Small and Medium-Sized Enterprises in Mauritius and their Owner-Managers: Does Education Matter?

Harshana Kasseeah
Department of Economics and Statistics
University of Mauritius
Mauritius.

Abstract

This paper examines the effect of the education level of owner-managers on the performance of small and medium-sized enterprises in Mauritius. It captures the effect of the level of education of owner-managers as measured by primary, secondary and tertiary education and finds that education is an important characteristic of the owner-manager which contributes positively to firm performance. Tertiary educated owner-managers contribute more to firm performance. Hence, entrepreneurs should be encouraged to improve their education levels and more highly educated individuals should be encouraged to set up firms as they are likely to have better performing firms that create more employment.

Keywords: Education, Firm Performance, Owner-manager, Small and Medium-Sized Firms

JEL Classification Code: L20, L25, L26

1. Introduction

Education has always been regarded as an important factor that influences growth. Most studies have been macro-level studies (Barro and Sala-i-Martin 2004, Hanusheck and Wessman 2008). However, education is also an important factor at the micro level. Encouraging small and medium-sized businesses and entrepreneurship in general has been put at the forefront of the economic agenda in many countries given the huge success stories that Microsoft, Apple, Google and more recently Facebook have been. The literature has found that there is a relationship between the manager-owner's education and firm performance (Van der Sluis et al, 2007). Education is indeed an important factor as the benefits include in most cases increased knowledge and increased efficiency. Education also leads to an awareness of new technology which is important for the development of industrial capabilities especially for countries of the developing world.

The aim of this paper is to investigate the relationship between owner-managers' education and firm performance using survey data on 397 small and medium-sized enterprises (SMEs) in Mauritius, a small island part of sub-saharan Africa. Major changes are being experienced in Mauritius as it moves from an economic model based on trade preferences to one based on an open competitive service platform integrated into the global economy (Moran, 2007). The Government in Mauritius is encouraging an SME culture, that is, encouraging individuals to set up their own businesses. A number of incentives have been put at the disposal of new SMEs such as the provision of diversified and specific channels for financing, the promotion of entrepreneurship, the construction of industrial estates, investment in human capacity building, and assistance for market development. However, despite this there exist some challenges to the development of SMEs in Mauritius. These challenges include access to finance, access to information and access to markets amongst others.

To understand how entrepreneurship contributes to the process of economic growth requires the decomposition of the concept (Wennekers and Thurik, 1999). We examine the effect of education on firm performance in Mauritius and also control for other relevant factors such as age and size of the firm and owner-manager's experience. We then examine the effect of education on firm performance taking into account the gender dimension, that is, whether the owner-manager is female or male. Our findings indicate that education level of owner-managers of small and medium-sized firms in Mauritius is an important determinant of firm performance.

SMEs with more highly educated owner-managers seem to perform better even after controlling for age, experience and employment level. Results obtained indicate that male owner-managers are more educated and their firms perform better than the firms of female owner-mangers who are also less well educated.

The rest of the paper is organized as follows: section 2 provides a brief literature review. Section 3 provides a background of the study. Section 4 elaborates on the empirical specification. We discuss the data and summary statistics in section 5. Section 6 presents the regression results and we conclude in section 7.

2. Literature Review

2.1 Macro-level studies

A number of studies have examined the returns to schooling, that is, education on economic growth. These studies have been conducted at a macro-level. Mincer (1974) studied individual earnings as a function of years of education and also other factors such as age and experience. His findings indicated that an extra year in education increased earnings of white male workers by around 7 per cent. A wide range of econometric studies indicate that the incomes individuals can command depend on their level of education. Psacharospoulos (1994) provides an international survey of rates of return to education over seventy-eight countries and find that the social returns decrease with the amount of education received by individuals and also that they decrease with the income the country concerned (for a survey see Stevens and Weale, 2003). Mincer (1994) reports that in analyses of school education and of job training, the evidence shows that investments in human capital respond positively to profitability, that is to changing skill differentials. Barro and Sala-i-Martin (1995) also illustrate the important link between human capital and growth.

Focusing on the UK, Sianesi and Van Reenen (2003) offer an extensive summary and a critical discussion of the empirical literature on the impact of human capital on macro-economic performance. The evidence that human capital increases productivity is compelling, though still largely divided on whether the stock of education affects the long-run level or growth rate of GDP. A one-year increase in average education is found to raise the level of output per capita by between three and six percent according to augmented neo-classical specifications, while leading to an over one percentage point faster growth according to estimates from the new-growth theories. Still, over the short-run planning horizon (four years) the empirical estimates of the change in GDP are of similar orders of magnitude in the two approaches. The impact of increases at different levels of education appear to depend on the level of a country's development, with tertiary education being the most important for growth in OECD countries. Education is found to yield additional indirect benefits to growth. More preliminary evidence seems to indicate that type, quality and efficiency of education matter for growth too.

