# HOW'S BUSINESS? MANUFACTURING SMALL, MEDIUM AND MICRO ENTERPRISES' (SMMEs') CONTRIBUTIONS TO THE FORMAL SECTOR EMPLOYMENT IN GAUTENG AND THE WESTERN CAPE BETWEEN 2007 AND 2013

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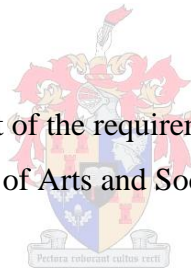
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ABSTRACT

Job creation through support to Small, Medium and Micro Enterprises (SMMEs) is one of the government's priorities in the National Development Plan 2030 (NDP 2030) to overcome the chronic unemployment situation faced by millions of South Africans. According to Gibrat's Law businesses have the same potential for growth regardless of their initial size. Jovanovic's Passive Learning Model extends Gibrat's Law by including age into the calculation – businesses learn through experience which determines if it will survive or not. This article uses the panel data from 2007 to 2013 from the Quarterly Employment Statistics (QES) from Statistics South Africa (Stats SA) to calculate Ordinary Least Squares regression models to test Gibrat's Law and Jovanovic's Passive Learning Model to determine if formal manufacturing SMMEs in Gauteng and the Western Cape experience more business growth in terms of employment and turnover than larger formal manufacturing businesses. Results indicate that Gibrat's Law and Jovanovic's Passive Learning Model were both rejected with regards to employment, indicating that Small, medium, micro enterprises (SMMEs) grow faster than larger businesses. Conversely, both models were accepted in terms of turnover; the experiences gained by businesses operating in the market over the years allow larger businesses to grow at a faster rate than SMMEs. These results support the NDP 2030 policy that more jobs can be created once government finds innovative ways to support manufacturing SMMEs.

OPSOMMING

Werkskepping deur ondersteuning aan klein, medium en mikro ondernemings (KMMOs) is een van die regering se prioriteite in die Nasionale Ontwikkelingsplan (NOP) om die kroniese werkloosheidsituasie wat deur miljoene Suid-Afrikaners ervaar word te oorkom. Volgens Gibrat se Wet het besighede dieselfde potensiaal vir groei ongeag hul aanvanklike grootte. Jovanovic se Passiewe Leer Model verleng Gibrat se Wet deur ouderdom in die bereken in te sluit − besighede leer deur ervaring, wat bepaal of dit sal oorleef of nie. Hierdie artikel gebruik paneel data vanaf 2007 tot 2013 vanaf die Kwartaallikse Indiensneming Statistieke van Statistiek Suid-Afrika om gewone kleinstekwadrate regressie modelle te bereken om Gibrat se Wet en Jovanovic se Passiewe Leer Model te toets om te bepaal of formele vervaardigings KMMOs in Gauteng en die Wes-Kaap meer besigheidsgroei in terme van indiensneming en omset toon as groter formele vervaardigingsbesighede. Resultate toon dat Gibrat se Wet en Jovanovic se Passiewe Leer Model word altwee in terme van indiensneming verwerp, wat aandui dat KMMOs vinnger as groter besighede groei. In teenstelling, beide modelle word in terme van omset aanvaar; die ervaring wat deur besighede opgedoen word deur oor 'n paar jaar in die mark te werk, laat groter besighede toe om teen 'n vinniger koers as KMMOs. te groei. Hierdie resultate ondersteun die NOP beleid dat meer werksgeleenthede geskep kan word sodra die regering innoverende maniere kan kry om vervaardigings KMMOs te ondersteun.

Trefwoorde en frases: Klein, medium en mikro ondernemings (KMMOs); Vervaardigingsbesighede in die formele sektor; Indiensneming; Omset; Gibrat se Wet; Jovanovic se Passiewe Leer Model.

