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‘Double Trouble’: the Growth of Small and Medium-Sized Enterprises in Small States

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ABSTRACT

In small economies, domestic market size constraints are expected to influence the economic growth process. This paper hypothesises that they will also influence the size and growth of firms in these economies. The paper accomplishes two main objectives. Firstly, it examines the nature of the firm size-firm growth relationship in Jamaica. It tests Gibrat’s Law – that there is no observed relationship between firm size and firm growth – using firm evidence for Jamaica, a small developing economy. Secondly, the paper investigates and identifies the major determinants of firm growth in Jamaica. The special characteristics of small economies – limited market size, prevalence of small firms and high propensity to export – suggest that the firm growth process may be influenced by factors other than firm size. The main findings from quantitative analyses of firm level data, gathered through firm questionnaires, are that sectoral classification is the main determinant of firm growth in the case of Jamaica. Financial services firms are found to grow faster than firms in the manufacturing, retail and distribution sectors. Further, small firms in Jamaica grow faster than their larger counterparts, hence a negative relationship is observed between firm size and firm growth.

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Existing theories of small economies have largely ignored the microeconomic framework of these nations and, in so doing, fail to explain the firm dynamics that underlie the observed industrial structure of small economies. The issues associated with firm performance in small economies are not new since, during the seminal forum of 1958 (Robinson, 1960), Kuznets inquired whether there are countries in this world where the size of their economies are so small that it adversely affects the performance of their producers domestically and internationally. It is widely accepted that many such small countries exist; yet researchers do not sufficiently take into account the factors influencing the performance of business enterprises in small developing economies. The purpose of this paper is to enrich the existing literature by examining the firm growth process from a small developing economy perspective.

The paper is organised in four main parts. The first part reviews the theoretical and empirical literature on firm growth and examines the major factors influencing the growth process of private firms in small economies. The second part develops an empirical framework that estimates the quantitative contribution of the major factors affecting firm growth using firm level data from Jamaica. The third part summarises the econometric results. In section four, two secondary hypotheses are tested and the final section draws some conclusions for economic policy.

I. The Theoretical Dynamics of Firm Growth

The economic phenomenon of firm growth has occupied a prominent place in economics and is expected to remain an interesting empirical area as long as private enterprises remain an important vehicle for economic growth and development. The substantial literature on firm growth is summarised both in standard textbooks and in extensive empirical surveys (Scherer & Ross, 1990; Geroski, 1994; Hart & Oulton, 1996; Sutton, 1997; Lipczynski & Wilson, 2001). Many of these empirical studies examine why firms grow, how they grow and the factors that affect firm growth. In general however, empirical studies on the firm growth process commonly starts with the relationship between firm size and firm growth, although some researchers (such as Sutton) assert that there is no obvious rationale for positing any general relationship between a firm's size and its expected growth rate (Sutton, 1997).

The Law of Proportionate Effect (LPE) represents one of the first formal attempts to model the relationship between firm size and firm growth. The LPE states that the probability of a firm growing at a given proportionate rate during any specified period of time is independent of the initial size of the firm (Singh & Whittington, 1975). Thus, if the size of the *i*th firm at time *t* is denoted by S_{it}, the LPE asserts that:

$$S_{it} \Big/ S_{i,t-1} = \varepsilon_{it} \qquad (1)$$

where: ε_{it} is a random variable distributed independently of $S_{i,t-1}$.

The empirical evidence on the relationship between firm size and firm growth is far from unanimous. An increasing number of empirical studies find evidence against Gibrat's Law; a lack of consensus in these results however, precludes its rejection. Most studies find a significant negative relationship between firm size and firm growth. A negative relationship between firm size and firm growth has been observed in the United Kingdom (Dunne & Hughes, 1994; Wilson & Morris 2000); the USA (Evans, 1987); in

India (Shanmugam & Bhaduri, 2002); and in Cote d'Ivoire (Sleuwaegen & Goedhuys, 2002). Table 1 provides a summary of other empirical works in this area and their findings.

An important extension to Gibrat's early work is Jovanovic's Learning Effect Model that includes age effects into the growth process (Jovanovic, 1982). In this model, firms learn about their efficiency over time. New firms entering the market are unaware of their true efficiencies immediately but, as they mature, they are able to uncover their productive efficiencies. During this learning process, inefficient firms are forced to exit, so allowing the efficient firms to survive and grow. Hence, young and small firms, which are in the initial process of uncovering their own efficiency levels, grow faster.

The inferences from firm growth theory and empirical research support one of three mainstream perspectives on the firm growth – firm size process:

- That firm size is independent of firm growth, that is, Gibrat's Law holds;
- That there is a positive relationship between firm size and firm growth, that is, large firms exhibit higher growth rates;
- That there is a negative relationship between firm growth and firm size.