2.2 Micro-Level Studies

Most studies on the impact of education on growth have been conducted at a macro-level. However, the literature also recognizes that it is very difficult to assess skills formation on a national basis as enrolment data tends to ignore the qualitative differences in the education provided as well as the fact that learning also occurs in companies. Lazear (2005) state that entrepreneurship requires general knowledge and formal education system normally increases this, particularly at the lower levels that are most common in developing countries. SMEs are generally started by a single entrepreneur or a small group of people and are often managed by the owner-manager. An owner-manager is different from the manager of a small business in that he/she has a personal stake in the business that is the owner-manager both owns and manages the business (Mukhtar, 2002).

Roper (1999) finds that in terms of the impact of owner-managers' characteristics on firm's strategic choices, the most consistent result in terms of sign relates to the positive but often insignificant impact of the owner-manager educational background. Years of education of the owner-manager increased the probability that a firm would adopt a number of strategic initiatives. There is a positive link between high capital requirements and the educational attainment of the owner-manager. Hence the characteristics of the owner-manager have an important effect on the firm. For instance, Van der Sluis et al (2005) perform a meta-analysis of micro-level studies with respect to the relationship between education on entry into and performance in entrepreneurship in developing countries. In developing countries an additional year of schooling raises enterprise profits by 5.5 per cent which is lower than the impact of an additional year of education on wage income than the effect in developed countries estimated to 6.1 per cent.

Kolstad and Wiig (2009) estimate the returns to schooling based on data from 3000 enterprises from Malawi using access to land to control for selection. They find that a year of additional schooling increases entrepreneurial profits by 6 per cent. However schooling is an endogenous decision and unobserved variables such as individual skills and talents might drive the results leading to biased estimates of returns to schooling. Success of entrepreneurship increases with education but this might stem from the fact that more talented individuals are both more successful and more educated. More education increases the profit-generating capabilities of the entrepreneur and thus more highly educated individuals become entrepreneurs. Hence there is a need to account for this; otherwise the returns to schooling would be overestimated. More education also increases outside opportunities and drive potentially successful entrepreneurs to other occupations where the marginal value of additional education is higher than for entrepreneurship. In that case, standard least squares estimates may underestimate the impact of education on performance.

3. Background

Mauritius is a small island economy classified as an upper middle income country with a gross national income of $7, 250 (current US$) and a literacy rate of 88 per cent in 2009. The Government provides free education to all its citizens and this includes pre-primary, primary, secondary and tertiary education. The Government in Mauritius spent around 12 per cent of its total expenditure on education in 2010, 4 per cent of GDP which was higher than the expenditure on health. The gross enrolment ratio pre-primary was 94 percent; primary enrolment was at 101 per cent, secondary gross enrolment ratio was 68 per cent, enrolment ratio for tertiary education enrolment was 43.4 per cent in 2009. The country is termed as an "African success story" and other researchers have described the growth process in Mauritius as the "Mauritian Growth Miracle" (Frankel 2010, Subramanian and Roy, 2003).

The island gained independence in 1968 when its economy was based on sugar as the main monocrop. Over the next 40 years or so the country embarked on a transformation of the economy such that the country now has several 'pillars' consisting of a well developed manufacturing and services sector. Inspired by growth successes around the world, the country embarked on an export-led growth strategy which was largely dependent on trade preferences. The industrialization strategy in Mauritius has largely been dependent on the textile and clothing sector. With the coming of foreign direct investment from Hong Kong mainly, the country saw the setting up of many textile and clothing firms. These firms employed mainly women who were largely uneducated and who were regarded as a source of cheap labour. Legislation was passed in Mauritius whereby women were paid less than men and this, encouraged firms to employ more women.

With the coming of the World Trade Organisation and the erosion of trade preferences, the country has had to compete with other countries like China, India and Bangladesh who obviously have a competitive edge over Mauritius given their endowment of cheap labour. As from the year 2000, Mauritius has experienced a large number of closures in the textile and clothing firms resulting in massive layoffs of women. Unemployment rate in Mauritius end of 2010 was at 7.8 per cent out of which around 70 percent represented women unemployment. With rising unemployment and a mismatch in skills of the unemployed and the demands of the booming sectors such as tourism and financial services, the economy experienced structural unemployment.