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SECTION 1: SETTING THE SCENE

1.1 INTRODUCTION

The world capitalist economy is increasingly influenced by the processes of globalisation, which increases international market competition, resulting in an unequal world economic structure where larger more established businesses are beneficiaries of massive economies of scale, while smaller businesses find it difficult, and in some cases almost impossible, to compete and survive in oversaturated markets. This situation is even more pronounced for businesses from developing countries that struggle to compete with businesses from developed countries (Cass 2012; Muhammad et al. 2010). For smaller businesses to survive in a capitalist economy, both the developed and developing countries should invest in the new innovative operating technology and new improved practices and products that efficiently use the limited resources available to them (Fulton et al. 2009; Powell 2000; Voulgaris et al. 2003). The governments in the developing countries believe that viable employment opportunities to millions of the unemployed can be created, only if government can provide a supporting environment to Small, Medium, Micro Enterprises (SMMEs) (National Planning Commission [NPC] 2011, Small Business Project [SBP] Alert 2013). This is due to SMMEs being considered to be more labour-intensive, operating at a low-capital cost and being more flexible to withstand adverse economic conditions than larger businesses (Kayanula et al. 2000; NPC 2011; SBP 2013).

Apartheid's legacy deprived the black majority of wealth and educational opportunities, which resulted in a lack of entrepreneurial skills, and restricted black entrepreneurship to smaller businesses only. Consequently, the apartheid government did not provide enough support to smaller black-owned businesses, making it difficult for them to enter and compete with larger white-owned businesses in the local and global economy (Rogerson 2004, 2006). In the 1980's the apartheid government started to notice the contribution of smaller businesses to the economy; resulting in the establishment of the Small Business Development Corporate (SBDC). The SBDC only implemented transformative racially unbiased business initiatives in the late 1980's (Berry et al. 2002).

The Department of Trade and Industry (DTI 2005) of the post-apartheid government implemented many policies and institutions including the White Paper on the National Strategy for the development and promotion of SMMEs in South Africa (1995), the Centre for Small-Business Promotion 995); National Small Business Act (NSBA) (1996), National Small Business Council

(NSBC) (1996), Khula Enterprise Finance Limited (1996), and more recently the National Development Plan (NDP) (2011); these were aimed at assisting the development and promotion of SMMEs. The White Paper on Small Businesses focused on wealth redistribution, employment creation, and stimulation of economic growth, and also on providing SMMEs with the equal opportunities to be more competitive in the local and global markets (Cass 2012). The CSBP was responsible for the establishment, coordination and monitoring of the NSBA, which re-established government's commitment to facilitating and creating an enabling environment for SMMEs in South Africa. The NSBA provided a comprehensive definition for SMMEs which overcame the historical biased definition and categorisation of the businesses into medium, small, very small and micro based on the number of employees, total annual turnover, and the total gross asset values which excluded the fixed property (DTI 2005). The definitions of these categories vary between the different economic sectors, as per the International Standard Industrial Classification (ISIC). The CSBP also established the NSBC, Ntsika Promotion Agency and Khula Enterprise Finance Limited which were aimed at implementing the strategies stated in the White paper, provide the financial and the non-financial support in establishing of the SMMEs in South Africa (Cass 2012; DTI 2004). The NSBC was closed down in 1997 due to allegations of corruption (Cass 2012; DTI 2005, 2008).

More recently the NDP was implemented with the aim of providing government support for the growth and development of entrepreneurial SMMEs. This would be achieved through the development of financial institutions, establishing public and private incubators which assist in providing services to SMMEs (e.g. business planning, legal, accounting, and marketing support), provision of government subsidies to start SMMEs and labour-regulation reforms (NPC 2011). It was believed that through the implementation of these programmes, amongst other things, the economy would be able to create 11 million new jobs by 2030, which will reduce the unemployment rate to 14% by 2020 and 6% by 2030 (NPC 2011).

Despite the establishment of the post-apartheid government policies and institutions, South Africa still remains under-developed and unable to create new permanent and reliable employment opportunities (Cass 2012). This resulted in a very slow economic growth rate of 3% on average for the past three years which is much lower than the other African countries, a high unemployment rate of 25.2% in the first quarter of 2014, and an increased number of people (23 million) living below the upper-bound poverty line of R620 per capita per month in 2011 prices (Statistics South Africa [Stats SA] 2014a, 2014b, 2014c). Unemployment continues being chronic amongst black people, especially women, the youth and those with educational qualifications below Grade 12 (Stats SA2014a). Additionally the Word Economic Forum Global Risk report indicated that South Africa has the third highest unemployment rate amongst youth between the ages of 15-24, after

Greece and Spain, with 50% of the youth being unemployed (World Economic Forum [WEF] 2014).

