

Small Business Survival in Guyana: Insights and Implications

Sukrishnalall Pasha
Mark D. Wenner
Elton Bollers
Dillon Clarke

Country Department Caribbean
Group

TECHNICAL
NOTE N°
(IDB-TN-1428)

Small Business Survival in Guyana: Insights and Implications

Sukrishnalall Pasha
Mark D. Wenner
Elton Bollers
Dillon Clarke

University of Guyana
Inter-American Development Bank

April 2018



Cataloging-in-Publication data provided by the
Inter-American Development Bank
Felipe Herrera Library

Cataloging-in-Publication data provided by the
Inter-American Development Bank
Felipe Herrera Library

Small business survival in Guyana: insights and implications / Sukrishnalall Pasha, Mark D.
Wenner, Elton Bollers, Dillon Clarke.

p. cm. — (IDB Technical Note ; 1428)

Includes bibliographic references.

1. Small business-Guyana-Management. 2. Small business-Guyana-Finance. 3. Credit-Guyana. I.
Pasha, Sukrishnalall. II. Wenner, Mark D. III. Bollers, Elton. IV. Clarke, Dillon. V. Inter-American
Development Bank. Country Department Caribbean Group. VI. Series.

IDB-TN-1428

<http://www.iadb.org>

Copyright © 2018 Inter-American Development Bank. This work is licensed under a Creative Commons IGO 3.0 Attribution-NonCommercial-NoDerivatives (CC-IGO BY-NC-ND 3.0 IGO) license (<http://creativecommons.org/licenses/by-nc-nd/3.0/igo/legalcode>) and may be reproduced with attribution to the IDB and for any non-commercial purpose. No derivative work is allowed.

Any dispute related to the use of the works of the IDB that cannot be settled amicably shall be submitted to arbitration pursuant to the UNCITRAL rules. The use of the IDB's name for any purpose other than for attribution, and the use of IDB's logo shall be subject to a separate written license agreement between the IDB and the user and is not authorized as part of this CC-IGO license.

Note that link provided above includes additional terms and conditions of the license.

The opinions expressed in this publication are those of the authors and do not necessarily reflect the views of the Inter-American Development Bank, its Board of Directors, or the countries they represent.



CET@IADB.ORG

Abstract

Most businesses in Guyana are small and medium-scale enterprises (SMEs). SMEs are assumed to generate a significant share of employment and contribute to wealth creation. However, they operate in a less than auspicious business climate, and their failure rate is high. One of the perennial complaints of small business operators is lack of access to credit. Two of the reasons that financial intermediaries are reluctant to grant credit to SMEs are the perceived higher risk of failure and lack of adequate collateral. This study sought to identify the factors responsible for SMEs' survival in Guyana using data collected from a country-wide survey which captured the profile of 380 SMEs and their founders. The Kaplan-Meier (KM) estimator and Cox Proportional Hazard Model (CPHM) were employed to calculate survivability of the SMEs based on firm characteristics and founder's profile. Gender, location, and economic activity consistently explained the survival of these businesses. However, factors such as the age, experience, and educational background of the owner, as well as, the source of start-up funding, access to government procurement, legal form, and business strategy were found not to be significant determinants of SMEs' survivability. Further, the significance of size as an essential determinant was inconclusive. Based on the estimates derived from our survival function, a prototypical credit risk calculator was developed to illustrate how a model can be constructed with non-financial data to quantify the risk of firm failure. The model could be further refined and used by practitioners to better screen prospective SME loan applicants and reduce some of the imperfect information barriers.

JEL classification codes: L22, O16, O17

Keywords: small business survival rates, Cox Proportional Hazard Model (CPHM), Guyana, credit risk in SMEs, risk calculator, Kaplan-Meier (KM) estimator

ABBREVIATION AND ACRONYMS

AEDP	Agricultural Export Diversification Project
BOS	Bureau of Statistics
GAPA	Guyana Agricultural Producers Association
GACPA	Guyana Arts and Craft Producer Association
GMA	Guyana Manufacturing Association
GOG	Government of Guyana
GOINVEST	Guyana Office for Investment
GPL	Guyana Power and Light
GSBA	Guyana Small Business Association
GTA	Guyana Tourism Authority
GWI	Guyana Water Incorporated
IPED	Institute of Private Enterprise Development
LEN	Linden Enterprise Network
MOA	Ministry of Agriculture
MOC	Ministry of Communities
MOIP	Ministry of Indigenous People
MOSP	Ministry of Social Protection
MSED	Micro and Small Enterprises Development Project
NAAG	National Aquaculture Association of Guyana
NGMC	New Guyana Marketing Corporation
NIS	National Insurance Scheme
PSC	Private Sector Commission
READ	Rural Enterprises and Agricultural Development project
SBB	Small Business Bureau
SBC	Small Business Council
SBDF	Small Business Development Fund
SBDFT	Small Business Development Finance Trust
SMEs	Small and medium-scale enterprises
THAG	Tourism and Hospitality Association of Guyana
WOW	Women of Worth

Table of Contents

1.0 Introduction.....	4
1.1 Background	4
2.0 Literature Review and Hypotheses	5
2.1 Owner’s Profile and SME Survival Rate	6
2.2 Characteristics of SMEs and Survival Rate	7
3.0 Econometric Procedure and Data collection methodology	8
3.2 Data Collection Methodology	10
3.2.1 Sample Frame Development and Sampling Method.....	11
3.2.2 Questionnaire	12
3.2.3 Field Execution and Data Issues.....	12
4.0 Discussion of Results and Key Findings	16
4.1 Factors the Respondents Attributed to Success and Failure of SMEs	16
4.1 Survival Analysis: Kaplan-Meier Estimator.....	17
4.3 Survival Analysis: Cox Proportional Hazard Model.....	22
Source: Survey data.....	27
6.0 Conclusion and Recommendations	27
References	30
Appendix 1: Questionnaire	33
Appendix 2: Agencies Contacted	39

List of Tables

Table 1: Definition of Variables	10
Table 2: Sample Allocation by Administrative Regions	11
Table 3: Distribution of Respondents Based on Firm Features.....	14
Table 4: Distribution of Respondents Based on Firm Features cont'd (<i>percentage</i>).....	15
Table 5: Distribution of Respondents Based on Owner’s Profile at the Time the Business was Established.....	15
Table 6: Distribution of SMEs Based on Business Strategies and Access to Government Procurement	16
Table 7: Status of Business	16
Table 8: Reasons for Failure	17
Table 9: Reasons for Success.....	17
Table 10: Survival Duration of SMEs Based on the Owner’s Profile	18
Table 11: Survival Duration of SMEs Based on Firm-specific Features	21
Table 12: Survival Duration of SMEs Based on Other Firm-specific Features.....	22
Table 13: Firm Survival Based on Founder’s Profile.....	22
Table 14: Firm Survival Based on Firm-specific Factors	23
Table 15: Firm Survival Based on Founder’s Profile and Firm Profile	24
Table 16: Loading Factors.....	25
Table 17: Information Related to Owners and Companies at the Time They were Established .	26
Table 18: Risk Calculator	27

List of Figures

Figure 1: Survival Function.....	18
----------------------------------	----

1.0 Introduction

1.1 Background

It is widely believed that small and medium-scale enterprises¹ (SMEs) have significant economic and social impacts in both developed and developing countries. According to the World Bank (2015), SMEs contribute up to 45 percent of total employment and account for approximately 33 percent of gross domestic product (GDP) in emerging economies. While SMEs play an equally important role in Guyana, they are stymied by several perennial challenges. For example, as McGarrell (2009) reports, SMEs are constrained by limited access to financing, the high cost of borrowing, and inadequate advisory services, business training, and management capacity. The most formidable challenge is access to affordable financing. This appears to be a universal problem: a recent World Bank study points out that approximately 200 to 245 million formal and informal enterprises do not have access to loans or overdraft protection and that micro, small, and medium-sized enterprises (MSMEs) account for more than 90 percent of them. Consequently, many small enterprises simply stagnate and languish without credit (World Bank, 2015).

In his study, McGarrell (2009) argues that the historically high failure rate of SMEs explains the aversion of lending institutions to provide financial support to these firms. According to the U.S. Bureau of Labor Statistics, approximately one-third of U.S. firms survive more than ten years, and 50 percent survive to five years. The statistics are similar for other Organization for Economic Cooperation and Development (OECD) countries. For emerging and developing countries, statistics are less readily available and normally depend on administrative data that capture only formally registered firms. These are the minority of firms; the majority are informal and unregistered. Studies that rely on surveys are not repeated with sufficient frequency to understand survival over time. Also, many micro and small enterprises are characterized as a last resort, or 'survivalist' activities, for those who cannot obtain formal employment. The consensus in the literature, however, is that micro and small businesses, in general, face much higher barriers to growth than those found in developed countries, which adversely affects productivity and survival. One rigorous study in Cote d'Ivoire over the period of 1977 to 1997 found that on average formally registered firms survive 6.6 years. (Klapper and Richmond, 2009).

In Guyana, SMEs did not receive any policy attention until 2004, when the Government of Guyana (GOG) enacted the Small Business Act No. 2 of 2004 (hereafter, the Act). This legislation essentially created the legal and regulatory framework for promoting the growth and development of the SME sector in Guyana. Specifically, the Act created the Small Business Council (SBC), the Small Business Bureau (SBB), and the Small Business Development Fund (SBDF). The Act also provides a legal guarantee that allows SMEs to benefit from at least 20 percent of all government procurement. The Act defines a small business as a firm with fewer than 25 employees.

¹ MSMEs are defined differently across countries. They are normally characterized based on three elements: (1) number of employees, (2) gross revenues or turnover, and (3) value of assets. The most commonly accepted comparative benchmark is number of employees, since there are fewer differences across jurisdictions. Medium-sized enterprises tend to have an upper limit of 200 employees in most developing countries, whereas the United States, China, and the European Union have higher limits; small enterprises typically have 10-50 employees and microenterprises have fewer than 10, and in some countries fewer than five. Source: OECD Statistical Portal Glossary of Statistical Terms. Available at <https://stats.oecd.org/glossary/detail.asp?ID=3123>

Commercial banks in Guyana do not normally lend to small businesses due to the inability of many SMEs to meet collateral requirements and the lack of formal financial statements. The degree of financial depth (private sector credit/GDP) in the country is shallow, at 30 percent in 2017. For the sake of comparison, many advanced economies have ratios higher than 100 percent. In Guyana, only a handful of nonbank institutions cater to SMEs, but they are capital-constrained and have limited outreach. For example, the Institute for Private Enterprise Development (IPED), the leading microfinance lender in Guyana, had approximately 5,742 active borrowers in 2014.²

Over the last two decades, the GOG has designed and implemented several credit programs targeting various categories of SMEs. The most notable among them include: the Women of Worth (WOW) project, the Micro and Small Enterprises Development (MSED) project, Agricultural Export Diversification (AED) project, and Rural Enterprises and Agricultural Development Project (READ). Notwithstanding these efforts by the GOG, SMEs are still constrained by limited access to financing. The number of credit beneficiaries of these government programs tends to be small. For example, the WOW program, which operated from 2010 to 2015, had 1,326 loan clients.³

This study was undertaken primarily to determine whether the unique features of SMEs and/or the profile of their founders motivated their survival. It utilized a random sample of 380 SMEs from the 10 administrative regions in Guyana, the Cox Proportional Hazard Model (CHPM), and the Kaplan-Meier (KM) estimator. The study also proposed a prototypical credit risk calculator using an approach similar to Kuwahara et al. (2015).

The contributions of the study are many. To the authors' knowledge there is a paucity of research on SMEs' survival in Guyana and the Caribbean. It would, therefore, expand the extant literature. It also departs from previous studies by using primary data collected from a countrywide survey that covers various sectors. Researchers who are constrained by the dearth of secondary data on SMEs may find the data collection methodology insightful for conducting similar research in the future. Finally, the prototypical risk calculator proposed may be refined and used by financial intermediaries to screen prospective loans SME loan applicants and therefore reduce the imperfect information barriers caused by the fact that SMEs do not maintain financial and other records of their operations.