According to the World Bank (1994, 2002, 2004) pro-SME policy and the need for government intervention in promoting the growth of SMEs is based on three core arguments. First, SMEs enhance competition and entrepreneurship and hence have external benefits on economy-wide efficiency, innovation and aggregate productivity growth. Direct support of SMEs help countries exploit the social benefits from greater competition and entrepreneurship. Second, SMEs are more productive than large firms but they have difficulty to access finance which impedes their development. Direct Government financial support therefore can help boost economic growth and development. Third, SME expansion boosts employment more than large firms because SMEs may represent a poverty alleviation tool. In this spirit, to deal with the problem unemployment and women unemployment in particular, the Government in Mauritius encouraged a SME culture so that these unemployed people could create their own employment by setting up small and medium-sized enterprises and also create employment for others.

4. Regression Specification

To test whether the education level of owner-mangers contribute positively to firm performance among small and medium-sized enterprises in Mauritius, we augment a standard model with a variable capturing for the effect of education. Our baseline regression specification is as follows:

$LnPerformance_i = \alpha + \beta_1 LnExperience_i + \beta_2 LnAge_i + \beta_3 LnEMP_i + \beta_4 Education_i + \varepsilon_i$

where $LnPerformance_i$ captures the performance of the firm and is measured by the log of sales[1]. *LnExperience* captures the level of education of the owner manager. *Age* our next control variable captures the age of the owner-manager. *LnEMP* captures the employment level of the firm. This acts as a proxy for the size of the firm. *Education* captures for the education level of the owner manager. We use three different cut-offs, primary education *(PrimaryEduc),* secondary education *(SecondaryEduc)* and tertiary education *(TertiaryEduc)* to capture for the education level of the owner-manager. ε_i is the error term.

Laveren et al (2010) examines 511 small family firms in Belgium over the 1998-2000 period and the depth of the CEO experience at the beginning of the period of growth. The most intense period and the strongest willingness to change being situated in the beginning of tenure in a particular context and becoming less intense with the years. Begley and Boyd (1985) define managerial experience as the length of time the CEO had already been with the company. However, they find a negative relationship between CEO age and the growth of the firm. Stuart and Arbetti (1990) find that age of the CEO proxying for an experience indicator does not affect performance. Larger firms, that is, firms with higher sales also tend to employ more workers ceteris paribus. Studies have also shown that education, that is, human capital improves firm performance. Hence our hypotheses to be tested are as follows:

Hypothesis 1: There is a positive relationship between firm performance and experience of the owner-manager.
Hypothesis 2: The age of the firm is positively related to firm performance.
Hypothesis 3: Employment level is increasing in firm performance.
Hypothesis 4: Firm performance is increasing in the level of education of the owner-manager

Table 1: Description of Variables

Variable	*Description*	*Expected signs*
LnExperience	*LnExperience* captures for the number of years of experience the owner manager has.	*Positive*
LnAge	*LnAge* is the log of the age of the firm. This is calculated as 2009 minus the year of establishment of the firm. Age is expected to be positively related to firm performance.	*Positive*
LnEmp	*LnEmp* is the log of employment of firms. Firms that employ more workers tend to have higher sales and thus perform better.	*Positive*
Education	*Education* captures for the education level of the owner manager. We use three different cut-offs, primary education, secondary education and tertiary education to capture for the education level of the owner-manager.	*Positive*

5. Data and Summary Statistics

The paper uses the World Business Enterprise Survey data available from the World Bank. The database contains collected survey data on micro and small and medium sized firms across different developing and developed countries. The Enterprise Survey is answered by business owners and top managers; company accountants and human resource managers. Formal (registered) companies with 5 or more employees are targeted for interview.

[1] Unfortunately we do not have data on profit as SMEs are reluctant to reveal their profitability. Log Sales is the best available indicator of entrepreneurial success in the dataset.

The dataset consists of hundreds of business environment indicators provide critical insight into a country's economic, financial, regulatory and investment environment. Based on face-to-face surveys of business owners and top managers, the database enables researchers to discover which countries have the easiest access to finance, have the least corruption; enjoy the strongest infrastructure; have most productive workforce; or record lowest crime rates or highest female entrepreneurship. Our sample covers 398 small and medium enterprises in both the manufacturing and services sector in Mauritius in 2009. Table 2 summarises the educational achievement from the sample of SME owners in Mauritius.