The SMMEs in the manufacturing sector experiences similar challenges. The manufacturing sector is one of the main contributors to the national Gross Domestic Product (GDP), with Gauteng and the Western Cape contributing the most to this sector (Stats SA 2013). These challenges include the financial and non-financial entrepreneurial support initiatives, entrepreneurial training, and capacity building initiatives (Gauteng Department of Economic Development 2014). Additionally, manufacturing, tourism and business service sectors also experienced stagnant or slow business growth rendering it impossible to create new employment opportunities due to not having business plans in place for future growth, being fully staffed, having skills shortages, having to navigate through the complicated labour regulations, experiencing financial or cash-flow constraints and business or workload declines due to an overall poor economic climate in South Africa (NPC 2011; SBP 2011).

The research aims to determine if manufacturing SMMEs in the formal economy are growing at a faster rate in comparison to larger manufacturing businesses or vice versa in Gauteng and the Western Cape from 2007 to 2013. The article is organised as follows: section 2 presents the literature reviews which focuses on the theoretical frameworks of the Gibrat's Law and the Jovanovic's Passive Learning Model and examples of studies where these two theoretical frameworks have been applied Section 3 describes the datasets and methodology used in the study, section 4 discusses the results from this research; while section 5 concludes the article with some policy implications.

SECTION 2: MANUFACTURING SMMEs' CONTRIBUTIONS TO FORMAL SECTOR EMPLOYMENT: EXPERIENCES FROM THE LITERATURE

2.1 SMMEs IN THE GLOBAL ECONOMIC STRUCTURE

Capitalist globalisation is the economic policy that enables national economies to participate more freely in a borderless global market competition (Molla et al. 2007). Globalisation can be defined as the process of an increased relationship between country economies through international trade, foreign direct investments by multinational businesses, capital flow, migration and international finances such as providing aid (Lucas 2007). The resulting increased competition from multinational businesses in the global market, encourages businesses to be vigilant by continuously working on the development of new innovation, technologies and processes in order to survive (Zoltan et al. 2009). In the developed countries, businesses benefit from globalisation through outsourcing and off-shoring their production to the developing countries that is abundant with unskilled, and less expensive labour cost. They do this with the aim of assisting in reducing the chronic high unemployment situation experienced by most of the developing countries (Lucas 2007). Consequently, the developing countries benefit from the creation of employment, raising income levels and improved standards of; leading to reduced poverty (The Economic and Social Research Council 2008). Currently, South Africa has benefited from globalisation especially in the manufacturing of cars having 8 big international car manufacturers, namely BMW, Mercedes Benz, Ford, GM, Nissan, Renault, Toyota and Volkswagen, contributing approximately 7.9% to the national GDP and employing approximately 307 000 people (Kilfoil 2010). The plants manufacture the cars in South Africa, and then export them to countries like Japan, Australia, and the United States of America (USA), contributing 16% to the country manufacturing output (DTI 2010; Kilfoil 2010).

Unfortunately, globalisation has brought competition to the SMMEs, especially in the developing countries including South Africa. Additionally, South Africa was only allowed access into the global market after the fall of apartheid, thus in effect it was competing with itself. Consequently, only larger businesses manage to dominate the local and global markets, while SMMEs still find it difficult and virtually impossible to enter, compete or participate in the global market (i.e. export activities) (Cass 2012). Due to this reason, governments should encourage and nurture SMMEs to grow stronger in the local markets, before they can expand to the international market in order to accelerate growth.

In the formal economy, the rise of globalisation has increased competition in both the developed and the emerging economies, with the small and medium businesses being the mostly affected; as a result, small and medium businesses involved in entrepreneurship, seek to identifies and explore the unexplored opportunities internationally in order to survive (Bayer 2012; European Union[EU] 2012). Small and medium businesses that are engaged in international activity tend to grow and report higher revenues compared to the ones that are local based; the EU observed the SMEs involved in exports trade, and it was reported that SMEs involved with international trades were growing more than twice as twice as fast than those that are not involved (Association of Charted Certified Accountants [ACCA] 2013). In the developing countries SMMEs are critical for the economic development, through playing an important role when it comes to job creation and generating income for the low skilled; which in return fosters economic growth and contribute significantly to the development of the private sector (International Financial Corporation [IFC] 2011).