The issue of which of the three observed relationships is evident in small developing economies is still unanswered, although orthodox economics would suggest that market size constraints in small economies will constrain the firm growth process. It is often assumed that there is a positive correlation between market size and firm growth. Several empirical studies have confirmed the importance of market demand for a firm's innovative activities and growth (Sutton 1991).

Table 1: Summary of Empirical Studies on the Firm Growth – Firm Size Relationship

Author	Country Under Study	Size Variable(s)	Sample Size	Sector(s)	Implications
Simon & Bonini (1958)	USA	No. of employees	500 firms	Manufacturing	LPE holds
Singh & Whittington (1975)	UK	Net assets	1955 firms	Manufacturing Services	Positive growth - size
Evans (1987b)	USA	No. of employees	20,000 firms	Manufacturing	Inverse growth –size
Dunne & Hughes (1994)	UK	Net assets	2149 firms	Manufacturing	Inverse growth – size
McPherson (1996)	South Africa, Lesotho, Botswana, Zimbabwe and Swaziland	No. of employees	1671 firms	Manufacturing Services	Inverse growth - size
Wilson & Morris (2000)	UK	No. of employees	427 firms	Manufacturing Services	Inverse growth - size
Shanmugan & Bhaduri (2002)	India	Sales	392 firms	Manufacturing	Inverse growth - size
Sleuwaegen & Goedhuys (2002)	Cote d'Ivoire	No. of employees Sales	183 firms	Manufacturing	Inverse growth – size
Reichstein & Dahl (2004)	Denmark	No. of employees Sales	8739 firms	Manufacturing Services	Inverse growth - size

I.1 Firm Growth in Small Developing States

In spite of attempts by a handful of studies to extend the firm growth discussion to developing economies (McPherson, 1996; Shanmugam & Bhaduri, 2002; Sleuwaegen & Goedhuys, 2002), traditional theories of firm growth generally fail to explain firm dynamics in small economies. Their main lapse results from a concentration on the firm size-firm growth relationship. In so doing, traditional theories on firm growth do not sufficiently take into account certain features of firms in small economies that affect a firm's growth path. Examples of two such variables are the sectoral classification of firms and the export behaviour of firms.

Sectoral Classification of Firms

The importance of industry classification to the firm growth process is readily understood from the small states literature. Domestic market size limitations may restrict the industrial policy choices of small states, which are further expected to precipitate industrial specialisation (Armstrong & Read, 2002). Firm performance and firm growth are expected to be strongly correlated with the firm's sectoral classification.

Export Behaviour of Firms

An exporting strategy is expected to characterise a significant proportion of firms in small economies primarily because limited domestic market demand may propel firms into seeking greater market access across borders (Baldacchino, 2005).

I.2 The Prevalence of Small Firms

If market size is a major determinant of firm size, large industrialised economies – where most of the existing studies have been concentrated – will have a strong bias towards large

entities. Alternatively, small developing economies should have a firm distribution skewed to the left because of the large number of small firms (Granovetter, 1986; Wignaraja & O'Neil, 1999). Consequently, the general application of the findings of existing studies to firms in small economies may be seriously hindered given the skewed nature of firm distribution and the long tail of small firms expected.

I.3 Transaction Costs

The vast majority of firms in small states are likely to be SMEs so that they can be expected to encounter obstacles that commonly affect small firms. These obstacles include limited access to capital, high input costs and regulatory constraints (Gauthier & Gersovitz, 1997). Small firms do not have equal access to capital markets because young and relatively unknown firms face greater liquidity constraints and higher cost of capital than more mature firms with well-known prospects (Brito & Mello, 1995). The survival of small firms is dependent upon factors other than firm size, including: age, capital intensity, ability to finance growth and the attributes of founding entrepreneurs (Behrman & Deolalikar, 1989; Nafziger & Terrell, 1996; Audretsch *et al.*,1997). The adverse effects of small size associated with small firms can be expected to be exacerbated in small economies and to further dampen the growth rates of such firms.

Given the special characteristics of small economies, the growth rates of small firms in small developing countries can be expected to be lower than those observed in industrialised countries (Sleuwaegen & Goedhuys, 2002). A prevalence of small firms, a small market size and a lack of diversification are expected to constrain the growth process of firms in small economies.

It follows therefore that, unless any observed negative relationship between size and growth is independent of domestic market size, firm distribution and the obstacles

endemic to small firms, small firms in a small economy, such as Jamaica, may not grow faster than large firms and may exhibit lower growths rates than that observed in industrialised economies. It also follows that, if a small domestic market size dampens the growth prospects of small firms, large firms may exhibit higher growth rates for reasons mentioned above.