Table 2: Educational Achievement of SME owners in Mauritius

	Frequency	Percent	Cumulative
No education	4	1.01	3.02
Primary school	29	7.29	10.3
Incomplete Secondary school	44	11.06	21.36
Secondary school	114	28.64	50
Vocational training	49	12.31	62.31
Some university training	39	9.8	72.11
Graduate degree (BA, BSc)	41	10.3	86.18
Masters of business administration (MBA)	49	12.31	94.72
Other post graduate degree (Ph.d, Masters)	21	5.27	100
Total	398	100	

Source: Computed

Table 2 indicates that most SME owners in our sample have completed their secondary education. Close to 50 per cent of SME owners in our sample have completed some form of secondary education ranging from vocational training to graduate training and post graduate degrees including MBAs and Master degrees. To simplify the use of the variable we drop those with no education from the sample and use three groups which are '*PrimaryEduc'*, '*SecondaryEduc'* and '*TertiaryEduc'*. The '*PrimaryEduc'* group include all the firms whose owner-managers have completed their primary education and/or have incomplete secondary school. '*SecondaryEduc'* consists of all those firms whose owner-managers have at least completed secondary school or vocational training while '*TertiaryEduc'* consists of all those firms whose owner-managers who have completed at least a degree or more. We thus generate three dummy variables to account for the three different levels of education of owner-managers.

Table 3: Correlation Matrix

	LnSales	LnExp	LnAge	LnEmp	Primary Educ	Secondary Educ	Tertiary Educ
LnSales	1						
LnExp	0.1541	1					
LnAge	0.4332	0.3105	1				
LnEmp	0.6504	0.1786	0.3116	1			
PrimaryEduc	-0.1604	0.1068	-0.0395	-0.1236	1		
SecondaryEduc	-0.2389	-0.1902	-0.0747	-0.2582	-0.3024	1	
TertiaryEduc	0.5204	0.0633	0.153	0.4096	-0.2844	-0.6503	1

Table 3 gives the correlation matrix between the independent and the dependent variables. LnSales is the log of sales of the firm and captures for the performance of the firm. LnExp is the log of experience and captures the number of years of experience the owner-manager has in the business. LnAge is the log of age of the firm while LnEmp is the log of employment. We distinguish between 3 levels of education , that is primary education (PrimaryEduc), secondary education (SecondaryEduc) and tertiary education (TertiaryEduc).

Table 3 gives the correlation matrix which demonstrates that there is a positive correlation between firm performance as measured by the log of sales and years of experience of the owner- manager. There is also a positive relationship between firm performance and the age of the firm and the level of employment of firms.

Firms that perform better tend to employ more workers as indicated by the positive coefficient of 0.650 between *LnSales* and *LnEmp*. The correlation matrix also indicates that there is a negative relationship between being the owner-manager being primary or secondary educated and firm performance; while there is a positive relation between the owner-manager being tertiary educated and firm performance.

Table 4: Summary Statistics

	Full-sample	Owner-Managers with primary Education	Owner-Managers with secondary Education	Owner-Managers with tertiary Education
	(1)	(2)	(3)	(4)
LnSales	16.299	15.469	15.759	17.549
	(1.886)	(1.076)	(1.738)	1.591
LnExperience	2.889	3.066	2.752	2.938
	(0.602)	(0.448)	(0.735)	0.477
LnAge	2.580	2.470	2.489	2.778
	(1.017)	(0.913)	(1.041)	0.942
LnEmp	3.100	2.631	2.672	3.813
	(1.373)	(1.007)	(1.228)	(1.449)
Number of Observations	137	16	56	52

Notes: Table 4 gives the summary statistics for the full sample and summary statistics for owner-managers classified according to their education level. Standard errors are reported in parentheses. Also see notes to Table 3.

Column (1) of Table 4 shows the summary statistics for the full sample. Column (2) presents the summary statistics for owner-managers with primary education. Column (3) presents the summary statistics for owner-managers with secondary education while column (4) presents the summary statistics for owner-managers with tertiary education. Owner-managers with primary education seem to have more experience but their firms are younger and they also employ less workers. On the other hand, age and employment is increasing in owner-manager's education level. Owner-managers with tertiary education have firms which are older and employ more people.