The remainder of the study is structured as follows. Section 2 reviews the literature and states the hypotheses that tested herein. Section 3 describes the sampling strategy, survey instruments, data collection methods, survey instrument, and econometric techniques used. Section 4 presents the key results and findings. Section 5 proposes a risk calculator. Section 6 concludes and offers policy recommendations.

2.0 Literature Review and Hypotheses

The literature on business survival is vast and covers various countries, industries, and firms (micro, small, medium, and large). It also employs an extensive range of statistical and

² Source: IPED 2014 Annual Report Available at http://www.ipedgy.com/reports/IPED_Annual_Report_2014.pdf This is the most recent annual report available.

³ Source: Ministry of Social Protection website. Available at http://www.mlhss.gov.gy/index.php?option=com_content&view=article&id=659:wow-programme-positively-impacting-single-mothers&catid=2:news&Itemid=45

econometric tools and data (primary and secondary) to identify the factors responsible for the survivability of businesses. Consequently, several theses have emerged in the literature to explain firm survival. Notwithstanding the range of factors, the literature has grouped them into two broad categories, namely, firm-specific characteristics and owner/founder profiles (DeTienne and Wennberg, 2013). This section evaluates the literature and sets out the hypotheses in our study.

2.1 Owner's Profile and SME Survival Rate

Abundant empirical evidence suggests that the survival of SMEs is contingent on the profile of their founders (DeTienne and Wennberg, 2013). This is understandable due to the omnipresence of the owners of these organizations (McCartan-Quinn and Carson, 2003). Many researchers have observed that SMEs survive longer when they are founded and managed by investors who are more educated, diligent (Duchesneau and Gartner, 1990; Hand, Sineath III, and Howle, 1987; and McCartan-Quinn and Carson, 2003), innovative, creative, and competent (Chaganti and Chaganti, 1983), display greater risk tolerance (Stevenson and Gumpert, 1985), and possess relevant experience (Beckman and Marks, 1996; Duchesneau and Gartner, 1990). The gender and ethnicity of the owners were also found to be important determinants of SMEs' survival (Boden and Nucci, 2000; Brush, 1992; Cooper, Dunkleberg, and Woo, 1989). Boden and Nucci (2000), for example, reported that the survival rate is higher for men-owned than for women-owned companies.

Among other things, an entrepreneur's gender, age, educational attainment, and professional experience have impacts on SMEs' survival and post-entry performance (Cao 2012). Numerous studies support the pertinence of proper management for the success of small businesses (Amit and Schoemaker 1993; Arditi, Koksal, and Kale 2000; Mellahi and Wilkinson 2004). Ramis (2002) found that the importance of management training for proprietors increases when the company has higher growth potential. Similarly, Inkoun (2003) found that SMEs' performance is closely linked to the entrepreneurial skills of the proprietor. This study found that proprietors with business-related qualifications are 30 percent more likely to survive than non-qualified proprietors.

Vivarelli (2004) corroborated the finding, noting that a founder's profile does not influence the decision to start a new firm; however, it influences post-entry performance. Wu and Wang (2007) posited that the higher the education level of the entrepreneur, the higher the firm survival rates would be. This study also added that gender has a major influence on firm survival; men-owned SMEs have higher survival rates than those owned by women. Koush (2008) argues that basic management skills are important regardless of the nature of the business that the SME undertakes, and the lack of such skills will result in suboptimal decisions and eventual collapse. Jo and Lee (1996) argue that the founder's level of education is related to the firm's profitability. Mengistae (2006) found that the founder's years of schooling are positively related to new a new firm's survival and growth. Batjargal (2005) found that industry experience has a positive impact on a firm's revenue growth. Prior experience in the same industry was cited as having a positive impact on growth, while prior experience in other industries did not. In this study, the following hypotheses were tested to evaluate the impact of owner characteristics on SME survival:

Hypothesis 1: SMEs with owners who are more skilled (human capital) enjoy a higher probability of survival.

Hypothesis 2: SMEs with owners who possess more pertinent experience enjoy higher survival rates.

Hypothesis 3: SMEs owned and managed by men enjoy higher survivability than those owned and managed by women.

In the context of Guyana, Hypothesis 3 is considered important given the deliberate efforts by the GOG to assist women to establish and sustain micro and small enterprises locally. The GOG developed the WOW initiative specifically to provide single-parent mothers with concessional loan financing to initiate and sustain their businesses.

2.2 Characteristics of SMEs and Survival Rate

Several firm-specific variables have been consistently identified as important determinants of SMEs' survival. For example, Bates and Nucci (1989) showed that large SMEs enjoy a higher probability of survival than their smaller counterparts. This literature describes this phenomenon as the "liability of smallness" thesis (Strotmann, 2007). Another crucial factor is the age of the business. Boyle and Desai (1991) revealed that an SME's survival is low at start-up but improves over time, a phenomenon known as the "liability of newness" thesis. From an organizational theory perspective, Stinchcombe (1965) found evidence that a firm's dissolution risk reduces as it advances in age, consistent with the liability of newness hypothesis. The principal explanation posited to support this thesis is that firms gradually adapt to the environment and develop a trust-based relationship with other firms as they age, which in turn causes older firms to enjoy higher survival rates than the new ones (Carroll and Hannan, 2000; Nelson and Winter, 1982).

Brüderl and Schüssler (1990), Fichman and Levinthal (1991) and Mahmood (2000) later improved the liability of newness hypothesis, proposing that SME dissolution risk follows an inverted U shape called the "liability of adolescence" hypothesis. The explanation is that survival is low at start-up and remains extremely low during the first and second years, but it increases over time as the firm adapts to the environment. Adding to the literature, among other things, Baum (1989) and Hannan (1998) raised the "liability of senescence" hypothesis. They posited that older firms, which are more rigid, are unable to respond to changes when compared with their younger counterparts. Therefore, a firm's dissolution risk rises after reaching a certain age.

Other critical firm-specific factors that impact SMEs' survival include the location of the business (Chawla, Pullig, and Alexander, 1997; Ryan and Power, 2012) and the financial structure of firms (O'Neill and Duker, 1986). Lopez-Garcia and Puente (2006) show that debt improves the survivability of firms up to a threshold point. Firms which operate beyond the threshold suffer from lower survivability. Additionally, many studies show that firms' dissolution risk reduces as their size increases. These studies argue that small firms suffer from scale disadvantages and financial constraints.

In this study, the liability of smallness thesis and the liability of newness thesis are evaluated by testing the following hypotheses:

Hypothesis 4: Larger SMEs enjoy a higher probability of survival compared to their smaller counterparts.

As noted earlier, local SMEs are eligible to benefit from at least 20 percent of all government procurement once they comply with the requirements of the Small Business Act. This financial incentive is intended to incubate these businesses. The literature suggests that the growth and survival of SMEs are positively influenced by government support in Vietnam (Hansen et al. 2009). Additionally, Li et al. (2005) found that state-owned firms are more likely to survive than non-state-owned firms because they have easier access to government aid. Our study tests the following hypothesis to determine whether the economic concession enhances the survival of SMEs:

Hypothesis 5: SMEs that successfully obtain government procurement contracts are more likely to survive.

3.0 Econometric Procedure and Data collection methodology

3.1 Econometric Procedure

The study employs the KM estimator and the CPHM to ascertain the factors which contributed to the survival of SMEs. It is noteworthy that these statistical techniques are used extensively in the literature to examine both business survival and the demise of SMEs (see, for instance, Abouzeedan and Busler, 2004; Segarra and Callejon, 2002).

The KM (1958) estimator is a non-parametric (or product-limit) approach to survival and hazard function estimation that effectively captures the empirical distribution of the covariate(s). When used in conjunction with the Logrank (Mantel-Cox) test, Gehan (or Breslow or Generalized Wilcoxon) tests and Tarone-Ware test, possible homogeneity in the observations may be distilled from the KM estimator. Since the three statistical tests emphasize different aspects of the survival and hazard functions, it is not uncommon for researchers to employ them simultaneously.⁴

The CPHM, on the other hand, is a semi-parametric model that is a useful tool for identifying factors that exert significant influences on survival. Unlike other probabilistic models, the CPHM provides estimates that capture the average survival time (β_j) and the likelihood that average survival time (e^{β_i}) would increase/decline with changes in the covariate X_i . The statistical significance of these estimates is tested using the z-statistic, Wald test and confidence interval (Machin, Cheung, and Parmar, 2006). The z-statistics follow the standard normal distribution while the Wald test follows the χ^2 distribution with $g - 1$ degrees of freedom and is computed as follows (Machin, Cheung, and Parmar, 2006):

In this study, three specific models are estimated. The first examines the impact of owner's profile on firm survival. The second investigates the relationship between survivability and the profile of the firm. The third combines the variables from the first two models.

⁴ The Gehan (or Breslow or Generalized Wilcoxon) tests emphasize events occurring during the early segment of the survival curve, while the Logrank test and Tarone-Ware test place heavy emphasis on events occurring at the tail and middle of the survival curves, respectively.

$$\text{Model 1: } \log[\lambda(t; X_i)] = \log[\lambda_0(t)] + \beta_1 \text{EDU} + \beta_2 \text{EXP} + \beta_3 \text{GEN} + \beta_4 \text{AGE} \quad \text{Equation (1)}$$

$$\text{Model 2: } \log[\lambda(t; X_i)] = \log[\lambda_0(t)] + \beta_1 \text{LOC} + \beta_2 \text{SIZE} + \beta_3 \text{ECN} + \beta_4 \text{LF} + \beta_5 \text{GP} + \beta_6 \text{REG} + \beta_7 \text{FIN} \quad \text{Equation (2)}$$

$$\text{Model 3: } \log[\lambda(t; X_i)] = \log[\lambda_0(t)] + \beta_1 \text{LOC} + \beta_2 \text{SIZE} + \beta_3 \text{ECN} + \beta_4 \text{LF} + \beta_5 \text{GP} + \beta_6 \text{REG} + \beta_7 \text{FIN} + \beta_8 \text{EDU} + \beta_9 \text{EXP} + \beta_{10} \text{GEN} + \beta_{11} \text{AGE} \quad \text{Equation (3)}$$

Where: $\log[\lambda_0(t)]$ denotes the average number of years an SME survives and educational level of owner (EDU), years of relevant industry experience possessed by owner (EXP), sex of owner (GEN), legal form of the business (LF), location of the business (LOC), and size of the business measured by gross revenue or number of employees (GS) and economic sector (ECN), whether the business benefits from government procurement (GP), whether the business is properly registered (REG), and source of financing (FIN).. The estimated coefficients are expected to be significantly different from zero. The dependent variable captured the length of time an SME was or is in existence and whether it is active or nonoperational. The definitions of the variables are provided in Table 1. The overall significance of the model was evaluated with the Wald test and Likelihood ratio (LR) test. Both tests offer similar results but are influenced by the types of variables used and the sample size.

The failure of small businesses has been defined variously as the exit of the firm from the industry (Henderson, 1999), insolvency or bankruptcy of the firm (Zacharakis, Meyer, and DeCastro, 1999), losses to creditors (Lussier, 1995), and the inability of firms to earn expected returns and achieve the objectives set by stakeholders (Friedland and Morris, 1976 and Jennings and Beaver, 1995), among others. In this study, we utilized the definition by Henderson (1999) since it is much easier to establish the dissolution and exit of an SME from the industry than it is to prove insolvency (or bankruptcy), suboptimal expected returns, and losses to creditors because of the lack of financial data for these firms.