II. An Empirical Model of Firm Growth

This empirical study specifies and tests a model that hypothesises that the growth of Jamaican firms follows a learning process that is strongly moderated by the sectoral classification, firm strategy and size of the domestic economy. This proposed hypothesis is tested against data on a heterogeneous sample of firms, composed of firms of different sectors, age cohorts, start-up sizes and export status.

Two main methods, adopted from the existing empirical works, are used to test the hypothesis. In the first model, Dunne & Hughes (1994) regress the logarithm of closing firm size on opening firm size. The second model, used by Evans (1987), regresses the annual average logarithmic growth rate of size on opening size and age for the growth period. These two multivariate analysis methods will form the basic models for testing the proposed hypothesis.

II.1 Specification of the Firm Size Model

The rationale underscoring this approach suggests that, if firm growth is independent of firm size as suggested by the LPE, then a regression of closing firm size on opening size should yield a coefficient of unity on the firm size variable, with all variations in growth rates across firms reflected in the disturbance term. To check for this, the following log linear regression equation is estimated:

$$S_t = \alpha + \beta_1 S_{t-1} + \varepsilon_t \qquad (2)$$

S_t represents the logarithm of consumer price index (CPI) deflated sales at 2002; S_{t-1} represents the logarithm of CPI deflated sales at start of the period (1997) and ε_t represents the unobserved stochastic disturbance term. If the estimated value of β_1 is less than one, then smaller firms are growing faster than larger firms. If β_1 is greater than one, the opposite is true. The null hypothesis of Gibrat's Law implies that β_1 equals to one and the LPE holds and firm size is not a predictor of firm growth.

II.2 Specification of the Firm Growth Model

With the inclusion of Jovanovic's learning effects into the growth process, the basic empirical growth model as used by Evans (1987) follows a general growth function *g* in size and age:

$$G = \frac{S_t}{S_{t-1}} = g(S_t, A_t) \qquad (3)$$

Where S_t and S_{t-1} are the size of the firm in period '*t*' and in period '*t-1*', respectively and A_t is the age of the firm in period '*t*'.

The growth model adopted in this empirical study represents an extension of the basic empirical growth model (Equation 3). This excludes variables that are expected to influence the growth rates of firms in Jamaica, following the discussion regarding the limitations of traditional firm growth models in the previous section.

In the tradition of Sleuwaegen & Goedhuys (2002), the basic growth model is extended to include key structural variables that are expected to influence the firm growth process. The Sleuwaegen & Goedhuys (2002) study of manufacturing firms in Cote d'Ivoire attempted to elucidate the growth–size relationship from a developing country's

perspective by including several institutional and environmental variables into the basic growth model. In their paper, the basic growth model is moderated through a set of structural variables, which interact with the basic function. Transforming the growth function *g* into a linear function relating growth to size and age and adding a set of structural variables leads to a regression of the form:

$$\frac{\log(S_t) - \log(S_{t-1})}{d} = \beta_0 + \beta_1 \log(S_t) + \beta_2 [\log(S_t)]^2 + \beta_3 \log(A_t) + \beta_4 [\log(A_t)]^2 + \beta_5 \log(S_t) * \log(A_t) + \Sigma \gamma_i X_i + \varepsilon_t \quad (4)$$

where *d* stands for the number of years over which growth is measured, γ represents the set of coefficient vectors and ε_t is the unobserved stochastic error term. The dependent variable represents an annual average growth rate. X_i denotes structural variables that are expected to strongly influence the growth process.

Gibrat's Law is tested by estimating the relationship between firm growth, firm size and firm age and evaluating the partial derivatives of growth with respect to age and size. $G_A = \partial \ln G / \partial \ln A$ denotes the partial derivative of the logarithmic growth rate with respect to logarithmic age and $G_S = \partial \ln G / \partial \ln S$ denotes the partial derivative of the logarithmic growth rate with respect to logarithmic size. Evans (1987) used the partial derivatives to test the assumptions and predictions of the theories of firm growth. Gibrat's Law hypothesises that $G_s = 0$ and firm size is independent of firm growth. The learning effects model implies that $G_A < 0$, that is, younger firms grow faster than older firms.

II.3 Overview of the Variables

The dependent variables for the size and growth regressions respectively are log CPI deflated sales for 1997 and the average annual logarithmic growth rate of CPI deflated sales for the period 1997–2002. As in conventional models, log firm age, squared log size

and squared log age are included in the growth regression model. Age is measured in years from the year of firm establishment to 1997, start of the growth period. The squared variables, log size (S_t^2) and log age (A_t^2), are not expected to be significant since the model has been transformed into a linear function. They are included in the growth regression for thoroughness and to maintain comparability with the existing literature.