Table 5: Summary Statistics by Gender

	Male Owner Managers			Female Owner Managers		
	Primary Education	Secondary Education	Tertiary Education	Primary Education	Secondary Education	Tertiary Education
LnSales	15.265	15.948	17.736	15.919	15.191	16.521
	(1.171)	(1.548)	(1.559)	(0.739)	(2.181)	(1.441)
LnExperience	3.123	2.799	2.894	2.940	2.610	3.180
	(0.422)	(0.681)	(0.463)	(0.527)	(0.891)	(0.513)
LnAge	2.320	2.476	2.881	2.800	2.526	2.213
	(0.968)	(0.986)	(0.935)	(0.764)	(1.230)	(0.816)
LnEmp	2.500	2.687	3.967	2.922	2.627	2.964
	(0.954)	(1.080)	(1.414)	(1.171)	(1.641)	(1.432)
Number of Observations	11	42	44	5	14	8

Table 5 gives the summary statistics taking into account both gender and education level. Standard errors are reported in parentheses. Also see notes to Table 3.

Table 5 presents the summary statistics disaggregated by education level and by male and female owner-managers. We find that more highly educated male owner-managers have older firms that perform better and have been established longer and also employ more workers. Those with primary education seem to have more experience. Female owner-managers with only primary education have more experience and have older firms but those with tertiary education tend to have firms that perform better and employ more workers.

6. Regression Results

Table 6 gives the OLS and Two-Stage Least-Squares regression results. The results obtained in column (1) indicate that firm performance depends positively on firm age, employment and education level of owner-managers. The positive coefficient on LnExp indicates that experience of the owner-manager is positively related with firm performance. However the coefficient is insignificant. Firm age is positively related to firm performance as indicated by the highly significant coefficient of 0.442 on the LnFirmAge variable. Employment as measured by the LnEmp variable is also positively related to firm performance. Firms who perform better are likely to be employing more workers.

Primary, secondary and tertiary education are all important for the performance of the firm. However, the magnitude of the coefficients indicate that tertiary educated owner-managers contributed more to the performance of firms followed by owner managers with secondary education. Owner-managers with primary education also contributed positively to the performance of the firm, however their contribution is much lesser than the contribution of more highly educated owner-managers. The findings give support to the findings of Bari et al (2005) who find that human resource constraints appear binding on firm level investment and growth. As manufacturing firms expand they start to feel the lack of trained higher management and qualified technicians. A simple t-test reveals that the coefficients on the *PrimaryEduc*, *SecondaryEduc* and *TertiaryEduc* are all statistically different.

Table 6: Regression Result: Firm Performance and Owner-Managers' Education

	1	**2**	**3**	**4**	**5**	**6**
	OLS	**OLS**	**OLS**	**IVREG**	**IVREG**	**IVREG**
LnExp	0.013	-0.004	-0.001	-0.008	0.212	0.174
	(0.196)	(0.208)	(0.194)	(0.196)	(0.717)	(0.715)
LnFirmAge	0.442***	0.470***	0.454***	0.379***	0.408***	0.414***
	(0.107)	(0.114)	(0.112)	(0.127)	(0.164)	(0.164)
LnEmp	0.621***	0.627***	0.742***	0.769***	0.612***	0.614***
	(0.112)	(0.109)	(0.115)	(0.156)	(0.093)	(0.093)
PrimaryEduc	0.758***	0.776***	1.064***	0.903**	0.764***	0.763*
	(0.359)	(0.381)	(0.399)	(0.493)	(0.459)	(0.458)
SecondaryEduc	1.017***	1.011***	0.915***	1.174***	1.087*	1.074***
	(0.383)	(0.404)	(0.379)	(0.422)	(0.453)	(0.425)
TertiaryEduc	1.969***	1.950***	1.798***	1.967***	2.021***	2.011***
	(0.407)	(0.432)	(0.421)	(0.465)	(0.436)	(0.435)
Constant	11.948***	12.209***	12.098***	11.633***	11.438***	11.536***
	(0.685)	(0.810)	(0.815)	(0.698)	(1.887)	(1.881)
Region Dummies	---	yes	yes	--	--	--
Sector Dummies	---	--	yes	--	--	--
R^2	0.578	0.593	0.634	0.567	0.575	0.576
F-statistic	37.72	20.21	18.93	--	--	--
Number of Observations	137	137	137	130	137	137

Notes: Table 6 reports regression results for the full sample of firms taking into account education level of owner-managers with primary, secondary and tertiary education. Standard errors are reported in parentheses. Column 1,2 and 3 report the results for OLS while columns 4 ,5 and 6 report the 2sls results for the instrumental variable approach. LnSales is the log of sales of the firm and captures for the performance of the firm. LnExp is the log of experience and captures the number of years of experience the owner-manager has in the business. LnAge is the log of age of the firm while LnEmp is the log of employment. We distinguish between 3 levels of education, that is primary education (PrimaryEduc), secondary education (SecondaryEduc) and tertiary education (TertiaryEduc).***indicates significance at the 1% level, ** indicates significance at the 5% level, * indicates significance at the 10% level.