Table 1: Definition of Variables

Variables	Definition	Codes
EDU	The highest completed level of education	1 (Primary), 2 (Secondary), 3 (Tertiary), 4 (Vocational), and 5 (Other)
EXP	Industry experience of founder, measured by the number of years associated with the industry.	1 (< 5 years), 2 (6 - 10 years), 3 (11 - 15 years), 4 (16 - 20 years), 5 (> 20 years)
GEN	The gender of the founders	1 (male), 0 (female)
LOC	The location of the firm	Administrative region where the SME is domiciled Regions 1 thru 10
SIZE1	The size of the firm, measured by the number of persons employed	1: (1 - 3 employees), 2 (4 – 6 employees), 3 (7 – 9 employees), 4 (9 – 12 employees), 5 (12 employees)
SIZE2	The size of the firm based on its gross annual sales	1 (<\$20 million), 2 (G\$20 - G\$40 million), 3 (G\$40-G\$59 million) [Exchange rate G\$206.50=US\$1]
GP	Whether the SME benefits from government procurement	1 (SME benefit from government procurement), 0 (otherwise)
LF1	The legal form of the business	1 if the firm is a sole proprietorship, 0 otherwise.
LF2		1 if the firm is partnership, 0 otherwise
LF3		1 if the business is a limited liability company, 0 otherwise
LF4		1 if other applies, 0 otherwise
REG1	Business registered with GRA	1 if the business is registered with GRA, 0 otherwise
REG2	Business registered with NIS	1 if the business is registered with NIS, 0 otherwise
REG3	Business registered with Deeds Registry	1 if the business is registered with Deeds Registry, 0 otherwise
FIN1	Start-up funds: own funds	1 if the business owner utilized own funds to start up the business, 0 otherwise
FIN2	Start-up funds: commercial banks	1 if the business owner had access credit from commercial banks to start the business, 0 otherwise
FIN3	Start-up funds: IPED/SBDF	1 if the business owner had access to credit from IPED/SBDF to start up the business, 0 otherwise
FIN4	Start-up funds: SBB	1 if the business had access to credit from SBB to start up the business, 0 otherwise
FIN5	Start-up funds: family/friends	1 if the business had access to credit/financial support from family/friends to start up the business, 0 otherwise
Time	The length of time the SME was or is in existence	Actual values
Censor	The status of the firm	1 (SME is dead or failed), and 0 (SME is alive or survived).

3.2 Data Collection Methodology

The study utilized a survey which targeted SMEs across Guyana. Based on Section 2 Subsection 1(f) of the Small Business Act No. 2 of 2004, a small business is defined as any business which satisfies at least two of the following conditions: it does not employ more than 25 persons, generate more than \$60 million in gross revenue (US\$290,556 at the 2015 exchange rate equivalent), or have total assets of less than \$20 million. The sample frame development, sampling method, survey instrument (questionnaire), and field execution are explained below.

3.2.1 Sample Frame Development and Sampling Method

Given the dearth of data on the size and profile of the small business sector, the overall sample size was pragmatically established for the size effect using data collected from various agencies including: the Tourism Hospitality Association; the Guyana Office for Investment (Go-Invest); the Guyana Tourism Authority (GTA); the Guyana Arts and Craft Association (GACA); the Ministry of Agriculture (MoA); the Guyana Geology and Mines Commission (GGMC); the Deeds Registry; the Private Sector Commission (NIS); the chambers of commerce; the Guyana Manufacturing Association (GMA); Guyana Power and Light (GPL); the Small Business Bureau (SBB) and Guyana Water Incorporated (GWI). These agencies collect and retain information on businesses across every sector and administrative region in Guyana. A significant number of businesses were found on more than one list since they interacted with multiple agencies simultaneously. For example, numerous businesses which were registered with the Deeds Registry, Go-Invest, and the SBB were also on the lists provided by GPL and GWI. This is understandable since every business requires electricity and water to operate. The duplicate entries identified were eliminated. After the elimination exercise, the sample frame amounted to 40,000 businesses, comprising farmers (rice, sugar, cash crop, etc.), agro-processors, exporters, manufacturing companies, miners, loggers, jewelers, small shops, market stalls, and others. Based on the sample frame, a sample size of 380 was deemed adequate since it produces a 95 percent confidence level and incurs a sampling error of 5 percent. To account for the likelihood that some of the businesses selected may be difficult to contact or when located refuse to participate in the survey, the authors enlarged the initial sample by 10 percent to 418 businesses.

A representative sample was derived using a multistage stratified random sampling methodology. This decision was motivated by the fact that stratification offers numerous benefits. First, the sampling error associated with stratification is lower when compared to random sampling without stratification. Second, stratification ensures inclusion of all strata of interest. Finally, this methodology permits the analysis of each stratum. For this study, the population was stratified by administrative region. The strata were then weighted by population size. Finally, the businesses were selected randomly within the strata to derive a representative sample. The sample allocation across the various administrative regions is shown in Table 2.

Table 2: Sample Allocation by Administrative Regions

Administrative Regions	Minimum sample	Maximum sample
Region 1: Barima – Waini	11	12
Region 2: Pomeroon – Supenaam	24	26
Region 3: Essequibo Islands - West Demerara	49	54
Region 4: Demerara – Mahaica	187	206
Region 5: Mahaica – Berbice	25	28
Region 6: East Berbice - Corentyne	33	36
Region 7: Cuyuni – Mazaruni	15	17
Region 8: Potaro - Siparuni	2	2
Region 9: Upper Takutu – Upper Essequibo	8	9
Region 10: Upper Demerara – Berbice	26	29
Total	380	418

Source: Authors' calculations.

3.2.2 Questionnaire

A questionnaire was designed to collect the requisite data to test the hypotheses proposed in the study. The questionnaire was divided into five sections (see Appendix 1). The first section sought to determine whether the business should be interviewed based on its gross annual revenue and staff complement. A business is considered eligible once it satisfies two criteria. It should not employ more than 25 employees or generate more than \$60 million annually in gross revenue. According to the Small Business Act No. 2 of 2004, these conditions must be satisfied for a business to be regarded as a small business. The information on firm size was used to test the hypothesis 4, which postulates that large SMEs enjoy a higher probability of survival than their smaller counterparts.

The second section of the questionnaire captured the profile of the business owner at the time the business was formed. Specifically, it attempted to determine the age, educational background, relevant industry experience, and gender of the business owner. This information is required to test hypotheses 1, 2, and 3.

The third section sought to determine the age of the business, its status, and its economic classification. In this survey, business activities are classified into five key sectors, namely, agriculture (farming: rice, sugar, cash crop, livestock), fishing (aquaculture, commercial fishing), mining (gold, diamond, sand, stone), services (construction, wholesale, retail, transportation, storage, information/communication, health service, real estate, other services), and manufacturing. This section also attempted to determine whether the SME accesses government contracts and is registered with the Guyana Revenue Authority (GRA), the National Insurance Scheme (NIS), and the Deeds Registry. The data collected from this section of the questionnaire were used to test hypothesis 5.

The fourth section attempted to identify the factor(s) that the business owner considers extremely important for their success or failure. The primary aim of collecting this data was to ascertain whether the econometric results support the perception of business success or failure.

The last section focused on a wide range of issues, such as the source(s) of funding to start up the business, the legal form of the business (sole proprietorship, partnership, limited liability company, or another), and the strategy pursued by the business (cost leadership strategy, where the business produces and sells a product already available in the market but at a lower price, or product differentiation strategy, where the business offers a unique product/service to the market).

3.2.3 Field Execution and Data Issues

The data were collected via face-to-face and telephone interviews conducted between December 9 and 18, 2015. For this exercise, a structured questionnaire was administered. The survey instrument was pre-tested on December 7, 2015, on SMEs in Regions 3 and 4 with the aim of determining: (i) the clarity of the questions, (ii) respondents' comfort with the questions, and (iii) the average duration of an interview. During the pilot test, many respondents displayed some level of discomfort with the question regarding their earnings. This question had to be retained, however, since the gross annual income of the respondents is important for ensuring their

suitability. Telephone and face-to-face interviews were conducted to ascertain the effectiveness of each approach.

A total of 439 SMEs participated in the survey. Table 3 shows the distribution of the respondents across the 10 administrative regions of Guyana. The majority of respondents, constituting 49.2 percent, were in Region 4, followed by Regions 3 (12.9 percent), 6 (8.7 percent), 10 (6.8 percent), and 2 (6.3 percent). The businesses operating in these regions accounted for approximately 83.9 percent of sample data (see Table 3).

All the respondents employed fewer than 25 employees and earned less than G\$60 million in gross sales. Thus, they conformed with the legal definition of a small business in the Act. Approximately 92.1 percent of the respondents employed fewer than five employees, while 94.8 percent earned less than \$60 million annually as gross revenue (see Table 3). It is noteworthy that approximately 3.9 percent of the respondents indicated that they don't know their annual income, and 1.4 percent were reluctant to answer the question related to their earnings (see Table 3).

Table 3: Distribution of Respondents Based on Firm Features

Administrative regions	Frequency	Valid percent
Region 1: Barima-Waini	11	2.9
Region 2: Pomeroon-Supenaam	24	6.3
Region 3: Essequibo Island-West Demerara	49	12.9
Region 4: Demerara-Mahaica	187	49.2
Region 5: Mahaica-Berbice	25	6.6
Region 6: East Berbice-Corentyne	33	8.7
Region 7: Cuyuni-Mazaruni	15	3.9
Region 8: Potaro-Siparuni	2	0.5
Region 9: Upper Takutu-Upper Essequibo	8	2.1
Region 10: Upper Demerara-Berbice	26	6.8
Number of employees		
1 - 5 employees	350	92.1
6 - 10 employees	16	4.2
11 - 15 employees	4	1.1
20 - 25 employees	3	.8
> 25 employees	5	1.3
Don't know	1	.3
No answer	1	.3
Annual gross revenue		
<\$20 million	323	85.0
\$20 - \$40 million	33	8.7
\$40 - \$59 million	4	1.1
Don't know	15	3.9
No answer	5	1.1
Years operational		
0 -10 years	206	54.2
11 – 20	112	29.5
21 – 30 years	35	9.2
31 – 40 years	19	5.0
41 – 50 years	7	1.8
No answer	1	0.3
Economic sectors		
Agriculture	189	49.7
Fishing	8	2.1
Forestry	1	.3
Mining/Quarrying	7	1.8
Manufacturing	24	6.3
Services	149	39.2
No Answer	2	.5
Sole proprietorship	315	83.1
Partnership	58	15.3
Limited liability company	2	.5
Other	4	1.1

Source: Survey data.

The majority of respondents (83.7 percent) indicated that they were in operation for less than 20 years; of which 54.2 percent were operational for less than 10 years (see Table 3). Approximately 49.7 percent of the SMEs were involved in agricultural activities (farming: rice, sugar, cash crop, livestock), while 39.2 percent were engaged in services activities (construction, wholesale, retail, transportation, storage, information/communication, health services, real estate, and other services) (see Table 3). According to Table 3, the remaining respondents were engaged in fishing (2.1 percent), forestry (0.3 percent), mining and quarrying (1.8 percent), and manufacturing activities (6.3 percent).

Table 4 shows that the vast majority of respondents were not formally registered with the NIS, the GRA and the Deeds Registry. Table 4 suggests that more than 60 percent of the businesses were not registered with NIS, GRA, and Deeds Registry. Only 23.9 percent of the respondents were registered with NIS, while 32.9 percent and 25.8 percent were registered with the GRA and the

Deeds Registry, respectively. It follows, therefore, that most of the businesses were part of the informal economy.

Based on Table 4, approximately 84.2 percent of the respondents suggested that they utilized own funds to start up their businesses, while 20.0 percent depended on family and friends (see Table 4). Less than 10 percent of the respondents obtained funds from formal financial institutions or the government, commercial banks (8.2 percent), IPED/SBDF (5.5 percent), or the Small Business Bureau (1.6 percent).

Table 4: Distribution of Respondents Based on Firm Features cont'd (percentage)

Formally Registered with:	Yes	No	No Answer
National Insurance Scheme (NIS)	23.9	68.9	7.1
Guyana Revenue Authority (GRA)	32.9	63.9	3.2
Deeds Registry	25.8	66.6	7.6
Source of Start-Up Funds			
Own funds	84.2	15.3	0.5
Commercial banks	8.2	91.6	0.2
IPED/SBDF	5.5	94.2	0.3
Small Business Bureau (SBB)	1.6	98.2	0.2
Family/friends	20.0	79.7	0.3

Source: Survey data.

Table 5 shows that most of the businesses were owned and managed by men. Specifically, 259 respondents (68.2 percent) were men. Approximately 54.7 percent of the business owners possessed less than five years of relevant industry experience at the time the business was established (see Table 5). Another 25 percent of the respondents had between six and 10 years of relevant industry experience (see Table 5). Only 3.9 percent of the businesses were owned and managed by persons with more than 20 years' experience (see Table 5).

