, the increase of annual sales due to a variation of number of employees of firm when it started is

greater for female than for male entrepreneurs. This result means that firms with great number of employees at the starting are not necessarily performing in annual sales. This explanation must be taken with precaution because the nascent firm can become ineffective when they a deficiency of number of employee which corresponds with the material and financial resources. As expected, annual sales grow with the increase in age of the firm. An increase of one year in age of the firm implies a growth of annual sales about 0.93%. But this variable is not significant for female managed firms and it has a negative influence on the growth of annual sales for male managed firms. The age of the firm has no influence on the firm performance in terms of growth of number of employees. McPherson (1996) shows for five Southern African countries that firm age has a negative impact on firm employment growth.

The firm's legal status has a positive influence on the firm performance in terms of growth of the number of employees. Firm's legal status is a dummy variable coded 1 if the firm is a shareholding company and 0 if the is a sole proprietorship. Indeed, the positive effect of that variable means that shareholding company tends to be more performing in terms of growth of employees than sole proprietorship firms. According to the influence of human capital variables, the results of this study show that the experience of the Top Manager and the primary and/or vocational education level influence positively the growth of annual sales of firms. An increase in the Top Manager's experience of one year implies an augmentation of annual sales about 1.82% for male managed firms; but there is no significant effect for female managed firms. The access to credit in terms of overdraft facility has an important positive influence on the firm performance in terms of growth of annual sales. This variable has a significant effect both on male and female managed firms at 10% and 5% of significance level respectively, but not in the same magnitude. The access to overdraft (as proxy of access to credit) for female managed firms is high advantaged for the growth of annual sales than for male managed firms. The results of the study indicate that when a woman Top Manager accesses to an overdraft facility, this is going with an increase of her growth of annual sales about 84.55%; while this percentage is about 40.21% for men Top Manager. This result emphasizes the role of credit in business performance and particularly in female business performance. The investment is also a strategic variable in the performance of female and male managed enterprises. The investment in terms of purchase of machinery, vehicles and equipments is favorable for the growth of annual sales for male managed firms but not significant (and with a negative sign) for female managed firms. The effect of this variable on the growth of the number of employees is negative. When the annual expenditure for purchase machinery, vehicles and equipments increases by a unit ( $10 \times 10^3$  US\$), the growth rate of the

number of employees decrease about 11.37% for male managed firms. On the other hand, the investment in terms of purchase of land and buildings is favorable for the growth of annual sales for female managed firms and not significant for male. Moreover, investment in terms of purchase of land and building has a negative effect on the growth of number of employees for female managed firms. An increase of a unit ( $10 \times 10^3$ US\$) in the annual expenditure purchasing land and buildings implies a decrease of the growth of employees about 39.75% for female managed firms. The result according to the investment shows that a firm can choose a strategy to invest in the machine (technology) and to reduce the utilization of human resources.

### **1.2 The gender difference in entrepreneurial performance**

The decomposition methodology of Blinder-Oaxaca (1973) allows us to evaluate and to identify the origin of the performance gap between female and male entrepreneurs. The results in annex C show that the predicted value of the growth rate of annual sales is 17.00% for male managed firms against 35.05% for female managed firms, yielding a firm performance gap between female and male entrepreneurs of 18.05%. The predicted mean value of the growth rate of annual sales of firms in overall is 19.41%. This means that female entrepreneurs are more effective in terms of growth of annual sales than male entrepreneurs. That performance difference is mainly due to difference in endowments between male and female entrepreneurs. Adjusting men's endowments levels to the levels of women would increase men's annual sales by 16.30%.

According to the gap performance in growth of number of employees, the results show that male entrepreneurs are likely more effective than their female counterparts. Therefore, the predicted value of the growth rate of the number of employees is 4.18% for male managed firms against -1.36% for female managed firms, yielding a firm performance gap between female and male entrepreneurs of 5.41%. The predicted mean value of the growth of the number of employees for firms in overall is 3.45%. This means that female entrepreneurs are less effective in terms of growth of the number of employees than male entrepreneurs. The performance difference in terms of growth of number of employees is mainly due to difference in endowments between male and female entrepreneurs by 16.77%. Adjusting women's endowments levels to the levels of men would increase women's number of employees by 1.16%.

Identifying the origin of difference in firm performance between men and women entrepreneurs, the results of the study put forward some entrepreneurial and managerial

characteristics. So, it seems that access to credit is high advantageous for female managed firms than for male managed firms. It means that female entrepreneurs have some characteristics that allow them to draw profit from the credit. Indeed, they receive small credits being given the value of the guaranties which they present but also taking account the size of their business. This situation allows female entrepreneurs to get an easy terms and an easiness of credit management.

Another managerial characteristic of difference in firm performance is the investment. Female entrepreneurs draw profit from investment in land and buildings while male entrepreneurs draw profit from investment in equipment and machines. The human capital is also a source of difference in firm performance between female and male entrepreneurs. The Top Manager experience is favorable for the growth rate of annual sales of male entrepreneurs but not for female. The experience of Top Manager is on the other hand favorable for the growth of the number of employees of female entrepreneurs. The education is high advantageous for female managed firm. While the primary education is not significant to increase the annual sales of male entrepreneurs, it is on the other hand, enough important for female entrepreneurs. This result suggests that education of women is an important determinant of the female firm performance. The analysis of McPherson (1996) highlights also the importance of the proprietor/or Manager human capital and gender for firm performance in Sub Sahara Africa.