To test for the robustness of our results, in column (2) of Table 6 we include region dummies to control for the fact whether location in which a firm is found can have important effects on its performance. The results obtained are robust to those obtained before indicating that location does not significantly affect our results. In column (3) we include both region and sector dummies in our regression, to control for the fact that region or sector specific characteristics might drive responses of the firms. The results are once again robust. We check for the omitted variable bias in our regression and also find that the model is correctly specified based on Ramsey's reset test and does not suffer from multicollinearity. As a further test of robustness we include the squared term on both experience and age to capture for a quadratic relationship between experience and age and firm performance. The squared terms although having the correct signs are insignificant and we thus do not report the results.

The zero conditional mean assumption must hold to use linear regression. There are three cases where this assumption is violated. These include the presence of endogeneity, omitted variable bias and errors in variables (Baum, 2006). The solution to these problems is to use the instrumental variable estimator. A variable is endogenous if it is correlated with the disturbance term. Economists often model behaviour as simultaneous equation systems in which economically endogenous variables are determined by each other and some additional economically exogenous variables. The simultaneity gives rise to empirical models with variables that do not satisfy the zero conditional mean assumption.

As generally found in empirical studies, success of entrepreneurship increases with education but this might stem from the fact that more talented individuals are both more successful and more educated. Schooling is an endogenous decision and other unobservable variables such as skills and talents might drive the results leading to biased estimates (Kolstad and Wiig 2009). More education implies that owner-managers will be contributing more to their firms and have better performing firms but more educated individuals might prefer to work elsewhere rather than set up their own firms. Kolstad and Wiig (2009), control for endogeneity by using land ownership.

Columns 4, 5 and 6 of Table 6 report the 2 stage least squares estimates of the instrumental variables (IV) approach. Instrumental variables are the most widely know solution to endogenous regressors where explanatory variables are correlated with the regression error term. IV methods provide a way to obtain consistent parameter estimates. In column 4 we instrument the variable capturing employment with employment when the firm first started operations, given that firms that initially employed more workers are likely to expand faster and employ even more workers. In column 5 we use both region and sector dummies as an instrument for employment by firms. In column 6 we follow Kolstad and Wiig (2009) include access to land as an instrument. The results obtained are consistent with those obtained using OLS. We also use the size of the firm classified as small (less than 20 employees), medium (between 20 and 100 employees) and large (more than 100 employees) as instruments for the age of the firm. The results (not reported) are also consistent with those obtained previously.

Table 7: Regression Result: Firm Performance and Managers' Education
Analysis by Gender

	1	**2**	**3**
LnCEOExp	0.003	-0.022	-0.001
	(0.212)	(0.212)	(0.207)
LnFirmAge	0.438***	0.488***	0.460***
	(0.104)	(0.167)	(0.105)
LnEmp	0.609***	0.598***	0.709***
	(0.116)	(0.112)	(0.119)
PrimaryEduc	0.700***	0.739*	1.000***
	(0.373)	(0.394)	(0.401)
SecondaryEduc	1.201***	1.237***	1.121***
	(0.402)	(0.423)	(0.396)
TertiaryEduc	2.031***	2.013***	1.902***
	(0.430)	(0.449)	(0.433)
PrimaryEduc*Female	0.187	0.015	0.076
	(0.370)	(0.413)	(0.480)
SecondaryEduc*Female	-0.742*	-1.083***	-0.882***
	(0.397)	(0.371)	(0.372)
TertiaryEduc*Female	-0.311	-0.287	-0.421
	(0.546)	(0.581)	(0.615)
Constant	12.017***	11.518***	12.578***
	(0.713)	(0.832)	(0.944)
Region Dummies	---	Yes	Yes
Sector Dummies	---	---	Yes
R^2	0.592	0.615	0.651
F-statistic	30.49	22.35	20.83
Number of Observations	137	137	137

Notes: Table 7 reports OLS results. Also see Notes to Table 6. PrimaryEduc, SecondaryEduc and TertiaryEduc are interacted with a gender dummy *Female* that captures for female owner-managers. We hence generate three interaction terms: PrimaryEduc*Female, SecondaryEduc*Female and TertiaryEduc*Female which we include in our regression specification to capture for both education level and female ownership. Column 2 includes a region dummy while column 3 includes both region and sector dummies.