Table 5: Distribution of Respondents Based on Owner's Profile at the Time the Business was Established

Sex	Frequency	Valid percent
Male	121	31.8
Female	259	68.2
Experience		
<5 years	208	54.7
6 - 10 years	95	25.0
11 - 15 years	26	6.8
16 - 20 years	21	5.5
>20 years	15	3.9
Don't know	10	2.6
No answer	5	1.3
Educational background		
Primary	101	26.6
Secondary	203	53.4
Technical/vocational	39	10.3
University	33	8.7
Don't know	1	.3
No answer	3	.8
Age of owner		
<20 years	81	21.3
20 - 25 years	116	30.5
26 - 30 years	64	16.8
31 - 35 years	47	12.4
>35 years	65	17.1
Don't know	4	1.1
No answer	3	.8

Source: Survey data.

A total of 101 respondents (26.6 percent) had completed primary school, while 203 respondents (53.4 percent) and 39 respondents (10.3 percent) had completed secondary school and technical/vocational training, respectively (see Table 5). Only 8.7 percent had benefited from university-level education (see Table 5). More than 50 percent of the respondents were under 25 years old at the time they established their businesses. Indeed, 21.3 percent of the respondents were under 20 years old, and 30.5 percent of the respondents were between 20 and 25 years old (see Table 5).

The respondents were asked about their business strategy. Based on Table 6, approximately 63.2 percent of the respondents suggested that they employed a price leadership business strategy, while 34.5 percent of the respondents indicated that they applied production differentiation. A mere 7.9 percent of the respondents benefitted from government procurement (see Table 6).

Table 6: Distribution of SMEs Based on Business Strategies and Access to Government Procurement

Business strategy	Frequency	Valid percent
Price leadership	240	63.3
Product differentiation	131	34.6
Both	5	1.3
No answer	3	0.8
Yes	30	7.9
No	345	90.8
No answer	5	1.3

Source: Survey data.

4.0 Discussion of Results and Key Findings

4.1 Factors the Respondents Attributed to Success and Failure of SMEs

According to Table 7, approximately 76.6 percent of the businesses interviewed were operational while 23.4 percent of the businesses had failed (closed and exited the industry). More than 70 percent of the businesses had failed during the past five years, with the largest number of closures occurring in 2015.

Table 7: Status of Business

Status	Frequency	Valid percent
Non-operational	89	23.4
Operational	291	76.6
Total	380	100.0

Source: Survey data.

Limited access to finance, inadequate markets, poor location, and other factors were cited as the most important factors responsible for the closure of the SMEs. Our survey data revealed that 41.6 percent of the failed SMEs believed that inadequate access to finance had contributed to their demise. A considerable number of respondents also identified limited markets (18.0 percent), poor location (11.2 percent), and other factors (19.1 percent) as responsible for their failure (see Table 8).

Table 8: Reasons for Failure

Factors	Frequency	Percent
Limited markets	16	18.0
Limited finance	37	41.6
Poor networking	2	2.2
Smallness of firm	2	2.2
Lack of experience	2	2.2
Poor location	10	11.2
Non-diversified portfolio	2	2.2
Other	17	19.1
Don't know	1	1.1
Missing value	2	
	89	100.0

Source: Survey data.

A significant number of businesses that survived attributed their success to market access (18.2 percent), social capital or networking (16.2 percent), industry experience (19.9 percent), ideal location (12.0 percent), years in operation (10.0 percent), access to finance (6.2 percent), and other factors (8.2 percent) (see Table 9). Less than 5 percent of the SMEs indicated that they were successful because of firm size (0.3 percent), educational background of the business owner (2.4 percent), or a diversified portfolio (3.8 percent) (see Table 9).

Table 9: Reasons for Success

Factors	Frequency	Percent
Access to markets	53	18.2
Access to finance	18	6.2
Networking	47	16.2
Firm size	1	0.3
Experience	58	19.9
Location	35	12.0
Years in the business	29	10.0
Educational background	7	2.4
Diversified portfolio	11	3.8
Other factor	24	8.2
Don't know	5	1.7
No answer	3	1.0
	291	100.0

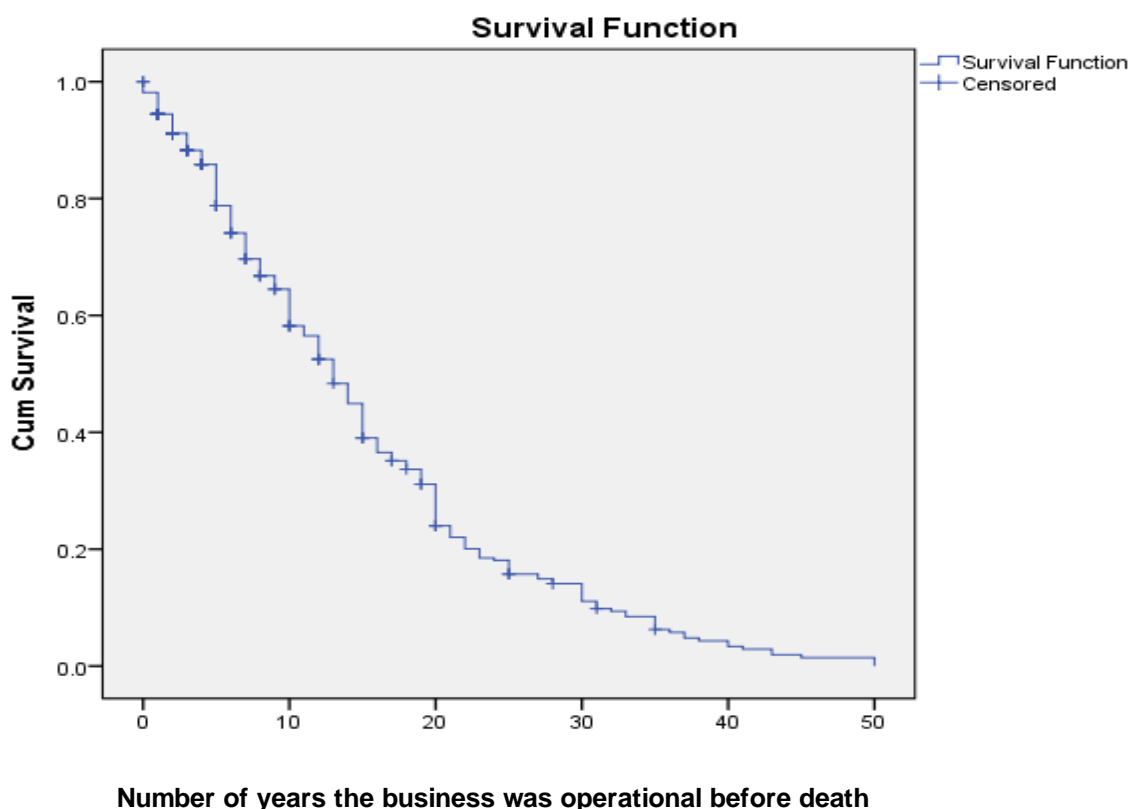
Source: Survey data.

4.1 Survival Analysis: Kaplan-Meier Estimator

The KM estimator is a potent tool for performing survival analysis and a precursor to the more sophisticated CPHM. It is particularly useful for determining whether survivability is influenced by the unique feature of each observation (Agarwal, 1998). It also provides the empirical distribution of the observations without imposing any restriction (Agarwal, 1998). The KM estimates may be reported in graphical form (survival curve) or tabular form (survival table). The study reports the results using survival graphs.

The mean survival time of SMEs was approximately 15.2 years. Figure 1 shows the survival curve starts at 1 (or 100 percent) and declines continuously over time. The exit of SMEs was relatively high during the first 10 years, where more than half of the businesses (approximately 59 percent) were closed. After that, the rate of exit was more gradual (Figure 1). Roughly 61 percent of the SMEs were closed within 15 years, 75 percent in 20 years, and 84.2 percent within 25 years. The mean survival duration of the firms was 15.3 years while the median was 13 years.

Figure 1: Survival Function



Source: Survey data.

The KM estimates generated for the grouped data are evaluated using the three (3) test statistics described in the previous section. The KM estimates generated for the two subgroups based on the gender of the owners are presented in Table 10: Panel A. According to this table, the mean survival time of men-owned SMEs was 15.3 years compared with 14.9 years for women-owned SMEs. The test statistics suggest that the disparity between the two subgroups was significantly different at the 1 percent level of significance (Log Rank $p=0.000$, Breslow $p = 0.000$, Tarone-Ware $p = 0.000$). It therefore follows that gender influenced the survivability of SMEs.

Table 10: Survival Duration of SMEs Based on the Owner’s Profile

	Avg. Life Years	Chi-Square and p-value among group for the difference in survival		
Panel A: Sex		Log Rank Test	Breslow Test	Tarone-Ware Test
Male	15.3	57.3	40.5	47.4
Female	14.9	(0.000)*	(0.000)*	(0.000)*
Panel B: Experience				
<5 years	14.0	4.9	5.9	5.6
6 - 10 years	15.2	(0.294)	(0.206)	(0.233)
11 - 15 years	13.8			
16 - 20 years	22.4			
>20 years	21.1			
Panel C: Educational background				
Primary	18.9	1.8	1.2	1.3
Secondary	14.9	(0.614)	(0.764)	(0.728)
Technical/vocational	11.2			
University	14.6			
Panel D: Age				
<20 years	17.9	5.8	5.4	5.7
20 - 25 years	14.9	(0.212)	(0.251)	(0.226)
26 - 30 years	16.7			
31 - 35 years	15.3			
>35 years	10.5			

The KM estimates generated subgroups based on the age, educational background, and industry experience of the founders, shown in Table 10. The highest survival duration was associated with firms owned by persons with 16-20 years' experience and those with more than 20 years' experience (Table 10: Panel B). The lowest survival durations were associated with SMEs owned by persons with 11-15 years' experience followed by those with less than five years of relevant industry experience. The test statistics in Table 10: Panel B, however, indicate that the KM estimates were not significantly different at the 1 percent, 5 percent, and 10 percent levels of significance (Log Rank $p=0.294$, Breslow $p = 0.206$, Tarone-Ware $p = 0.233$). This means that the experience of their founders did not influence the survival of SMEs.

Table 10: Panel C shows the survival of SMEs for the five subgroups based on the educational background of the owners. The firms founded by persons with primary education exhibited the highest survival time, followed by those founded by persons with secondary education and university-level training. The lowest survival time was recorded for founders with technical/vocational education. However, the three test statistics suggest that the differences in the survival curves were not statistically significant at the 1 percent, 5 percent, or 10 percent levels of significance (Log Rank $p=0.614$, Breslow $p = 0.764$, Tarone-Ware $p = 0.728$). In other words, there were no significant differences in survival rates of SMEs based on the educational background of their owners.

The SMEs were also grouped according to location, size, economic activity, legal form, type (registered or unregistered), and sources of start-up funds. The KM estimates were then evaluated to glean the impact of these firm-specific factors on the survival of SMEs.

The results revealed that the survival rates for SMEs varied based on location. The test statistics confirmed that the differences between the KM estimates were significant at the 1 percent and 5 percent levels of significance (see Table 11: Panel A). The highest survival duration was recorded for SMEs in Region 5 (23.7 years), followed by Region 1 (19.6 years) and Region 7 (18.3 years). Meanwhile, the lowest survival duration was recorded for Region 10 (12.9 years), Region 3 (13 years), and Region 6 (13.5 years).

The survivability of firms based on size (measured by the number of employees) was not statistically significant at the 1 percent, 5 percent, or 10 percent levels of significance, as shown in Panel C and Panel B of Table 11. There were mixed results, however, regarding the significant differences among SMEs based on their gross revenue.

Table 11: Panel D shows that the survival pattern for SMEs varied according to their economic activities. SMEs operating in the fishing sector (21.3 years) and the agriculture sector (16.8 years) survived the longest while those in the forestry (10.0 years) and manufacturing (11.6 years) sectors registered the lowest average survival durations. The test statistics confirmed that the differences between the curves are not superficial but significant at the 1 percent level of significance (see Table 11: Panel D).