## **5. Conclusion and Policy implications**

The main aim of this study was to show how gender affects the entrepreneurial performance in Democratic Republic of the Congo. Specifically, it was a question to evaluate the influence of the gender on Congolese firm performance and identify the factors of difference in firm performance between male and female entrepreneurs. Toward this end, the study is based on statistics and econometrics techniques. Hence, the results of this study contribute to the knowledge serving to well understand the gender approach in entrepreneurship in DR Congo. To measure firm performance we used the growth rate of annual sales and the growth rate of the number of employees. The results from analyses suggest that gender has an important influence on entrepreneurial performance. Indeed, Female Top Manager influences the growth of annual sales at 1% significant level. The predicted value of the growth rate of annual sales is 35.05% for female managed firms against 17.00% for male managed firms. In addition, the change in Top Manager from male to female is associated with an increase of the growth of annual sales of 34.34%. That yields a firm performance difference between female and male entrepreneurs of 18.05%. This means that female entrepreneurs are more effective in

terms of growth of annual sales than male entrepreneurs. The difference of performance is mainly due to the difference in endowments between male and female entrepreneurs for 16.29%. But, there is 16.30% not explained by the difference in entrepreneurial and managerial characteristics and can be due to the gender discrimination. Even if it's not significant, Female Top manager influences negatively the growth of the number of employees. That means that female managed firms tend to have fewer employees in comparison with male managed firms. The main characteristics which cause the difference in firm performance between male and female entrepreneurs are the access to credit, the investment and the human capital. For example, it seems that access to credit is high worthwhile for female managed firms than for male managed firms. Likewise, Female entrepreneurs draw profit from investment in land and buildings while male entrepreneurs draw profit from investment in equipment and machines. The experience of Top Manager is a factor of growth of the annual sales for male entrepreneurs while the education is the main element of human capital determining the performance for female managed firms.

Some policy implications emerge now from the findings of this study. It is clear from the results that female entrepreneurship merits a particular attention in the development of the private sector of the Congolese economy. Also, it should not be minimized the fact that there is a gender discrimination in the entrepreneurship of Democratic Republic of the Congo. Therefore, it is requisite for the government to implement a policy of equal opportunity between female and male entrepreneurs in order to develop entrepreneurship and ameliorate the business environment. So, women will be able to start and run their own business without gender constraints.

At the other hand, there is some strategic variables on which entrepreneurs can focus their attention in order to be effective. Female Managers are invited to share their experience in credit management with Male Managers. Likewise, Male Manager can share their experience in terms of human capital with Female Manager. It is opportune for female entrepreneurs to invest in human capital of their employees by the initiation of training which can compensate the lack of experience in business management.

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**Annex B: Victor Inflation Factors test**

Variable	VIF	1/VIF
age2	545.20	0.001834
age3	194.64	0.005138
age	110.48	0.009052
expert	2.39	0.417875
gender1	2.22	0.450848
gender2	1.89	0.528994
education3	1.84	0.544710
worker0	1.65	0.604363
education4	1.64	0.611430
competiv	1.62	0.615998
gender3	1.53	0.652355
gender6	1.43	0.701125
inv2	1.35	0.739767
gender5	1.34	0.746983
status	1.30	0.768887
finance1	1.23	0.810406
finance2	1.23	0.810864
social	1.23	0.813988
education1	1.21	0.827898
gender4	1.15	0.866430
inv1	1.15	0.866800
foreign	1.15	0.872531
topeduc	1.15	0.872716
lnkce_work-s	1.14	0.875726
education2	1.14	0.880083
local	1.07	0.933848
Mean VIF	33.98	

**ANNEX C: Decomposition of firm performance according to gender of Top Manager**

Blinder-Oaxaca decomposition                                      Number of obs =              210

1: female = 0  
2: female = 1

sales	Robust				[95% Conf. Interval]	
	Coef.	Std. Err.	z	P> z		
<b>Differential</b>						
Prediction_1	.1700357	.0643154	2.64	0.008	.0439798	.2960916
Prediction_2	.3505181	.2428412	1.44	0.149	-.125442	.8264781
Difference	-.1804824	.2512137	-0.72	0.472	-.6728522	.3118874
<b>Decomposition</b>						
Explained	.162947	.124507	1.31	0.191	-.0810822	.4069762
Unexplained	-.3434294	.1916586	-1.79	0.073	-.7190733	.0322145

Blinder-Oaxaca decomposition                                      Number of obs =              210

1: female = 0  
2: female = 1

workers	Robust				[95% Conf. Interval]	
	Coef.	Std. Err.	z	P> z		
<b>Differential</b>						
Prediction_1	.0418396	.0153519	2.73	0.006	.0117504	.0719289
Prediction_2	-.0135768	.039313	-0.35	0.730	-.0906289	.0634753
Difference	.0554164	.0422042	1.31	0.189	-.0273023	.1381351
<b>Decomposition</b>						
Explained	.0116389	.0272612	0.43	0.669	-.0417921	.06507
Unexplained	.0437775	.0348297	1.26	0.209	-.0244875	.1120424