The size class of the firm is accounted for by two binary variables indicating whether the firm is SMALL or LARGE. The number of employees is used as the measure of firm size to categorise firms into three classes (small, medium and large) and also to minimise the correlation between the size variable and the firm classification variable. SMALL denotes firms with 10 or less employees. LARGE denotes firms with over 50 employees. Medium sized firms represent the base category.

The binary variable EXPORT is also included for the firm's export status. EXPORT takes the value unity if the firm has exported in the last five years and zero otherwise. Small economies generally pursue export-led strategies because of high openness to trade and, at the micro level, firms are also expected to adopt an export strategy. The effect of exporting on the growth rate of firms is ambiguous since, although exporting provides greater market access, exporters may also encounter high transaction costs in export markets which may potentially reduce the growth advantages of exporting. The coefficient of the estimated EXPORT variable enables the appropriate relationship to be identified.

The binary variable LOCAL represents the type of firm ownership. This variable is included to account for differences in the growth performance of locally-owned firms and foreign subsidiaries. LOCAL denotes firms that are wholly-owned domestic entities. Foreign firms are defined as firms that are wholly-owned subsidiaries of foreign firms and represent the reference category.

Structural variables representing the sector to which the firm belongs are included. Two binary variables, MANU and FINSERV, account for potential differential growth rates in manufacturing and financial services industries. MANU takes the value 1 for manufacturing firms and 0 otherwise. FINSERV takes value 1 for financial service entities and 0 otherwise. Firms in other sectors represent the base category.

The capital city of Kingston represents Jamaica's largest commercial area and it is expected that firms operating there are more likely to exploit additional growth opportunities because of access to resources. Firms located in Kingston have better access to port facilities and information and communication technologies, cheaper inputs and a better transportation network. They are also more likely to engage in networking, particularly those located in industrial cluster areas. A variable LOCATION is included, which takes the value unity if a firm is located in Kingston and 0, otherwise.

The impact of information and communication technologies on the growth process is included through a binary variable, WEB, accounting for whether the firm has a website.

The basic regression models are estimated with the inclusion of structural variables and the coefficient of SIZE tested for Gibrat's Law.

II.4 The Jamaican Firm Data

The empirical analysis uses a cross-sectional dataset covering the growth of a sample of Jamaican firms. The dataset was generated primarily from fieldwork undertaken in Jamaica as part of the research process. Secondary data was compiled from the Jamaican Stock Exchange. Sixty firms are included in the dataset about which historical data on sales, employment numbers, net assets and other structural variables are available. Micro

enterprises, firms with less than five employees, were not included in the dataset. All firms are formally registered.

Description of the Data

Table 2 provides descriptive information on the sample of firms by sector, firm export status, type of ownership and firm size class. Manufacturing and financial services are used to categorise firms by sector.

Table 2: Composition of the Sample & Size of Firms by Sales, 2002 ($Jm)

	Number of Firms	Mean Size	Standard Deviation
All Firms	60	2596.95	4725.64
By Sector:			
Manufacturing	28	2360.53	4194.44
Financial Services	17	2180.32	2653.08
Other	15	3510.45	7135.90
By Export Status:			
Exporters	31	2891.24	4749.15
Non-exporters	29	2282.36	4763.64
By Ownership:			
Domestic	50	1973.93	3485.81
Foreign	8	6027.58	8142.08
Other	2	8950.00	7141.78
By Size Class:			
Small	20	112.76	131.79
Medium	20	746.09	483.82
Large	20	6931.99	6261.84

The dataset also provides information on firm size in 1997, the start of the growth period under consideration. Table 3 shows firm movement throughout the different size classes between 1997 and 2002.

Table 3: Firm Movement Through Size Classes 1997 to 2002

1997 sales Size Classes (J$m)	Number of Firms in 1997	Movement of Firms 1997 - 2002		
		< 160	***161 - 900***	***< 901***
< 160 (Small)	20	16	4	-
161 – 900 (Medium)	20	2	11	7
> 901 (Large)	20	-	-	20
Total	60	18	15	27

III. Estimation & Results

The specified empirical models are estimated with ordinary least squares. Two sets of results are presented: the size regressions and the growth regressions. The firm size regression is performed for thoroughness and to maintain comparability with other studies. For each regression model, two sets of results are presented: the basic model, which includes structural and institutional variables and the final regression model. The final model denotes the estimated regression model that shows the strongest relationship between the dependent variable and explanatory variables.

III.1 Results of Firm Size Regressions

Table 4 shows the estimated coefficients and *p* values for the size regressions. The first two columns present the results of the basic model. The last two columns present the results of the final size model.