Verheul and Thurik (2001) focus on differences between female and male entrepreneurs with respect to their experience and education, the time they spend on running their business, networking, sector, firm size and entrepreneurial characteristics. Their findings are similar to those of Brush, 1992 as they find that male and female entrepreneurs differ with respect to experience and education. We next distinguish between male and female owner-managers education levels based on their education level in Table 7. We hence interact the dummies capturing for education level: PrimaryEduc, SecondaryEduc and TertiaryEduc with a gender dummy *Female* that captures female owner-managers. We hence generate three interaction terms: PrimaryEduc*Female, SecondaryEduc*Female and TertiaryEduc*Female which we include in our regression specification. The results obtained indicate that being female is not associated with a different effect of education on firm performance. The results are robust even when we include dummies to control for differences in location in column (2) and dummies to control for both differences in location and sector in column (3).

At first glance the results might indicate that being educated does not really matter for women entrepreneurs. However, this might suggest on the other hand that these women need a different type of education for instance entrepreneurial education or financial literacy, that answers the needs specific to women so that the education they obtain is effective in the performance of their firms. A report by UNIDO (2005) states that as long as women continue to lack social resources such as access to education they will only be able to make limited use of the financial resources they have obtained.

7. Conclusion

In this paper we investigate the effect of the education level of owner-manager on the performance of SMEs in the small island economy of Mauritius. The Mauritian economy experience major changes with the dismantling of its trade preferences. To deal with the problem of unemployment the Government has encouraged an SME culture to encourage individuals to set up their own businesses. We investigate if more educated owner-managers have a positive and significant effect on the performance of the firm controlling for the gender effect. The results obtained give support to our hypothesis. More highly educated owner-managers especially those with tertiary education contribute significantly more to the performance of their firm.

We first examine the effect of education on firm performance in Mauritius and also control for other relevant factors such as age and size of the firm and owner-manager's experience. Our findings indicate that education of the owner-manager of small and medium-sized firms in Mauritius is an important determinant of firm performance. SMEs with more highly educated owner-managers seem to perform better even after controlling for age and experience. We find that experience does not significantly affect the performance of firms. Next we also examine the effect of education on firm performance taking into account the gender dimension, that is, whether the owner-manager is female or male and the level of education. We investigate if more educated owner-managers have a positive and significant effect on the performance of the firm controlling for the gender effect.

The findings obtained suggest that tertiary educated individuals should be encouraged to set up their own firms and encourage existing owner-managers without tertiary education to go for further education. The more educated the firm owner-manager is the more the owner-manager will be able to contribute to the performance of the firm. As regards female owner-managers, the Government needs to identify their needs and how education can be provided to them so that it positively contributes to the performance of their firm.

8. References

Bari, F; Cheema, A. and Ehsan-Ul-Haque (2005) "SME Development in Pakistan: Analysing the Constraints to Growth" *Asian Development Bank*, Working Paper 3.

Barkham, R., G. Gudgin, M. Hart and E. Hanvey (1996) The Determinants of Small Firms Growth - An Inter-Regional Study in the UK: 1986-1990, London: Jessica Kingsley.

Barro, Robert and Sala-i-Martin, Xavier (2004). "Economic Growth". *The MIT Press*. Cambridge, Massachusetts. Second Edition.

Barro R. J. and X. Sala-i-Martin (1995) Economic growth, *McGraw-Hill*.

Bates, T.(1990), 'Entrepreneur Human Capital Inputs and Small Business Longevity', *Review of Economics and Statistics* 4(72), 551-559.

Baum, C. F. (2006) "An Introduction to Modern Econometrics Using Stata" Stata Press.

Beck, T, A. Demirguc-Kunt and R. Levine (2005) "SMEs, Growth, and Poverty: Cross-Country Evidence" *Journal of Economic Growth*, Springer, vol. 10(3), pp. 199-229, 09.

Begley, T.M and D.P Boyd (1985) "Company and Chief Executive Officer Characteristics Related to Financial Performance in Smaller Business" *Frontiers of Entrepreneurship Research*, Wellesley, Mass pp. 452-467.

Brush, C. G., (1992) 'Research on Women Business Owners: Past Trends, a New Perspective and Future Directions', *Entrepreneurship Theory and Practice* 17(4), 5-30.

Education Statistics (2010) Central Statistics Office, Republic of Mauritius.