There were no significant differences in survival rates of SMEs based on legal form (see Table 10: Panel E). However, the SMEs that were formally registered with the Deeds Registry, NIS, and

GRA reported lower survival duration than the companies that were not registered. The survival duration of firms registered with GRA, NIS, and Deeds Registry were 12.7 years, 13.6 years and 12.4, years respectively. Meanwhile, the survival duration for SMEs not registered were 17.1 years (NIS), 16.6 years (GRA) and 17 years (Deeds Registry). These preliminary results could be interpreted to mean that the SMEs that operated in the informal sector outlived those in the formal sector (see Table 11: Panel F). The differences among the survival rates of SMEs based on the sources of start-up funding were not statistically significant (see Table 11: Panel H).

Table 11: Survival Duration of SMEs Based on Firm-specific Features

		Avg. life years	Chi-Square and p-value among group for the difference in survival		
Panel A: Administrative regions			Log Rank Test	Breslow Test	Tarone-Ware Test
	Region 1	19.6	18.986	21.818	20.341
	Region 2	14.6	(0.025)**	(0.009)*	(0.016)**
	Region 3	13.0			
	Region 4	14.6			
	Region 5	23.7			
	Region 6	13.5			
	Region 7	18.3			
	Region 8	17.0			
	Region 9	17.1			
	Region 10	12.9			
Panel B: Number of employees					
	1 - 5 employees	15.0	1.896	.955	1.344
	6 - 10 employees	18.2	(0.755)	(0.917)	(0.854)
	11 - 15 employees	18.6			
	20 - 25 employees	10.0			
	> 25 employees	28.0			
Panel C: Annual gross revenue					
	<G\$20 million	15.2	2.800	4.817	3.990
	G\$20 - G\$40 million	14.3	(0.247)	(0.090)***	(0.136)
	G\$40 - G\$59 million	17.3			
Panel D: Economic sectors					
	Agriculture	16.8	28.197	23.785	26.162
	Fishing	21.3	(0.000)*	(0.000)*	(0.000)*
	Forestry	10.0			
	Mining/quarrying	13.5			
	Manufacturing	11.6			
	Services	13.5			
Panel E: Legal form					
	Sole proprietorship	15.1	5.810	3.307	3.681
	Partnership	13.6	(0.121)	(0.347)	(0.298)
	Limited Liability	6.0			
	Other	20.5			
Panel F: Registered with:					
GRA:	Yes	12.7	13.599	16.227	15.348
	No	17.1	(0.000)*	(0.000)*	(0.000)*
NIS:	Yes	13.6	12.420	12.821	13.009
	No	16.6	(0.000)*	(0.000)*	(0.000)*
DR:	Yes	12.4	11.470	12.757	12.501
	No	17.0	(0.001)*	(0.000)*	(0.000)*
Panel H: Start-Up Funds					
Own funds:	Yes	15.2	.088	.371	.234
	No	13.5	(0.767)	(0.542)	(0.628)
Commercial Banks:	Yes	18.9	1.802	3.594	2.838
	No	14.9	(0.179)	(0.058)**	(0.092)**
IPED/SBDF:	Yes	12.5	.127	.413	.275
	No	15.4	(0.722)	(0.521)	(0.600)
SBB:	Yes	13.1	.119	.260	.183
	No	15.3	(0.730)	(0.610)	(0.669)
Family/Friends:	Yes	13.8	1.750	1.888	1.829
	No	15.6	(0.186)	(0.169)	(0.176)

The KM estimates for SMEs that benefitted from government procurement were not significantly different from those without access to this type of government support (see Table 12: Panel B). We also found that the kind of business strategy employed by SMEs was not an important determinant of their survival (see Table 12: Panel: A).

Table 12: Survival Duration of SMEs Based on Other Firm-specific Features

Panel A: Business strategy	Avg. Life Years	Chi-Square and p-value among group for the difference in survival		
		Log Rank Test	Breslow Test	Tarone-Ware Test
Price leadership	16.4	.065	1.541	.875
Product differentiation	13.3	(0.968)	(0.463)	(0.646)
Both	13.6			
Panel B: Gov't procurement				
Yes	12.1	2.216	2.503	2.390
No	15.7	(0.137)	(0.114)	(0.122)

4.3 Survival Analysis: Cox Proportional Hazard Model

The foregoing results suggest that gender, as well as certain features of the SMEs, were significant determinants of survivability. To determine more conclusively the factor(s) which influenced the survival of SMEs, the CHPM was estimated with variables that capture the profile of the owners and features of the firms. Three separate models were estimated. Model 1 linked the survival of SMEs to the profile of business owners (or demographic factors). Model 2 examined the impact of firm features on their survival. The last model combined both demographic and firm-specific factors.

Table 13 provides the results of model 1. These results suggest that gender exerted a significant impact on the survival of SMEs. The hazard rate (β_j) and hazard ratio associated with gender (GEN) were 1.328 and 3.772, respectively, indicating that women-owned firms registered lower survival rates when compared to men-owned firms. This finding is consistent with previous studies, such as Boden and Nucci (2000), which found lower survival duration for women-owned firms. The hazard ratio of 3.772 suggests that businesses owned by women are more than three times more likely to fail than those owned by men. The other variables in model 1 were not significant determinants of survival. Table 13 shows that estimated coefficients for age (AGE), educational background of owners (EDU), and owner's industry experience (EXP) were not significantly different from zero at the 1 percent, 5 percent, and 10 percent levels of significance.

Table 13: Firm Survival Based on Founder's Profile

$$\log[\lambda(t; X_i)] = \log[\lambda_0(t)] + \beta_1 AGE + \beta_2 EXP + \beta_3 EDU + \beta_4 GEN$$

Where: $\log[\lambda_0(t)]$ is the average number of years an SME survives based on the owner's age (AGE), industry experience (EXP), educational background (EDU), and gender (GEN), which represent the covariates that cause the survival time to either improve or decline over time. In the model the dependent variable is the length of time the SME remains operational and whether the firm is operational or non-operational.

	B	SE	Wald	df	Sig.	Exp(B)
GEN	1.328	.229	33.657	1	.000	3.772
AGE	.115	.087	1.739	1	.187	1.122
EXP	-.175	.108	2.627	1	.105	.839
EDU	.065	.128	.259	1	.611	1.067
LR test	831.8				(0.000)*	

Table 14 shows the results for model 2. Based on these results, several firm-specific variables exerted a significant influence on the survivability of SMEs. The estimated coefficient for Region

7 was significantly different from zero ($\beta_j = 1.313$, $e^{\beta_j} = 3.719$, $p = 0.088$), suggesting that SMEs operating in this region are more likely to fail when compared to those located in other administrative regions of Guyana. This finding confirms the importance of location with respect to firm survival, as previously found by studies such as Chawla, Pullig, and Alexander (1997) and Ryan and Power (2012).

The SMEs registered with the Deeds Registry also displayed significantly lower survivability. **Table 14** shows that the hazard rate (β_j) and hazard ratio (e^{β_j}) of the SMEs registered with the Deeds Registry were negative (0.924 and 2.520, respectively) and significantly different from zero at the 10 percent level of significance ($p = 0.069$).

Table 14: Firm Survival Based on Firm-specific Factors

$$\log[\lambda(t; X_i)] = \log[\lambda_0(t)] + \beta_1 LOC + \beta_2 SIZE + \beta_3 ECN + \beta_4 LF + \beta_5 GP + \beta_6 REG + \beta_7 FIN$$

Where: $\log[\lambda_0(t)]$ is the average number of years an SME would survive and location (LOC), size (SIZE), economic sector (ECN), legal form (LF), business strategy (BS), government procurement (GP), degree of formality (REG), and sources of start-up funding (FIN) represent the covariates which either enhance or reduce the average survival time. In the model, the dependent variable is the length of time the SME remains operational.

	B	SE	Wald	df	Sig.	Exp(B)
LOC			11.678	9	.232	
Region 1	-.406	.953	.182	1	.670	.666
Region 2	.669	.719	.864	1	.353	1.951
Region 3	.761	.859	.784	1	.376	2.140
Region 4	.404	.628	.413	1	.520	1.498
Region 5	-.848	.931	.829	1	.362	.428
Region 6	-.285	.809	.124	1	.724	.752
Region 7	1.313	.771	2.901	1	.088	3.719
Region 8	.415	1.183	.123	1	.726	1.514
Region 9	-.342	.990	.119	1	.730	.711
ECN			35.865	6	.000	
Agriculture	1.604	.754	4.524	1	.033	4.973
Fishing	-1.493	.314	22.586	1	.000	.225
Forestry	-.431	.630	.469	1	.493	.650
Mining/quarrying	2.177	1.127	3.732	1	.053	8.823
Manufacturing	.639	.734	.759	1	.384	1.895
Services	-.452	.468	.934	1	.334	.636
GP	.571	.661	.748	1	.387	1.770
REG: GRA	.010	.574	.000	1	.986	1.010
REG: NIS	.693	.503	1.897	1	.168	1.999
REG: Deeds Registry	.924	.508	3.312	1	.069	2.520
FIN1: Own	.070	.492	.020	1	.887	1.072
FIN2: Commercial banks	-.437	.647	.457	1	.499	.646
FIN3: IPED/SBDF	-.260	.725	.129	1	.720	.771
FIN4: SBB	.253	1.053	.058	1	.810	1.288
FIN5: Family/Friend	.350	.423	.685	1	.408	1.419
LF			3.481	3	.323	
Sole proprietorship	-1.105	1.297	.725	1	.394	.331
Partnership	-1.038	1.320	.618	1	.432	.354
Limited liability	1.001	1.688	.351	1	.553	2.720
BS			.631	2	.730	
Price leadership	.539	1.062	.258	1	.612	1.714
Differentiation	.325	1.064	.093	1	.760	1.384
Size	.130	.511	.065	1	.799	1.139
LR Test	768.3				(0.000)*	

Source: Survey Data.

Our results confirmed that SMEs which operated in the agriculture and manufacturing sectors reported lower survivability as evidenced by the statistically significant hazard ratios of ($e\beta_i$) 4.973 ($p = 0.033$) and 8.823 ($p = 0.053$), respectively. The businesses that operated in the fishing sector reported a significantly lower hazard ratio of 0.225 ($p = 0.000$).

Contrary to the KM estimates, the estimated coefficients of the other variables in model 2 were not significantly different from zero. It therefore follows that factors such as access to government procurement, the source of start-up funding, legal form, business strategy, and size were not important determinants of firm survival.

The firm-specific variables were combined with the profiles of the business owners and the insignificant variables eliminated by applying the general-to-specific approach to identify the significant determinants of SMEs survival. Table 15 provides the estimated hazard ratios for the final model.

Table 15: Firm Survival Based on Founder’s Profile and Firm Profile

$$\log[\lambda(t; X_i)] = \log[\lambda_0(t)] + \beta_1 LOC + \beta_2 ECN + \beta_3 GEN$$

Where: $\log[\lambda_0(t)]$ is the average number of years an SME would survive based on location (LOC), size (SIZE), and gender (GEN), which represent the covariates that cause the survival time to either improve or decline over time. All the variables are expected to exert a positive impact on firm survival. In the model, the dependent variable is the length of time the SME remains operational.

	B	SE	Wald	df	Sig.	Exp(B)
GEN	1.103	.248	19.784	1	.000	3.014
LOC			12.277	9	.198	
Region 1	.909	.881	1.064	1	.302	2.481
Region 2	.955	.807	1.403	1	.236	2.600
Region 3	1.153	.822	1.967	1	.161	3.169
Region 4	.954	.732	1.701	1	.192	2.597
Region 5	-.364	1.248	.085	1	.771	.695
Region 6	-.412	.909	.206	1	.650	.662
Region 7	1.581	.808	3.828	1	.050	4.859
Region 8	1.749	1.252	1.951	1	.162	5.749
Region 9	.569	1.017	.314	1	.576	1.767
ECN			14.302	6	.026	
Agriculture	1.479	.738	4.019	1	.045	4.387
Fishing	-.836	.292	8.204	1	.004	.433
Forestry	-.056	.540	.011	1	.917	.945
Mining/quarrying	1.154	1.082	1.138	1	.286	3.172
Manufacturing	-.234	.714	.108	1	.743	.791
Services	-.401	.444	.813	1	.367	.670
REG: NIS	1.092	.393	7.722	1	.005	2.980
SIZE	.314	.178	3.089	1	.079	1.368
LR Test	843.5				(0.000)	

Source: Survey data.