Table 4: Regression Results for the Size Regressions - Dependent Variable Closing Size

	Basic Model		Final Model	
CONSTANT	0.797	(0.176)	0.649	(1.00)
SIZE	0.862	(0.000)	0.958***	(0.000)
$SIZE^2$	0.005	(0.814)		
AGE	-0.442	(0.167)		
AGE^2	0.065	(0.251)		
EXPORT	-0.013	(0.959)		
EXPSALES	0.139	(0.392)		
WEB	0.152	(0.475)		
LOCAL	-0.299	(0.236)		
LOCATION	0.172	(0.491)		
FINSERV	0.304	(0.248)	0.482***	(0.010)
MANU	-0.103	(0.685)		
SMALL	0.119	(0.894)		
LARGE	0.248	(.334)		
$\overline{R^2}$	.902		.905	
LM^1	0.014	(.905)	0.006	(0.939)
LM^2	0.143	(.705)	1.182	(0.277)
LM^3	0.269	(.604)	0.005	(0.941)

Notes: p-values are in parentheses. ***, ** and * denote significance at the 1, 5 and 10 per cent levels respectively. LM^1, LM^2 and LM^3 denote Lagrange Multiplier tests for serial correlation, misspecification of model and heteroscedasticity. These test statistics are not significantly different from zero.

The final size model is developed by the successive elimination of those variables whose coefficients were least significant. The basic size model is re-estimated with the SIZE variable, along with the FINSERV binary variable. The variables denoting firm size and the financial services sector are significantly different from zero. The *F*-statistic implying that jointly the coefficients are insignificant is rejected at less than the 1 per cent level of significance.

The SIZE coefficient of 0.958 is not significantly different from unity. The coefficients of the firm size variable do not support a negative relationship between opening size and closing size as observed in other empirical studies (Singh & Whittington, 1975; Dunne & Hughes, 1994). Firm size, as measured by turnover, does not appear to

strongly influence firm growth. The results of the size regressions fail to negate Gibrat's Law, suggesting that, for small economies, firm size is indeed independent of firm growth irrespective of whether the domestic market is small.

The positive and significant coefficient of the binary variable FINSERV suggests that a firm's presence in the financial services sector at the beginning of the period contributes 61.9 per cent more to its closing size, controlling for firm size.[1] A firm in the financial services sector at the start of the period is therefore more likely to increase its size throughout the period.

Although a few empirical studies have used a regression of closing size on opening size to test the firm growth – firm size relationship, such a regression is limited. By concentrating on closing size and not firm growth over a specified period, this model does not allow for a determination of the individual contributions of specific variables to the firm growth process. Alternatively, the growth regression, by separating the influence of individual variables on firm growth rate, allows for empirical testing of several secondary hypotheses.

The results of the size regression, however, indicates that opening firm size is independent of closing firm size, that is, Gibrat's Law holds.

III.2 Results of the Firm Growth Regressions

Table 5 shows the estimated coefficients and *p* values for the growth regressions. All regressions are estimated using ordinary least squares.

Sectoral and size effects seem to be at work as hypothesised *a priori.* The positive and significant coefficient of the variable FINSERV indicates that there is a significant

[1] Recall that, for dummy variables in semi-logarithmic models, the formula to obtain the relative change in mean *Y* for the dummy variable is to take the antilog of the estimated dummy coefficient and subtract one from it. Hence, the antilog of 0.482 is 1.619 and subtracting one gives 0.619 or 61.9 per cent. (Halvorsen & Palmquist, 1980; Gujarati, 1995).

association between a firm's sectoral classification and its growth rate in Jamaica. A firm's presence in the financial services sector (FINSERV) increases its growth by 10.2 per cent, holding other variables constant.

Table 5: Regression Results for Sales Growth, 1997–2003

	Basic Model		Extended Model		Final Model	
CONSTANT	0.210	(0.005)	0.158	(0.181)	-0.034	(0.074)
SIZE	-0.007	(0.796)	-0.028	(0.391)		
$SIZE^2$	0.268	(0.942)	0.001	(0.808)		
AGE	-0.136**	(0.014)	-0.089	(0.161)		
AGE^2	0.021**	(0.037)	0.013	(0.235)		
EXPORT			-0.001	(0.975)		
EXPSALES			0.025	(0.442)		
WEB			0.029	(0.500)		
LOCAL			-0.058	(0.247)		
LOCATION			0.035	(0.487)		
FINSERV			0.062	(0.237)	0.097***	(0.008)
MANU			-0.020	(0.687)		
SMALL			0.136	(0.447)	0.324***	(0.012)
LARGE			0.048	(0.348)		
$\overline{R^2}$	.086		.101		.159	
LM^1	0.337	(0.562)	0.025	(0.874)	0.015	(0.902)
LM^2	0.544	(0.461)	2.765	(0.096)	0.0000	(1.000)
LM^3	0.113	(0.992)	0.191	(0.662)	0.166	(0.683)

Notes: p-values are in parentheses. *, ** and *** denote significance at the 10, 5 and 1% levels respectively. LM^1, LM^2 and LM^3 denote Lagrange Multiplier tests for serial correlation, misspecification of model and heteroscedasticity. These test statistics are not significant with the exception of model 2 where the test for correct specification of model failed.