Evans, D. S. and L. Leighton, (1989) 'Some Empirical Aspects of Entrepreneurship', *American Economic Review* 3(79), 519-535.

Frankel, Jeffrey A. (2010) "Mauritius: African Success Story" NBER Working Paper Series, Vol. w16569 Available at SSRN: http://ssrn.com/abstract=1723015

Hanuscheck E.A and Woessman L. (2010) "How much do Educational Outcomes matter in OECD countries?" *NBER Working Paper* 16515.

Kolstad, I and A, Wiig (2009) "Education, health and entrepreneurship" MimeoCMI – Chr. Michelsen Institute.

Laveren E., Helleboogh, D, Molly, V and A. Limere (2010) "Family Business Succession and the Impact of CEO Experience on the Growth of Small Family Firms" *International Journal of Entrepreneurship and Small Business*.

Lazear, E. P. (2005) "Entrepreneurship" *Journal of Labor Economics* 23 (4):649-680.

Mincer, J. (1994) "Investment in US Education and Training" *NBER Working Paper* Series, Working Paper 4844.

Mincer, J. (1974) "Schooling, Experience, and Earnings", New York: NBER Press.

Moran, P. (2007) "Training Needs and Human Resource Development: Analysis of SMEs in Mauritius." *Report to the Human Resource Development Council*.Republic of Mauritius

Mukhtar, S.M (2002) "Differences in Male and Female Management Characteristics: A Study of Owner-Manager Businesses" *Small Business Economics* Vol 18 (4) pp289-311.

Otani, K., (1996) 'A Human Capital Approach to Entrepreneurial Capacity', *Economica* 63, 273-289.

Psacharopoulos (1994) "Returns to Investment in Education: A Global Update." *World Development* 22(9): 1325-43.

Roper, S (1999) "Modelling Small Business Growth and Profitabilty" *Small Business Economics*, Vol 13, 3 pp 235-252.

Roper, S., (1998) 'Entrepreneurial Characteristics, Strategic Choice and Small Business Performances', *Small Business Economics* 11, 11-24.

Schiller B. R. and P. Crewson, (1997) 'Entrepreneurial Origins: a Longitudinal Inquiry', Economic Inquiry XXXV, 523-531.

Schultz, T. W., (1990) "Restoring Economic Equilibrium: Human Capital in the Modernizing Economy", *Cambridge, Mass.: Basil Blackwell*.

Sianesi, B. and J.Van Reenen, (2003) "The Returns to Education: Macroeconomics," *Journal of Economic Surveys*, Blackwell Publishing, vol. 17(2), pages 157-200, 04.

Stevens P and M. Weale (2003) "Education and Economic Growth" *International Handbook on the Economics of Education.*

Storey D. (1994) Understanding the Small Business Sector, London: Routledge.

Stuart, R. W. and P.A. Arbetti (1990) "Impact of entrepreneurial and management experience on early performance", *Journal of Business Venturing*, 5, pp. 151-162.

Subramanian Arvind, and Roy Devesh, (2003) "Who can Explain the Mauritian Miracle: Meade, Romer, Sachs, or Rodrik?" *in Rodrik, ed., In Search of Prosperity: Analytic Narratives on Economic Growth* (Princeton U. Press).

UNIDO (2005) "Improvement of the Situation of Women in Rural Areas," Report of the Secretary General.

Van der Sluis, J, M. Van Praag, and Wim Vijverberg (2005) "Entrepreneurship Selection and Performance: A Meta-Analysis of the Impact of Education in Developing Economies" *World Bank Economic Review* 19 (2):225-261

Van der Sluis, J., M. van Praag, A. van Witteloostuijn (2007) "Why are the returns to education higher for entrepreneurs than for employees" *Bonn, Institute for Labor*. IZA Discussion Paper 3058.

Verheul I. and R. Thurik (2001) "Start-up Capital: "Does Gender Matter?" Small Business Economics, Special Issue on European Approaches to Small Business Research: Papers from the XIII European Research into Entrepreneurship (RENT) Vol. 16, No. 4 pp329-345

Wennekers, S and R. Thurik (1999), "Linking Entrepreneurship and Economic Growth," *Small Business Economics*, Vol 13, pp 27-55.

World Bank. (1994). Can Intervention Work? The Role of Government in SME Success. Washington, DC: World Bank.

World Bank. (2002). Review of Small Business Activities. Washington, DC: World Bank.

World Bank. (2004). Review of Small Business Activities. Washington, DC: World Bank.