The significant variables from model 1 and model 2 remained significant in the parsimonious model. The results in Table 15 suggest that the survival rate was lower for SMEs owned by women ($\beta_j = 1.103$, $e\beta_i = 3.014$, $p = 0.000$), operated in Region 7 ($\beta_j = 1.581$, $e\beta_i = 4.859$, $p = 0.050$), registered with NIS ($\beta_j = 1.092$, $e\beta_i = 2.980$, $p = 0.005$) and involved in agricultural activities ($\beta_j = 1.479$, $e\beta_i = 4.387$, $p = 0.045$). However, the SMEs that were involved in fishing activities

registered significantly higher survivability ($\beta_j = -0.836$, $e\beta_i = 1.579$, $p = 0.045$). We conjecture that fishing businesses survive longer since the owners of these businesses have limited ability to pursue alternative economic activities. As such, the owners of these businesses are more inclined to struggle to keep their businesses open since exit is not necessarily a viable option. In our final model, the estimated coefficients of size were significantly different from zero.

Risk Calculator

A prototypical risk calculator was developed by following the procedure in Kuwahara et al. (2015). Specifically, we combined the estimated coefficients from the CHPM with profiles of the firm and owner to derive a weighted average value (z-score) as shown in the equation below.

$$Z = \beta_1 X_1 + \beta_2 X_2$$

Where: Z represents the composite score for a company, X_1 represents a vector with characteristics of the business owner, X_2 represents the vector with the profile of the business, and β_1 and β_2 represent the factor loading or estimated coefficients from the CHPM model. Where the coefficient is not statistically significant, a weight of zero is used, suggesting it does not impact on the survivability of the company. However, when the coefficient is statistically significant, the estimated coefficient is utilized. It is noteworthy that the only difference between our proposed calculator and Kuwahara et al. (2015) is that we have replaced financial indicators with the weights associated with the profiles of the SMEs and their owners. We believe this may be an appropriate solution in countries with a paucity of financial information.

Once the z-score was obtained for a company, it is then inputted into the probability of default (PD) equation below:

$$PD = \frac{1}{1 + \exp(-Z)}$$

The PD ranges from 0 (no exit or failure) to 1 (100 percent chance of exit or failure).

Illustration: To derive the loading factors a model is estimated with all our variables. The results are presented in Table 16.

Table 16: Loading Factors

	B	SE	Wald	df	Sig.	Exp(B)	Loading Factor
LOC			8.203	9	.514		
Region 1	.584	1.091	.287	1	.592	1.794	0
Region 2	.931	.845	1.214	1	.271	2.538	0
Region 3	1.245	1.003	1.540	1	.215	3.473	0
Region 4	.890	.753	1.396	1	.237	2.434	0
Region 5	-.592	1.278	.214	1	.643	.553	0
Region 6	-.307	.988	.096	1	.756	.736	0
Region 7	1.446	.895	2.607	1	.106	4.245	1.446
Region 8	1.442	1.307	1.217	1	.270	4.231	0
Region 9	.866	1.082	.640	1	.424	2.377	0
ECN			16.191	6	.013		
Agriculture	1.085	.760	2.037	1	.154	2.959	0
Fishing	-1.002	.341	8.641	1	.003	.367	-1.002
Forestry	.337	.629	.287	1	.592	1.400	0
Mining/quarrying	2.431	1.274	3.642	1	.056	11.368	2.431
Manufacturing	-.202	.795	.064	1	.800	.817	0
Services	-.358	.471	.578	1	.447	.699	0
GP	.612	.678	.815	1	.367	1.845	0
REG: GRA	.288	.663	.189	1	.664	1.333	0
REG: NIS	.656	.544	1.455	1	.228	1.926	0
REG: Deeds Registry	.536	.566	.897	1	.344	1.709	0
FIN1: Own	-.182	.526	.120	1	.729	.834	0

FIN2: Commercial banks	-.436	.628	.482	1	.487	.646	0
FIN3: IPED/SBDF	.210	.856	.061	1	.806	1.234	0
FIN4: SBB	.390	1.298	.090	1	.764	1.477	0
FIN5: Family/friend	.242	.465	.271	1	.603	1.273	0
LF			1.225	3	.747		
Sole proprietorship	5.668	80.235	.005	1	.944	289.594	0
Partnership	5.790	80.235	.005	1	.942	326.859	0
Limited liability	7.099	80.245	.008	1	.930	1211.347	0
BS			.322	2	.851		
Price leadership	.502	1.087	.213	1	.645	1.651	0
Differentiation	.373	1.089	.118	1	.732	1.453	0
SIZE	.363	.215	2.854	1	.091	1.437	0.363
AGE	.103	.100	1.065	1	.302	1.109	0
EXP	-.240	.154	2.438	1	.118	.787	0
EDU	.167	.174	.920	1	.338	1.182	0
GEN	.817	.277	8.705	1	.003	2.264	0.817

Source: Survey data.

It is clear from Table 16 that gender, location, economic activities, and size were significantly different from zero. The other variables were not significant. As such, to compute the z-score, the coefficients associated with the significant variables (highlighted in yellow in the table) are used as loading factors. All the other variables are assigned loading factors equivalent to zero since the coefficients were not significantly different from zero in our model.

Example: Assume we have three companies with information related to the owners and the profile of the business at the time it was established. Table 7 summarizes the data for the companies.

Table 17: Information Related to Owners and Companies at the Time They were Established

Profile	Company A	Company B	Company C
Location (1 if yes, 0 otherwise)	Region 1	Region 7	Region 8
Economic Sector (1 if yes, 0 otherwise)	Forestry	Fishing	Agriculture
Government procurement (1 if yes, 0 otherwise)	No	Yes	No
Registered with GRA (1 for yes, 0 otherwise)	No	Yes	No
Registered with NIS (1 for yes, 0 otherwise)	No	Yes	No
Registered with Deeds Registry (1 for yes, 0 otherwise)	No	Yes	No
Source of start-up finance: Own (1 for yes, 0 otherwise)	Yes	Yes	Yes
Source of start-up finance: Commercial banks (1 for yes, 0 otherwise)	No	Yes	No
Source of start-up finance: IPED/SBDF (1 for yes, 0 otherwise)	No	No	No
Source of start-up finance: Family/friends (1 for yes, 0 otherwise)	No	No	No
Legal form: Sole proprietorship (1 for yes, 0 otherwise)	Yes	No	Yes
Legal form: Partnership (1 for yes, 0 otherwise)	No	No	No
Legal form: Limited liability (1 for yes, 0 otherwise)	No	Yes	No
Business strategy (Use 1 for price leadership, 2 for product differentiation).	1	1	2
Number of employees at the time the business was established. Use the following values: 1 (1 – 5 employees), 2 (6 – 10 employees), 3 (11 – 15 employees), 4 (20 – 25 employees), 5 (> 25 employees).	2	1	3
Age of owner at the time the business was established. Use the following values: 1 (< 20 years), 2 (20 – 25 years), 3 (26 - 30 years), 4 (31 – 35 years), 5 (> 35 years employees).	2	3	3
Industry experience of owner at the time the business was established. Use the following values: 1 (< 5	1	3	4

years), 2 (6 – 10 years), 3 (11 – 15 years), 4 (16 – 20 years), 5 (> 20 years employees).			
Educational background of owner at the time the business was established. Use the following values: 1 (Primary), 2 (Secondary), 3 (Technical/vocational), 4 (University).	4	1	1
Gender (1 for female, 0 for male)	Female	Male	Female

Source: Survey data.

A spreadsheet version of the risk calculator is presented in Table 18. The risk of failure is 82 percent, 69 percent, and 87 percent for Company A, Company B, and Company C, respectively.

Table 18: Risk Calculator

	Loading Factors	Company A	Company B	Company C
LOC				
Region 1	0.000	1.00	0.00	0.00
Region 2	0.000	0.00	0.00	0.00
Region 3	0.000	0.00	0.00	0.00
Region 4	0.000	0.00	0.00	0.00
Region 5	0.000	0.00	0.00	0.00
Region 6	0.000	0.00	0.00	0.00
Region 7	1.446	0.00	1.00	0.00
Region 8	0.000	0.00	0.00	1.00
Region 9	0.000	0.00	0.00	0.00
EMP	0.000	0.00	0.00	0.00
GS	0.000	0.00	0.00	0.00
EXP	0.000	0.00	0.00	0.00
EDU	0.000	0.00	0.00	0.00
Gender	0.817	0.00	0.00	0.00
ECN		0.00	0.00	0.00
Agriculture	0.000	0.00	0.00	1.00
Fishing	-1.002	0.00	1.00	0.00
Forestry	0.000	1.00	0.00	0.00
Mining/quarrying	2.431	0.00	0.00	0.00
Manufacturing	0.000	0.00	0.00	0.00
Services	0.000	0.00	0.00	0.00
GP	0.000	0.00	1.00	0.00
REG: GRA	0.000	0.00	1.00	0.00
REG: NIS	0.000	0.00	1.00	0.00
REG: Deeds Registry	0.000	0.00	1.00	0.00
F1: Own	0.000	1.00	1.00	1.00
F2: Commercial banks	0.000	0.00	1.00	0.00
F3: IPED/SBDF	0.000	0.00	0.00	0.00
F4: SBB	0.000	0.00	0.00	0.00
F5: Family/friend	0.000	0.00	0.00	0.00
LF	0.000	0.00	0.00	0
Sole proprietorship	0.000	1.00	0.00	1.00
Partnership	0.000	0.00	0.00	0.00
Limited liability	0.000	0.00	1.00	0.00
Business Strategy	0.000	0.00	0.00	0.00
Price leadership	0.000	1.00	1.00	0.00
Product differentiation	0.000	0.00	0.00	1.00
SIZE	0.363	2.00	1.00	3.00
AGE	0.000	2.00	3.00	3.00
EXP	0.000	1.00	3.00	4.00
EDU	0.000	4.00	1.00	1.00
GEN	0.817	1.00	0.00	1.00
Z-value		1.54	0.81	1.91
Probability of default		0.82	0.69	0.87

Source: Survey data.

6.0 Conclusion and Recommendations

6.1 Summary of Findings

SMEs play an essential role in the Guyanese economy, as they provide significant employment opportunities and contribute to wealth creation. However, these businesses were never given any serious policy attention prior to the enactment of the Small Business Act, which sets out an incentive regime to support SMEs. It includes: the establishment of a Development Fund, a guarantee of at least 25 percent of government procurement being directed to small firms, and establishment of the Small Business Council and Bureau to promote policies supportive of the small business sector. Notwithstanding, SMEs continue to be constrained and report high failure rates. One of the perennial complaints of small business owners is lack of access to affordable credit.

This study sought to identify the factors responsible for SMEs' survival and derive a prototypical risk calculator that could be used by financial intermediaries and business development agencies to screen and identify promising enterprises for financing and support. A country-wide survey was administered to collect data on SMEs and their founders. The CPMH and KM estimator were also employed.

The results indicated that women-owned SMEs were more prone to fail than men-owned SMEs. The age, educational background, and experience of the owners of these businesses were not significantly related to their survival. The location and type of economic activities pursued by SMEs impacted considerably on their survival. However, other firm specific-factors, such as access to government procurement, the legal form of the business, and the extent to which the businesses are formally registered with government agencies (e.g., GRA, NIS and Deeds Registry), were not found to be significant determinants of their survivability. Meanwhile, the impact of size as measured by the number of employees was inconclusive.

These findings have the following implications:

1. Efforts to encourage businesses to formalize their operations by registering with the GRA, NIS, and Deeds Registry may not necessarily enhance their survival.
2. The incubation of SMEs using government procurement should be applied with caution since this factor does not influence SMEs' survival.
3. The fact that the survivability of SMEs which accessed funding from lending institutions (e.g., commercial banks, IPED, and SBD) were not significantly different from those who were not able to access such funding means that the screening mechanisms applied by these institutions are ineffective in terms of distinguishing between 'good or viable SMEs' and 'weak and unviable SMEs.'
4. Contrary to the theory that firms organized as limited liability companies survive longer than sole proprietorships and partnerships, the results suggested no significant differences in the life of SMEs based on legal form.