Additionally, being small contributes 38.3 per cent more to a firm's growth prospects. An attempt is made in subsequent sections to justify, where possible, the statistical results obtained in the final growth model from the perspective of firm growth theory and also from a small developing economy perspective.

III.3 Sectoral Classification & the Jamaican Firm

The results suggest that sector specialisation, particularly in financial services, may have important growth implications for firms in small economies. This result is consistent with several theoretical models and previous empirical findings that support the presence of a strong service sector, specifically financial services and tourism in small economies (Briguglio, 1995; Armstrong & Read, 2003). Using discriminant analysis, Armstrong & Read obtain results that indicate that the financial services sector has a positive impact on gross national product per capita. Their study also finds that the manufacturing sector has a negative impact on gross national product per capita (Armstrong & Read, 2003).

The Financial Services Sector

A few explanations may be forwarded for the positive growth rate associated with the financial services sector variable. First, a limited emphasis on attaining scale economies in the financial services sector, unlike manufacturing and agriculture, may explain the positive growth attained by Jamaican firms in this sector. It appears that small domestic market size does not adversely affect the growth performance of firms in the financial services industry. It is also possible that firm internationalisation may compensate for the adverse effects of a small domestic market. However, this explanation is undermined by the fact that over ninety-five per cent of financial services firms in the sample operate solely in the domestic market, such that the effects of internationalisation on firm growth are relatively limited.

Additionally, firm growth in the financial services sector may be driven by factors such as R&D and technology, rather than firm size. Service sectors are typically more technologically advanced, particularly with regards to investment in information and communication technologies. Technology and innovation, to the extent that they may

increase the productive efficiency of labour, may have contributed to the higher growth of financial services firms and also may have compensated for small firm size.

The Manufacturing Sector

The growth regressions also provide an opportunity to determine the contribution, or lack, of the manufacturing sector to the firm growth process in Jamaica. To test this particular hypothesis, the variable FINSERV is replaced by the MANU binary variable, denoting presence in the manufacturing sector. The resultant coefficient of MANU is negative and significant at 10 per cent level of significance. The coefficient of MANU, though not strongly significant, suggests that manufacturing firms experienced a 5.8 per cent decline in growth rates over the period.

The sectoral results indicate that a firm's presence in the financial services sector positively influenced its growth rate, however its presence in the manufacturing sector appears to inhibit its growth. These results tend to support the opinion of Briguglio (1995) and the empirical findings of Armstrong & Read (2003).

III.4 Firm Growth & Other Variables

In both the size and growth regressions, learning effects are not observed as indicated by the insignificance of the variable denoting firm age. The influence of the sectoral classification is found to outweigh the age effects on the firm growth process.

It is expected that the EXPORT binary variable, which takes the value unity when firms are exporters, would be associated with a positive coefficient, suggesting that exporters exhibit higher growth rate than firms that are not exporters. Exporters have greater market access and may attain scale economies. The EXPORT variable however, is found to be insignificant, suggesting that export status is not a good predictor of firm

growth rates. The variable EXPSALES, denoting sales from exports is also found to be insignificant.

Ownership effects, measured by the binary variable LOCAL, are not significant in the growth regressions. This is not surprising given the nature of industry classification adopted for the regressions. Foreign presence is strongest in Jamaica's mineral sector and tourism industry, sectors excluded from the sample. Ownership effects may actually affect the firm growth process, however, the sectors represented in this particular dataset did not allow for adequate testing of this hypothesis.

IV. Estimation of Secondary Hypotheses: Niche Specialisation & Small Firms

The specified growth model also allows for the testing of two secondary hypotheses. First, the influence of sectoral choices on the firm growth process may be further disaggregated at the manufacturing level to separate the effects of labour intensive and niche specialisation. It is well documented in the literature that firms that specialise in certain niche sectors may experience high growth rates in spite of being small.

Second, an attempt is made to test Gibrat's Law, that is, the relationship between firm growth and firm size using a sub sample of small and medium-sized firms. Large firms are excluded from the dataset.