The global economy has a formal and informal side. The formal economy includes economic activities that are occurring within the boundaries of government Laws, rules and regulations. The formal economic activities do not offer enough formal job opportunities due to the government's imposement of high taxes and stringent labour regulations (Beyer 2012; International Labour Organisation [ILO] 2002). This process enhances the development of the informal economy, which is especially prevalent in the developing countries. The informal economy can be defined as diversified economic activities, income and job opportunities that are fall fully or partially outside the government's regulations and taxation system (ILO 2002; World Bank 2013). Although informal economic activities result in the loss of government revenue, it simultaneously provides employment opportunities to mostly unskilled workers (Cheng 2012). As an example, the informal economy consists of approximately 60% of all non-agricultural employment opportunities in developing countries – thus not only does it contribute significantly to job creation, but also the income generation in developing countries (ILO 2002). In the South African context, the formal economy is dominating in the economic growth of the country by providing most formal employment opportunities. In 2008, it was dominated by approximately 90% of businesses being registered in SMMEs, which contributed between 24-34% of the national gross domestic product (GDP) (DTI 2008).

The formal economy consists of varying businesses with varying sizes. In most international literature the smaller businesses are referred to as Small and Medium Enterprises (SMEs) (Goss et al. 1992). SMEs in the formal economy are categoriesed and defined differently across different

countries. The criteria of defining the SMEs "ranges from qualitative criteria such as independent ownership from formal registration, to quantitative statistical criteria such as the number of employees, annual turnover and [the] total [number of] assets" (Kesper 2000: 12). The international definition of SMEs stipulates that businesses must be registered and must employ fewer than 250 people (Financial Corporation 2009). For example in Australia, qualitative definitions for the term SMEs are used, but in the cases where quantitative definitions are used including the number of employees, turnover and the total number of assets, it is recommended that it should be sector-specific (Barrett 1998). In the case of the British government, they formulated two of definitions of small businesses which consisted of the economic and the statistical definition. The economic definition considered that business is a small business when it met the following three conditions, namely that the business has a relatively small share of their market; be managed by owner or part-owner in a personalised way i.e. not managed through a medium or a formalised management structure; must exist independently (Barrett 1998); while for the statistical definition considered only the businesses size, sector, its contribution to the GDP, employment, exports output, and the extent to which the small businesses sector's economic contribution had changed over time (Sarpong 2012). The Japanese defined the small-scale business in terms of the type of industry, their paid up capital and the number of employees they have paid. The small and medium businesses in different industries for example in Manufacturing were defined as businesses with 100 million yen paid-up capital and with not more than 300 numbers of employees; while in other sectors of the economy are defined using between 10 million yen paid-up capital and with not more than 100 number of employees (Ekpenyong et al. 1992). In Ghana different institutions defined SMEs using different criteria, with the mostly used criterion being the number of employees (Kayanula et al. 2000). The SMEs in Ghana contribute approximately 69% to the total population, contributing significantly to employment for people in the rural areas (Sarpong 2012); with approximately 85% of employment being in the manufacturing sector because Ghana is said to be characterized by production landscape (Aryeetey 2001). The Ghana Statistical Services (GSS) defines businesses with less than 10 employees as small-scale businesses; and also uses the value of fixed assets of the businesses as an alternative criterion when defining SMEs (Kayanula et al. 2000). On the other hand, Ghana Enterprise Development Commission uses ten million cedi's upper limit when defining the manufacturing of plant and machinery SMEs (Kayanula et al. 2000).

In South Africa, small businesses are defined and named differently to the international SMEs definition; where they are named the Small Medium and Micro Enterprises (SMMEs) (NSBA 1995; Rogerson 1998). The definitions between South Africa and international definition are in agreement when it comes to the condition that the SMMEs or simply SMEs need to be a registered formal

business; this is important because it allows governments to be able to assess the contribution made by these small businesses to their respective economies (Mago et al. 2013).The NSBA stipulates that micro businesses are those businesses which mostly employs not more than five people, and mostly they operates informally and do not have fixed business premises (or location). Their annual turnover is mostly below the Value Added Tax (VAT) registering threshold, with some of the micro enterprises registering voluntarily for VAT due to their own different reasons (R150 000[1] as stated in the NSBA 1996). Mostly, the owners of these micro businesses do not have the necessary management skills required (Falkena et al. 2001). The small businesses are better established businesses, registered and operating in a fixed business location with a minimum of 100 paid employees' performing their duties at that fixed business location, they tend to exhibit more of a complex business practices. Lastly, the medium businesses are owned and managed with clear reporting lines, always complying with legislation and the Law. They have a similar feature as the small businesses of being organised into a complex structure with complex business practices (Falkena et al. 2001, Molefane 2008).