6.2 Practical Recommendations for Strengthening Credit Programs Targeting SMEs in Guyana

First, initiatives designed to provide finance and other support, such as public procurement, should not be viewed as the panacea for helping SMEs to survive and grow. More ancillary

services, such as marketing assistance, quality assurance, financial planning and analysis, and business coaching may be needed in program delivery to improve survivability. Credit-only interventions and the incubation of businesses via public procurement that do not include training may be ill-designed.

Second, the criteria used for assessing the suitability of SMEs for various modalities of assistance under the MSED project should be reexamined. While this initiative places significant weight on the experience in business and the educational background of business owners, there are firm-specific factors which are also important. The evaluation framework should, therefore, be amended.

Third, under the MSED project, the SBB is required to establish and maintain a database of SMEs registered with the agency. The Act also empowers the SBB to collect and maintain a database of SMEs. With a database of this nature, a more robust risk model may be derived based on the post-entry performance of SMEs as well as the profile of these businesses at the time they were created. Kuwahara et al. (2015) provide a detailed description of a credit risk database utilized in Japan to develop SMEs. Specifically, in this study, the authors explained how the database was designed, why it was developed, its critical features, how it is used, and how the quality of the risk model is maintained. One of the primary benefits of the database is remedying the problem of asymmetric information between the suppliers of finance and SMEs. The authors also argue that the database could be used to determine a credit guarantee fee rate and loan collateralization amounts. Under the MSED project, the SBB offers credit guarantees, but there is no empirical framework to underpin the decision to support the provision of a guarantee. The credit database and risk model could serve to enhance MSED project performance in this regard. To date, the program has not been successful in approving a large number of loans and guarantees and seems to have had little utility. Standard conservative bank underwriting criteria are still being used, and the problem of lack of detailed financial information on the applicants continually appears.

6.3 Area for Future Research

This study attempted to determine the extent to which firm-specific characteristics and owner profiles affect the survivability of SMEs. The prototypical risk-calculator should be tested and validated on a larger sample of firms that received and did not receive credit post-entry. This type of research could be facilitated by developing a comprehensive risk database to assess the survivability of businesses. A fine gradation of analysis is also needed to pinpoint and test what location-specific factors—quality of infrastructure, quality of support institutions, agglomeration or cluster effects, distance to principal market, higher or lower levels of trust and social cohesion, and others—play a role in survivability. Also, since this research found informality to be a more beneficial factor than formality (legal incorporation, registration, social security contributions, etc.) in survivability, flexible organizational forms in coping with uncertainty and risk are a crucial factor that warrants more detailed analysis.

References

- Abouzeedan, A., and M. Busler. 2004. Typology analysis of performance models of small and medium-size enterprises (SMEs). *Journal of International Entrepreneurship* 2: 155–177.
- Amit R. and P. Schoemaker. 1993. "Strategic Assets and Organizational Rent." *Strategic Management Journal* 14: 33–46
- Agarwal, R. 1998. "Small Firm Survival and Technological Activity." *Small Business Economics* 11: 215–24.
- Arditi, D., A. Koksai, and S. Kale. 2000. "Business Failures in the Construction Industry." *Journal of Engineering, Construction and Architectural Management* 7(2): 120–32.
- Bates, T. and A. Nucci. 1989. "An Analysis of Small Business Size and Rate of Discontinuance." *Journal of Small Business Management* 27(4): 1–7.
- Batjargal, B. 2005. "Entrepreneurial Versatility, Resources and Firm Performance in Russia: A Panel Study." *International Journal of Entrepreneurship and Innovation Management Special Issue* 5(3,4): 284–97.
- Baum, J. A. C. 1989. Liability of Newness, Adolescence, and Obsolescence: Exploring Age Dependence in the Dissolution of Organizational Relationships and Organizations. *Proceedings of the Administrative Science Association of Canada* 10: 1–10.
- Beckman, J. and N. Marks. 1996. "Entrepreneurial Success and Previous Business Experience." *Southwestern Small Business Institute Association Proceedings*: 82–4.
- Boden, R. J. and A. R. Nucci. 2000. "On the Survival and Prospects of Men's and Women's New Business Venture." *Journal of Business Venturing* 15(4): 347–62.
- Boyle, R. and H. Desai. 1991. "Turnaround Strategies for Small Firms." *Journal of Small Business Management* 29(3): 33–42.
- Brüderl, J., P. Preisendörfer, and R. Ziegler. 1992. Survival Chances of Newly Founded Business Organizations. *American Sociological Review* 57: 227–42.
- Brüderl, J. and R. Schüssler. 1990. Organizational mortality: the liabilities of newness and adolescence. *Administrative Science Quarterly* 35: 530–47.
- Brush, C. G. 1992. "Research on Women Business Owners: Past Trends, a New Perspective, and Future Directions." *Small Business: Critical Perspectives on Business Management*: 1038–70.
- Cao, Y. 2012. "A Survival Analysis of Small and Medium Enterprises (SMEs) in Central China and their Determinants." *African Journal of Business Management* 6(10): 3834–50.
- Carroll, G and M. Hannan. 2000. *The Demography of Corporations and Industries*. Princeton, NJ: Princeton University Press.
- Chawla, S., R. Pullig, and F. Alexander. 1997. "Critical Success Factors from an Organizational Life-cycle Perspective: Perceptions of Small Business Owners from Different Business Environments." *Journal of Business and Entrepreneurship* 9(1): 47–58.
- Chaganti, R. and R. Chaganti. 1983). "A Profile of Profitable and Not-so-profitable Small Businesses." *Journal of Small Business Management*, 45–50.
- Cooper, A., W. Dunkleberg, and C. Woo. 1989. "Entrepreneurship and the Initial Size of Firms." *Journal of Business Venturing* 4(5): 317–32.
- DeTienne, D. R. and K. Wennberg. 2013. "Small Business Exit: Review of Past Research, Theoretical Considerations and Suggestions for Future Research." In: Newbert, S. (ed.) *Small Businesses in a Global Economy: Creating and Managing Successful Organizations*. Westport, CT: Praeger.

- Duchesneau, D. A. and W. B. Gartner. 1990. "A Profile of New Venture Success and Failure in an Emerging Industry." *Journal of Business Venturing* 5(5): 297–312.
- Fichman M. and D. Levinthal. 1991. "Honeymoons and the Liability of Adolescence: A New Perspective on Duration Dependence in Social and Organizational Relationships." *Academy of Management Review* 16: 442–68.
- Friedland, E. J., and C. E. Morris. 1976. "A Cross-section Analysis of Small Business Failure." *American Journal of Small Business* 1(1) 7–18.
- Geroski, P. A. 1995. "What Do We Know about Entry?" *International Journal of Industrial Organization* 13: 421–40.
- Hand, H., P. W. Sineath III, and E. W. Howle. 1987. "Small Business Concepts and their Relationship to Performance: A Field Study of Retail Service Stations." *Journal of Business Management* 25(2): 55–63.
- Hannan M. T. 1998. "Rethinking Age Dependence in Organizational Mortality: Logical Formalizations." *American Journal of Sociology* 104: 126–64.
- Hansen, H., J. Rand, and F. Tarp. 2009. "Enterprise Growth and Survival in Vietnam: Does Government Support Matter?" *The Journal of Development Studies* 45(7): 1048–69.
- Henderson, A. 1999. "Firm Strategy and Age Dependence: A Contingent View of the Liabilities of Newness, Adolescence, and Obsolescence." *Administrative Science Quarterly* 44(2): 281–314.
- Honjo, Y. 2000. "Business Failure of New Firms: An Empirical Analysis using a Multiplicative Hazards Model." *International Journal of Industrial Organization* 18: 557–74.
- Inkoun, L. 2003. "Portrait of the Entrepreneur's Characteristics. *Discussion Paper Series*. Accra, Ghana: University of Ghana.
- IPED. 2014. Annual Report. Available at http://www.ipedgy.com/reports/IPED_Annual_Report_2014.pdf
- Jennings, P. L. and G. Beaver. 1995. "The Managerial Dimension of Small Business Failure." *Journal of Strategic Change* 4(4): July/August: 185–200.
- Jo, H. and J. Lee. 1996. "The Relationship between an Entrepreneur's Background and Performance in a New Venture." *Technovation*, 16(4): 161–71.
- Klapper, L. and C. Richmond. 2009. "Patterns of Business Creation, Survival, and Growth: Evidence from a Developing Country." Available at http://www.iza.org/conference_files/worldb2010/richmond_c6055.pdf
- Koush. 2008. "Why do Small Firms Fail? Some Evidence from Korea." *Korean Journal of Economics* 79: 16–24.
- Kuwahara, S. et al. 2015. "Role of the Credit Risk Database in Developing SMEs in Japan: Lessons for the Rest of Asia." Working Paper No. 547. Tokyo: Asian Development Bank Institute.
- Lopez-Garcia, P. and S. Puente. 2006. "Business Demography in Spain: Determinants of Firm Survival." *Working Papers*. Vol. 0608. Madrid: Banco De Espana.
- Lussier, R. N. 1995. "A Non-financial Business Success versus Failure Prediction Model for Young Firms." *Journal of Small Business Management* 33(1): 8–24.
- Machin, D., Y. B. Cheung, and M. K.B. Parmar. 2006. *Survival Approach: A Practical Approach*. 2nd Edition. New York, NY: John Wiley & Sons, Ltd.
- Mahmood, T. 2000. "Survival of Newly Founded Business: A Log-logistic Model Approach." *Small Business Economics* 14: 223–37.

- McCartan-Quinn, D. and D. Carson. 2003. "Issues which Impact upon Marketing in Small Firms." *Small Business Economics* 21(2): 201–13.
- McGarrell, C. 2009. "Final Report Needs Assessment on the Small Business Sector in Guyana." Unpublished.
- Mellahi, K. and A. Wilkinson. 2004. "Organizational Failure: A Critique of Recent Research and a Proposed Integrative Framework." *International Journal of Management Reviews* 5/6(1): 21–41.
- Mengistae, T. 2006. Competition and Entrepreneurs' Human Capital in Small Business Longevity and Growth." *The Journal of Development Studies* 42(5): 812.
- Ministry of Social Protection, Government of Guyana. Website. Available at http://www.mlhsss.gov.gy/index.php?option=com_content&view=article&id=659:wow-programme-positively-impacting-single-mothers&catid=2:news&Itemid=45
- Nelson, R. R. and S. G. Winter. 1982. *An Evolutionary Theory of Economic Change*. Cambridge, MA: Harvard University Press.
- OECD. (Organisation of Economic Co-operation and Development). *Glossary of Statistical Terms*. Statistical Portal. Available at <https://stats.oecd.org/glossary/detail.asp?ID=3123>
- O'Neill, H. and J. Duker. 1986. "Survival and Failure in Small Business: An Application of Strategic Prescriptions in Entrepreneurial Firms." *Journal of Small Business Management* 24(1): 30–37.
- Ryan, G. and B. Power. 2012. "Small Business Transfer Decisions: What Really Matters? Evidence from Ireland and Scotland." *Irish Journal of Management* 31(2): 99–125.
- Ramis. 2002. The Impact of Management Training on SME Performance in Peru." *International Economic Review* 159: 136–41.
- Segarra, A. and M. Callejon, M. 2002. "New Firms' Survival and Market Turbulence: New Evidence from Spain." *Review of Industrial Organization* 20(1): 1–14.
- Stevenson, H. H. and D. E. Gumpert. 1985. "The Heart of Entrepreneurship." 63(2) (March-April): 85–94.
- Strotman, H. "Entrepreneurial Survival." 2007. *Small Business Economics* 28(1): 87–104.
- Tari, G. 2011. "Industrial Effects and Firm's Survival Case Study: Iran-East Azerbaijan Province." *World Academy of Science, Engineering and Technology* 5(2): 130–34.
- Vivarelli, M. 2004. "Are All the Potential Entrepreneurs So Good?" *Small Business Economics* 42: 141–54.
- World Bank. 2015. "Small and Medium Enterprise (SME) Finance Brief." Washington, DC Available at <http://www.worldbank.org/en/topic/financialsector/brief/smes-finance>
- Wu, B. and Z. M. Wang. 2007. The Survival Analysis of Small Start Businesses." *Sci. Res. Manage.*, 28: 41–44 (In Chinese).
- Zacharakis, A. L., G. D. Meyer, and J. DeCastro. 1999. "Differing Perception of New Venture Failure: A Matched Exploratory Study of Venture Capitalists and Entrepreneurs." *Journal of Small Business Management* (July): 1–14.