IV.1 Niche Specialisation & Firm Growth

In spite of the negative association between a firm's growth and its presence in the manufacturing sector, in some instances, it is possible for small economies to sustain limited manufacturing (Baldacchino, 2005). A small economy may also specialise in a single manufacturing industry and attempt to maximise the scale economies attainable from this sector (for example, the Icelandic fishing industry). In these exceptional cases,

the manufacturing sector may not only be economically sustainable but also become a major contributor to economic growth.

To test this hypothesis, the Jamaican manufacturing sector data is disaggregated into three manufacturing sub-sectors; agro-processing, light manufacturing and industrial manufacturing. Light manufacturing includes the production of garment-related products and packaging materials. Industrial manufacturing describes the production of chemical and small electrical components.

The firm growth regression is re-estimated using the small sample of manufacturing firms. Binary variables are created for firms in the agro-processing sector (AGRO) and light manufacturing sector (LIGHTMAN). Industrial manufacturing represents the base category. The results are shown in Table 6.

Table 6: Estimated Regression for the Manufacturing Sector

	Model 1		**Model 2**	
CONSTANT	0.008	(0.903)	0.021	(0.646)
SIZE	-0.031*	(0.088)	-0.033**	(0.049)
AGRO	0.151**	(0.054)	0.147**	(0.052)
LIGHTMAN	0.019	(0.785)		
$\overline{R^2}$	.066		.10	
LM^1	1.749	(0.186)	1.835	(0.176)
LM^2	0.168	(0.682)	0.081	(0.776)
LM^3	2.487	(0.115)	1.715	(0.190)

Notes: p-values are in parentheses. ***, ** and * denote significance at the 1, 5 and 10 per cent levels respectively. LM^1, LM^2 and LM^3 denote Lagrange Multiplier tests for serial correlation, misspecification of model and heteroscedasticity. These test statistics were not significantly different from zero.

The positive and significant coefficients of the agro-processing variable indicate that firms in the agro-processing sub sector experienced positive growth over the period. The agro-processing sub-sector is an example of value added manufacturing which, when pursued, can allow firms to achieve profitability in spite of higher production costs. The agro-

processing sub-sector in small states can be seen as emerging to exploit a rich natural resource base. Agro-processing allows firms in small economies to exploit branding opportunities arising from geographic location or some other indigenous factor endowment, for example the Jamaican Blue Mountain coffee.

The element of niche specialisation and marketing possible with agro-processing may also allow firms to obtain higher prices than for standard manufactures in international markets. The key difference between standard manufacturing industries and value added manufacturing in small economies is the reliance of the former upon abundant cheap labour and the existence of preferential trade agreements for economic sustainability. Jamaica's local manufacturing sector has benefited from foreign direct investment, particularly market seeking investments, intended to exploit access to the US and EU markets available to Jamaica because of regional trade agreements. The subsequent removal and threat of removal of trade benefits has led to the demise of certain sub-sectors of the Jamaican manufacturing industry.

Jamaica's local apparel industry presents an ideal example of the failure of a small economy to enter an industry that is largely driven by scale economies and cheap labour. Limited population size often means that unit costs of production are higher in small economies (Bhaduri *et al.*, 1982; Armstrong & Read, 1998). A study comparing Jamaica's labour costs with those of its major apparel competitors notes that the cost of labour in Jamaica was US$1.80 per hour in the late 1990s compared with Mexico's US$1.08 per hour (Schrank, 2003). Of ten countries including Haiti, Nicaragua, Mexico, Guatemala, Honduras, El Salvador, Dominica Republic, Costa Rica and Colombia, Jamaica ranked ninth in terms of level of labour costs in the apparel industry. Jamaica also has the smallest population of the ten countries. Jamaican apparel firms were unable to compete on a cost basis when the benefits of trade preferential treatment were no longer available.

While a small sample size and a low adjusted R^2 limit the extent to which the results can be generalised for all small states, the econometric results indicate that if a manufacturing sector is to be pursued, firms should enter manufacturing sub-sectors that allow some element of specialisation.

IV.2 Re-Estimating the Growth Regression with Small Firms Only

Some firm growth theorists posit that the observed relationship between firm growth and firm size is dependent upon the size of firms in the sample. They state that, in sample sizes comprising mainly large firms, Gibrat's Law will be observed and firm growth will be independent of firm size. A consistent negative relationship however, is observed in samples of mainly small firms.

The Jamaican dataset includes firms from the three size categories, measured by sales or employment numbers. It is expected that, by global standards, Jamaican firms are mainly small firms although, at the local level, some firms may be regarded as large conglomerates. In spite of this, it is possible that the inclusion of large firms in the aggregate dataset may preclude an observation of a negative relationship between firm size and firm growth. The firm growth regression is therefore re-estimated using only small and medium-sized firms. The results are presented in Table 7.