2.2 THEORIES EXPLAINING GROWTH OF SMMEs

National economic growth is influenced by the growth of businesses, which is correlated to the factors like macroeconomic growth rates, employment rates and standards of living (Carrizosa 2006). Consequently, the growth of businesses has a comprehensive impact on performance of the economy and this makes the relationship between the businesses growth rate, size (in terms of turnover and the number of employees) and age, which are the important factors for government when developing of policies relating economic growth and SMMEs development i.e. whether government focus should be on the development of SMMEs or continues with the legacy of giving attention to only the large businesses (Relander 2011).

Robert Gibrat developed a stochastic firm growth formula in 1931, which test the relationship between business growth and its size (as measured by turnover and the number of employees) called the Law of Proportionate Effect also most commonly called Gibrat's Law (Gjini 2014). Gibrat's Law hypothesises that business growth is independent of its initial size, implying that if businesses are innovative, they will grow and survive at the same rate regardless of their size. Stated differently, medium and small businesses can grow at the same rate as larger firms (Nemaenzhe 2010). Gibrat's Law influenced the hypothesis of Simon & Bonini (1958) that a business' growth

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[1] The threshold was revised to R300 000 in the 2004/2005 financial year and subsequently raised to R1 million in 2008/2009 financial year.

rate is independent of its initial size and that the distribution of a business' growth rate will have a skewed tail due to the market being oversaturated with medium and small businesses. Gibrat's Law opposes classical economic theories which postulate that there is equilibrium in which the businesses grow, regardless of their sizes, and he also struggled to explain why businesses have different sizes in the market (Carrizosa 2006).

Jovanovic's (1982) introduced the Passive Learning theoretical Model which succeeded Gibrat's Law; stating that businesses learn about their potential profitability through experiences while operating. This information can then be used to decide if the businesses will be expanded or not. In simple terms, Jovanovic's Passive Learning Model indicates that a business' annual growth rate will be determined by the ability of the manager in doing his work correctly and by the accurate pricing of products or services. This model implies that there is a relationship between a business' growth rate, its size and age – in other words, an extension of Gibrat's Law – a business will be more successful with more years in the market, as its manager's estimation of its efficiency becomes increasingly more accurate with experience gained (Ahiawodzi et al. 2012; McPherson 1996).

2.3 EMPIRICAL STUDIES APPLYING GIBRAT'S LAW AND JOVANOVIC'S PASSIVE LEARNING MODEL

Empirical studies have been conducted applying Gibrat's Law and Jovanovic's Passive Learning Model on the evolution of business growth rates. Only empirical studies that have been applied to manufacturing industries are reported in the literature, with some accepting and others rejecting these two models[2].

There are two opposing camps in terms of the application of Gibrat's Law and Jovanovic's Passive Learning Model; one indicating that these models are accepted, implying the businesses grow at the same rate independent of their size and the other indicating that the models are rejected, implying the smaller businesses are growing at the faster rate than the large businesses or vice versa.

The earliest studies conducted, most of them were in agreement with the Gibrat's Law. In 1990, Gibrat's Law tested and accepted in the case of manufacturing businesses in the USA using time

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[2] The empirical studies of Acs & Armington 2001; Audretsch et al. 2004; Evans (1987a, 1987b) are summarised in the work of Santarelli et al. 2003.

series between the period of 1976 and 1980, the results from the study concluded that only in the case of 60% of the industries the Gibrat's Law was accepted and the rest were rejected. Subsequently, in 1994 using data of Germany, manufacturing firms were used to test for the Gibrat's Law between the period of 1978 and 1990; and also the results concluded that Gibrat's Law was accepted (Santarelli et al. 2003).