Appendix 1: Questionnaire

Visitation Record

Administrative Region (tick appropriate box)

Region 1: Barima – Waini	<input type="checkbox"/>	Region 6: East Berbice - Corentyne	<input type="checkbox"/>
Region 2: Pomeroon – Supenaam	<input type="checkbox"/>	Region 7: Cuyuni – Mazaruni	<input type="checkbox"/>
Region 3: Essequibo Islands - West Demerara	<input type="checkbox"/>	Region 8: Potaro - Siparuni	<input type="checkbox"/>
Region 4: Demerara – Mahaica	<input type="checkbox"/>	Region 9: Upper Takutu – Upper Essequibo	<input type="checkbox"/>
Region 5: Mahaica – Berbice	<input type="checkbox"/>	Region 10: Upper Demerara – Berbice	<input type="checkbox"/>
Area type			
Rural	<input type="checkbox"/>	Urban	<input type="checkbox"/>

Full Address (write out from list provided): [Insert contact number]

Respondent type

Business found	<input type="checkbox"/>	Business not found	<input type="checkbox"/>
Business not operational (or closed)	<input type="checkbox"/>	Business found but owner cannot be contacted	<input type="checkbox"/>

Script: You have been randomly selected to participate in this survey. If you agree to participate all the information provided will treated with strict confidentiality.

The purpose of the survey is to determine the factors which contribute to firm survival with the aim of deriving a risk calculator which may be used to assess the suitability of SMES for accessing credit.

The survey will take between 8 and 10 minutes to complete. You are free to say “I don’t know” or “I prefer not to answer” for any question.

Before I proceed any further I must ask whether you would like to participate in this survey. If the respondent says ‘NO’ thank him/her for his/her time and abort the interview. If the respondent says ‘YES’ proceed with the interview.

Script: I will start by asking a few questions about your business.

Code	How many persons(s) was/were employed by		
TYPE	your business when it commenced operation?	1 – 5 employees	<input type="checkbox"/> [1]
		6 – 10 employees	<input type="checkbox"/> [2]
		11 – 15 employees	<input type="checkbox"/> [3]
		16 – 20 employees	<input type="checkbox"/> [4]
		20 - 25 employees	<input type="checkbox"/> [5]
		>25 employees	<input type="checkbox"/> [6]
		Don’t know	<input type="checkbox"/> [88]
		No answer	<input type="checkbox"/> [99]

TYPE	How many persons(s) is/are currently employed by your business?	1 – 5 employees	<input type="checkbox"/>	[1]
		6 – 10 employees	<input type="checkbox"/>	[2]
		11 – 15 employees	<input type="checkbox"/>	[3]
		16 – 20 employees	<input type="checkbox"/>	[4]
		20 - 25 employees	<input type="checkbox"/>	[5]
		>25 employees	<input type="checkbox"/>	[6]
		Don't know	<input type="checkbox"/>	[88]
		No answer	<input type="checkbox"/>	[99]
TYPE	What is your annual sales	< \$20 million	<input type="checkbox"/>	[1]
		\$20.1 – \$40 million	<input type="checkbox"/>	[2]
		\$40.1 – 60 million	<input type="checkbox"/>	[3]
		> \$60 million	<input type="checkbox"/>	[4]
		Don't know	<input type="checkbox"/>	[88]
		No answer	<input type="checkbox"/>	[99]

NOTE: If the respondent employs less than 25 persons and generates less than \$60 million the interview should be continued. However, if these conditions are not satisfied, politely end the interview and contact your supervisor.

B. PROFILE OF BUSINESS OWNER

Code			
AGE	What was your age at the time you started the business?	< 20 years	<input type="text"/> [1]
		20 – 25 years	<input type="checkbox"/> [2]
		26 - 30 years	<input type="checkbox"/> [3]
		31 - 35	<input type="checkbox"/> [4]
		> 35 years	<input type="checkbox"/> [5]
		Don't know	<input type="checkbox"/> [88]
		No answer	<input type="checkbox"/> [99]
EXP	How many years industry experience you had at the time you started the business?	< 5 years	<input type="checkbox"/> [1]
		6 – 10 years	<input type="checkbox"/> [2]
		11 – 15 years	<input type="checkbox"/> [3]
		16 – 20 years	<input type="checkbox"/> [4]
		> 20 years	<input type="checkbox"/> [5]
		Don't know	<input type="checkbox"/> [88]
		No answer	<input type="checkbox"/> [99]
EDU	What was the highest level of education completed at the time you started your business?	Primary	<input type="checkbox"/> [1]
		Secondary	<input type="checkbox"/> [2]
		Technical Inst.	<input type="checkbox"/> [3]
		University	<input type="checkbox"/> [4]
		Don't know	<input type="checkbox"/> [88]
		No answer	<input type="checkbox"/> [99]
SEX	Gender of business owner. Do not ask question about gender	Male	<input type="checkbox"/> [1]
		Female	<input type="checkbox"/> [2]

C. PROFILE OF BUSINESS

Code

Status **Is your business still operational?** Yes [1]
 No [0]

If the answer is YES, ask which year the business was established.

Year the business was established:

However, if the answer is NO, they ask how many when the business was established and the year it was closed:

Year the business was established:

Year the business was closed:

SEC **Which economic sector is your business part of?**

Agriculture (farming: rice, sugar, cash crop, livestock)	Agriculture	<input type="checkbox"/>	[1]
Fishing (aquaculture, commercial fishing)	Fishing	<input type="checkbox"/>	[2]
Mining (gold, diamond, sand, stone)	Forestry	<input type="checkbox"/>	[3]
Services (construction, wholesale, retail, transportation, storage, information/communication, health service, real estate, other services)	Mining/Quarrying	<input type="checkbox"/>	[4]
Manufacturing	Manufacturing	<input type="checkbox"/>	[5]
	Services	<input type="checkbox"/>	[6]
	Don't know	<input type="checkbox"/>	[88]
	No answer	<input type="checkbox"/>	[99]

PRO **Do you benefit from government procurement?**
 Yes ___ [1] No ___ [2] No Answer ___ [99]

REG **When you started your business was it registered with:**

GRA Yes ___ [1] No ___ [2] No Answer ___ [99]
NIS Yes ___ [1] No ___ [2] No Answer ___ [99]
Deed Registry Yes ___ [1] No ___ [2] No Answer ___ [99]

SUC **If the business is operational (or alive), ask what is the number one factor responsible success.**

Where the business owner suggest 'OTHER' ask to specify: _____ - _____

Access to market	<input type="checkbox"/>	[1]
Access to finance	<input type="checkbox"/>	[2]
Networking	<input type="checkbox"/>	[3]
Firm size	<input type="checkbox"/>	[4]
Experience	<input type="checkbox"/>	[5]
Location	<input type="checkbox"/>	[6]
Yrs. in the business	<input type="checkbox"/>	[7]
Education	<input type="checkbox"/>	[8]
Diversified portfolio	<input type="checkbox"/>	[9]
Other	<input type="checkbox"/>	[10]
Don't know	<input type="checkbox"/>	[88]
No answer	<input type="checkbox"/>	[99]

FAIL Limited markets [1]

If the business is not operational (or dead), ask what is the number one factor responsible failure.

Where the business owner suggest 'OTHER' ask to specify: _____ -

- Limited finance [2]
- Poor Networking [3]
- Firm size [4]
- Experience [5]
- Location [6]
- Yrs. in the business [7]
- Education [8]
- Non-diversified portfolio [9]
- Other [10]
- Don't know [88]
- No answer [99]

OTHER INFORMATION

FUNDS What were the main source(s) of finance to start up the business?

- Own funds _____ [1]
- Commercial banks _____ [2]
- IPED/Small Business Development Trust _____ [3]
- Small Business Bureau _____ [4]
- Friends/Family _____ [5]

NOTE: If the respondent identifies more than one source ask what percentage came from the sources.

In percentage terms, how much funds were obtained from the sources identified?

- Own funds _____ <25% _____ 25-50% _____ 25-75% _____ >75%
- Commercial banks _____ <25% _____ 25-50% _____ 25-75% _____ >75%
- IPED/Small Business Development Trust _____ <25% _____ 25-50% _____ 25-75% _____ >75%
- Small Business Bureau _____ <25% _____ 25-50% _____ 25-75% _____ >75%
- Friends/Family _____ <25% _____ 25-50% _____ 25-75% _____ >75%

OWN

What type of business did you form? [tick appropriate box]:

Sole proprietorship _____ Partnership _____ Limited Liability Company _____ Other _____

If other specify:

STRAT _____

What is true about your business? [tick appropriate box]

Your business offers good(s)/service(s) already available in the market but at a lower price

Your business offers unique product(s)/service(s) to the market.

Script: Let me thank you for participating in this survey. Have a blessed day.

End interview.

Appendix 2: Agencies Contacted

Small Business Development Finance Trust

5 Hadfield Street
Georgetown

Tourism Hospitality Association Guyana

157 Waterloo Street
South Cummingsburg
Georgetown

Go- Invest (Guyana Office for Investment)

190 Camp & Church Streets
Georgetown

Guyana Tourism Authority

National Exhibition Centre
Sophia
Greater Georgetown

New Guyana Marketing Corporation

87 Robb & Alexander Streets
Georgetown

Guyana Arts & Craft Association

Hibiscus Craft Plaza
GPO Building Robb Street
Georgetown Guyana

Documentation Centre/Registry

Caricom Community Secretariat
Turkeyen
Greater Georgetown

Guyana Small Business Association

160 Waterloo Street
North Cummingsburg
Georgetown

President Guyana Agro Processors Association

19 Public Road
Enterprise

Region 10 Farmers Association (RTFA)

LEAP Building
97-98 Republic Ave
Mackenzie, Linden.

Ministry of Agriculture

Regent Street & Shiv Chanderpaul Drive
Georgetown

Guyana Geology and Mines Commission

Brickdam
Stabroek
Georgetown

Guyana Gold & Diamond Miners Association

29 North Road
Bourda
Georgetown

Association of Regional Chambers' of Commerce

Sophia Exhibition Complex
Greater Georgetown

Bartica Chamber of Commerce and Industry

Berbice Chamber of Commerce

12 Chapel Street
New Amsterdam
Berbice

Cabacaburi Handicraft Association

Cabacaburi Mission
Pomeroon River
Essequibo

Central Corentyne Chambers of Commerce

Lot 7 Charlotte Street
New Amsterdam
Berbice

Consultative Association of Guyanese Industry

157 Waterloo Street
Georgetown

Essequibo Chamber of Commerce and Industry

Lot 6
Anna Regina
Essequibo

Forest Products Association of Guyana

157 Waterloo Street,
North Cummingsburg
Georgetown

Georgetown Chamber Of Commerce

156 Waterloo Street
North Cummingsburg

Guyana Manufacturing & Services Association

National Exhibition Centre
Sophia
Greater Georgetown

Guyana Rice Producers' Association

126 Parade Street
Kingston
Georgetown

Guyana Small Business Association

Maraj Building
185 Charlotte & King Streets
Georgetown

Guyana Women Artists' Association Georgetown

63E½ Fifth Avenue Subryanville

**Institute Of Private Enterprise
Development**

253-254 South Road
Bourda
Georgetown

Lethem Chambers of Commerce

Linden Chamber of Industry & Commerce
97-98 Republic Avenue, Wismar

**Mahaica Chamber of Commerce and
Industry**

c/o Budget Supercentre, 16 Richardstown,
Lusignan

**Matarkai Chamber of Commerce and
Development Association**

Port Kaituma

Private Sector Commission

157 Waterloo Street
Georgetown

Rupununi Chamber of Commerce

Lethem
Rupununi

Shipping Association of Guyana

Upper Corentyne Chamber of Commerce
and Industry
Lot 59, East Public Rd., #78 Village,
Corriverton

**West Demerara/East Bank Essequibo &
Islands Chamber of Commerce and
Industry**

Lot A Oceanview Drive
Ruimzeight Gardens
Greater Georgetown

**Guyana Rice Millers' and Exporters'
Development Association**

216 Lamaha Street
North Cummingsburg
Georgetown