The coefficient of the variable SIZE is found to be negative and significantly different from zero. A catching-up effect is apparent in this small sample of SMEs. The small value of the estimated size coefficient however, suggests that this catching-up process is slow but the results do support a negative relationship between firm size and firm growth. Additionally, *t*- tests performed on the coefficient of size do not reject the null hypothesis that the coefficient is less than zero. The results also support the popular position that, among small firms, a consistently negative and significant relationship

between firm growth and firm size is observed. The inclusion of large firms in the aggregate sample may have obscured the influence of firm size on firm growth.

Table 7: Estimated Growth Regression for SMEs

	Growth Model	
CONSTANT	-0.024	(0.649)
SIZE	-0.046***	(0.003)
FINSERV	0.141***	(0.006)
LOCATION	0.118***	(0.044)
$\overline{R^2}$	.303	
LM^1	0.475	(0.491)
LM^2	0.669	(0.413)
LM^3	1.317	(0.251)

Notes: p-values are in parentheses. ***, ** and * denote significance at the 1, 5 and 10 per cent levels respectively. LM^1, LM^2 and LM^3 denote Lagrange Multiplier tests for serial correlation, misspecification of model and heteroscedasticity. These test statistics are not significantly different from zero.

The variable FINSERV is once again found to be positive and significant, suggesting that, even among the smallest firms, a presence in the financial services sector contributes positively to a firm's growth rate. The magnitude of the contribution of financial services sector, 0.141, in this small firm sample, is greater than that observed in the aggregate sample.

The variable LOCATION is also found to be positive and significant. The decision to operate in the commercial district of Kingston generates a 12.5 per cent increase in firm growth rate. The estimated growth model provides a reasonable explanation of firm growth among SMEs as portrayed by the adjusted R^2 value of 0.30.

Small economies do not experience lower economic growth generally because of their size and the results obtained here indicate that small firms in small economies also do not experience lower growth rates because of their size. While it has been suggested that,

because of high transaction costs and size constraints, large firms in small economies may experience higher growth rates than smaller firms, the results reported here suggest otherwise. In spite of the limitations associated with a small sample size, the results suggest that small firms continue to experience higher levels of growth even in a small developing economy.

V. Firm Size and Growth in Jamaica: Summary & Conclusions

This paper modifies the basic firm growth model to best represent a small developing economy with market size constraints and investigates the firm growth process in a small economy, the case of Jamaica. The statistical and practical significance of the results are important and attempts are made to explain obtained results in light of the evidence on small economies, Jamaica's specific circumstances and the theory of firm growth.

It is often assumed that a competitive group of small firms may not emerge spontaneously in small economies because of a lack of adequate externalities and the inherent learning processes involved. Policy intervention therefore, is often required to stimulate strategic change and promote alliances between existing firms that will lead to the formation of dynamic and competitive productive and technological linkages (Ocampo, 2002). The empirical results obtained in this paper indicate that small firms in a small economy are able to experience high levels of growth. The results also indicate that the sustainability of growth in small economies is dependent upon the industrial policy adopted, specifically sectoral choices.

The strongest influence on firm growth is found to be the choice of sector. The financial services sector is found to exert a strong positive effect on the firm growth process. It follows that, within small economies, firms should be encouraged to enter those sectors that will facilitate firm growth in spite of limited economies of scale. Sectoral

specialisation is critical to economic growth in small states and the results indicate that, unsurprisingly, sectoral specialisation at the microeconomic level is also critical to firm growth. Economic growth is therefore dependent upon firm growth.

The empirical results on economic growth in small economies show that service-based economies experience higher levels of growth than commodity–producing economies. The results presented in this paper also show that financial services firms and by extension, service firms experience higher levels of firm growth than manufacturing firms, specifically those reliant on an abundance of cheap labour for their competitiveness. There is strong support for the involvement of small firms in small economies in other service sectors such as informatics, electronic commerce and tourism. It is also observed however, that niche specialisation in sectors as agro-processing may increase the growth prospects of manufacturing firms.

An investigation into the firm growth process in the case of a small economy should start with the industrial policy choices adopted in the economy rather than with firm size. The results suggest that, in small states, firm size may not be the key determinant of firm performance. Firm size is found to matter to the extent that small firms in Jamaica have been shown to exhibit high growth rates, as is observed in studies performed in developed countries. The influence of a small market size on the firm growth process however, is found to be negligible since small firms are growing.

The results presented here support the popular view that small firms are high growth performers. Given the economic vulnerability of small economies because of their small market sizes however, policy advice and support is necessary to encourage small firms to make the right product choices and thereby maintain their growth performance. This paper provides empirical support for encouraging firms in small states to enter certain specific industries – such as financial services and niche manufacturing – because of the opportunities they provide for firm growth.

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