Contrary to the earlier studies, most of the latest and the most recent studies rejected the Gibrat's Law and the Jovanovic's Passive Learning Model. These studies are discussed in the following order: developed countries, then developing and African countries and finally South Africa. The latest studies was conducted by Morone & Testa (2008) in the USA, and the study was interested in the impact of the firm size and its age on the firm growth i.e. testing the Jovanovic's Passive Learning Model. The results showed that there was a negative linear relationship (correlation) between the firm's size and age with the firm's growth rate; implying that young firms show evidence of more positive growth rate, and the study rejects the model (Santarelli et al. 2003). In 2007, Gibrat's Law tested for the manufacturing and services businesses in Brazil, using the employment and the value added variables. The panel dataset was used, and Ordinary Least Squares (OLS) was used for regression analysis using both the employment and the value added variable as measures of size; in both cases the Gibrat's Law was rejected, implying that for both sectors smaller businesses were growing faster than the large businesses (Esteves 2007).

In 2005, Jovanovic's Passive Learning Model was tested using the United Kingdom (UK) manufacturing sector. Regression method was used to implement the panel unit root method when testing whether the model hold, using the gross output, number of employees and real gross Value Added as measures of size. The results rejected the model implying that smaller businesses grew at the faster rate compared to the larger businesses with regards to number of employees used as a measure of size; and when using the real gross output and the real gross Value Added the results showed that larger businesses tend to grow faster than the smaller businesses (Esteves 2007).

Furthermore in 2001, Gibrat's Law was tested using sales, assets and the number of employees as measures of size, on the Swedish business data. The results were rejected in both instances and showed that there was a negative relationship between businesses growth and its size when using number of employees as a measure of size, indicating that the smaller businesses grew faster than the larger businesses; and when using sales and

assets as a measure of size results showed that there was a positive relationship between businesses growth and its size, implying that the larger businesses grew at a faster rate than the smaller businesses (Carrizosa 2006; Esteves 2007; Gjini 2014; Nassar et al. 2013).

In 2012, the Uganda manufacturing panel data obtained from the World Bank where Gibrats's Law and Jovanovic's Passive Learning Model was used to test the effects of investment climate factors (factors such as the business size, age, education) on manufacturing firms' growth rates. The stepwise regression analysis was used to test the Gibrat's Law and the Jovanovic's Passive Learning Model. The results from the regression rejected the Gibrat's Law and the Jovanovic's Passive Learning Model, indicating that these investment climate factors were the main drivers of firm growth in the Ugandan manufacturing businesses. The results showed that that the medium sized and the larger businesses were showing evidence of growing faster than smaller businesses the In 2010, the Asia Pacific Industrial Engineering and Management System used a panel data to tested whether the Gibrat's Law is accepted, using the SMEs manufacturing sector in Indonesia. The study applied the mean of growth rates method to test whether the means across the size classes are the same, and also compared the variance of growth rates across size classes using the employment as a measure of size. The results from the study showed that the smaller businesses tend to grow faster than the large businesses, and this is attributed to smaller businesses having bigger opportunities to growth (Aggrey 2012; Runtuk et al. 2010)

In the South African context, in 1994 McPherson conducted a study into five Southern African countries manufacturing businesses, namely: Swaziland, Lesotho, Botswana, Zimbabwe and South Africa. Across all these countries, various variables of the businesses were collected. The set of variables measured was the businesses age and size and the classification using the ISIC. Age was measured in year from the birth of the firm to the time the study was conducted, and in logarithmic terms; while the size was measured by the numbers of regular workers (included the full time and the part-time workers). In addition to these variables, a complete set of firm's size quadratic and interaction terms were included, this was done to follow the Evans (1987) and Dunne at al. (1989) who found that such terms were also significant. The results from the study showed a similar relationship between the firm's age and growth that they followed inverse pattern which is was supported by Jovanovic's Passive Learning Model. For the testing of the Gibrat's Law, a similar inverse pattern was also found in the relationship between the firm's growths with its size. In all the

instances there was evidence to support Evans (1987) finding; which rejected the Gibrat's Law. The most recent study in South Africa was conducted in 2013, where panel data of businesses listed in the Johannesburg Stock Exchange was used, and the sales and revenue, total assets and employment were used as a measures of size. The study tested the Gibrat's Law using regression analysis, and tested whether the growth rates of large or small businesses where growing at the same rate at sector level. In general, the results rejected the Gibrat's Law at the sectorial level and showed that smaller businesses were growing faster than larger businesses (Dunne et al. 2013; McPherson 1996).

In conclusion, the implications of the literature are that most studies applying Gibrat's Law and Jovanovic's Passive Learning Model to determine the relationship of growth rates to other factors (i.e. size and age) of manufacturing businesses are old, but still applicable to testing the growth of manufacturing businesses in countries around the world. The aforementioned demonstrates the importance of applying these two models on manufacturing businesses in Gauteng and the Western Cape to determine if manufacturing SMMEs are growing at a faster or slower rate than larger manufacturing businesses from 2007 to 2013.

SECTION 3: METHODOLOGY

This empirical study followed a positivistic methodological approach to the study which applies that the Gibrat's Law and Jovanovic's Passive Learning Model will be used to determine if manufacturing SMMEs in the formal economy are growing at a faster rate in comparison to larger manufacturing businesses or vice versa in Gauteng and the Western Cape from 2007 to 2013. The measures of size of these businesses will be based on the number of employees and turnover variables.

The data on the number of employees for manufacturing SMMEs and larger manufacturing businesses for Gauteng and the Western Cape was sourced from the Quarterly Employment Survey (QES) that is conducted by Stats SA to collect information on employment from formal businesses on a quarterly basis, with the period chosen for this study being from 2007 to 2013. Formal businesses are regarded as those that are operating within the borders of South Africa and are registered for VAT with the South African Revenue Services (SARS). The turnover data was sourced from the Stats SA business register, containing information which include amongst others, the businesses legal name, unique identifier code, physical and postal address, VAT registration number, and turnover. Stats SA business register is a centralised database that contains data of businesses registered within South Africa, the data is sourced from the DTI, SARS and the Department of Labour (DoL).

A panel dataset constructed for this research, consist of only the businesses that survived in Gauteng and the Western Cape throughout the chosen period (2007 to 2013) and only those businesses with an employment rate above zero. This was done because Gibrat's Law and Jovanovic's Passive Learning Model uses natural logarithms to normalises the data points (of which a logarithm of zero does not exist). Gauteng and the Western Cape were chosen, because they contained the most manufacturing businesses in the QES dataset.

The variables to be used are form the QES panel dataset. The variables in the data include the business unique identifier, the collected number of employees, physical and postal address, and classification which is based on ISIC. The panel data was constructed by extracting only the manufacturing industry from the collected QES datasets from 2007 quarter 1 to 2013 quarter 4; and the employment for each business was annually averaged to obtain one value of employment per

year. The business unique identifier known as the enterprise number variable was used to merge the datasets into one panel dataset. The final panel dataset (after removing businesses that did not respond due to the reasons provided above) contained 1,106 and 410 manufacturing businesses in Gauteng and the Western Cape provinces, respectively.

The collected data from the QES does not contain the province and the age of the business variables. The province variable was derived using Stats SA postal code geography of 2005. The age of the business was derived from the businesses VAT registration number that was obtained from Stats SA business register.

The five equations that make up Gibrat's Law are stated in Table 3.1 with explanations. Gibrat's Law tests if the businesses growth rate is independent of its initial and the past size. Gibrat's Law is given by the equation (5), which will be tested using the panel unit root method; this is applied using the OLS regression method in testing if the requirements of the Gibrat's Law are met when studying the relationship between the logarithm of the firm sizes at the beginning period *(t)* and at the end of a period *(t-j)* (Aslan 2008). The use of OLS regression on the panel dataset was mainly because the OLS analysis always yields consistent estimators (Relander 2011), and OLS regression analysis mostly showed its capability of testing whether Gibrat's Law and Jovanovic's Passive Learning Model for all businesses without categorising the data into various size categories (Zoltan et al. 2009). Equation (5) which is the Gibrat's Law uses the natural logarithm, which normalises the data points to follow a normal distribution (Carrizosa 2006). Equation (5) shows that the dependent variable is given by the changes in the natural logarithmic growth rates between time *t* and *t-1*, which is predicted by the independent variables. The independent variables consist of the sum of the changes in the natural logarithmic growth rates within the panel dataset in use with its coefficient parameters, the intercept variable, and the error term. The intercept, coefficient parameters and the error term are estimated using OLS and assumed to be random variables and follow a normal distribution with mean zero and constant variance of σ^2 i.e. $N \approx (\mu = 0, \sigma^2)$ (Aslan 2008; Carrizosa 2006).

Jovanovic's Passive Learning Model, given by equation (6) is an extension to the Gibrat's Law (equation (5)), which introduces age parameter as an important factor into the Gibrat's Law equation (Aslan 2008). The age factor determines how experience gained over time can have an influence on the businesses growth processes, which implies regardless of age factor, the small and large businesses will grow at the same rate (Aslan 2008; Carrizosa 2006).

Table 3.1 Gibrat's Law and Jovanovic's Passive Learning Model equations

Equations to testing Gibrat's Law and Explanation of the Formula	
Equation 1	
$S_{i,t} - S_{i,t-1} = \varepsilon_{i,t} S_{i,t-1}$	The stochastic growth model of Gibrat's Law, assumes that the probability distribution of business growth rates is independent of its initial and its past size. $S_{i,t}$ is the size of a firm at time *t*, *i* is measured by either number of employees or its turnover, $S_{i,t-1}$ is firms size at time *t-1*, $\varepsilon_{i,t}$ is an error term and a random variable of $S_{i,t-1}$ that determines the businesses rowth rate between time *t* and *t-1*, and has normal distribution with mean of zero (i.e. $N \approx (\mu, \sigma_\varepsilon^2)$).
Equation 2	
$InS_{i,t} = \alpha + \beta InS_{i,t-1} + \varepsilon_{i,t}$	The equation (1) expressed as a natural logarithmic expression in order to normalize the data points. α is a constant intercept parameter affecting businesses growth. β is a constant coefficient parameter showing the impact of firm size on the firm growth. α, β ε are error terms and they are normally distributed with mean equal to zero and constant variance σ^2 ($N \approx iid(\mu = 0, \sigma^2)$)
Equation 3	
$InS_{i,t} - InS_{i,t-1} = \alpha + \beta_i InS_{i,t-1} - InS_{i,t-1} + \varepsilon_{i,t}$	In order to satisfy the assumption as stated by Gibrat's Law of independency when using OLS regression, natural logarithm of the previous size (InS_{it-1}) should be subtracted from equation (2).
Equation 4	
$\Delta InS_{i,t} = \alpha_i + \beta_1 InS_{i,t-1} + \varepsilon_{i,t}$	Equation (3) becomes equation (4), which is Gibrat's Law when using panel dataset with only two data points which is the current and the previous data points.

Continued Overleaf

Table 3.1 Continued

Equations to testing Gibrat's Law and Explanation of the Formula	
Equation 5	
$\Delta InS_{i,t} = \alpha_i + \sum_{j=1}^{p} \theta_{i,j} \Delta InS_{i,t-j} + \beta_i InS_{it-1} + \varepsilon_{it}$	Equation (4) becomes equation (5) which is the Gibrat's Law when using panel datas
Equation to test Jovanovic's Passive Learning Model **(an extension of equation 5 of Gibrat's Law)**	
Equation 6	
$\Delta InS_{i,t} = \alpha_i + \sum_{j=1}^{p} \theta_{i,j} \Delta InS_{i,t-j} + \beta_i InS_{it-1} + \psi_i A_{it} + \varepsilon_{it}$	Equation 6 shows the Jovanovic's Passive Learning Model where A_{it} is the age of a business *(i)* at time *(t)*.

The results from OLS when testing for both the Gibrat's Law (equation (5)) and the Jovanovic's Passive Learning Model (equation (6)), using the panel unit root will be satisfied only if $\beta_i = 0$. Both the tests will be rejected if β_i is negative ($\beta_i < 0$) or if β_i is positive ($\beta_i > 0$).

Gibrat's Law to be satisfied, this implies that the businesses within the dataset are growing the same rate regardless of size; and when rejected under the condition of β_i being negative ($\beta_i < 0$), this implies that smaller businesses grow at the faster rate than the large businesses; and if β_i is positive ($\beta_i > 0$) then this implies that larger firms grows faster than the smaller firms over time (Aslan 2008).

Testing for the Jovanovic's Passive Learning Model, which determines if the experience gained by the business over time i.e. age, has an influence on the growth rates of the businesses then the same condition are applied, but with a different interpretation. If $\beta_i = 0$ then the businesses growth rate is independent of age, that is regardless of age both small and large businesses will grow at the same rate. If β_i is negative ($\beta_i < 0$) then it implies that the smaller firms grow at a faster rate than the larger firms and experience does not have an influence on the firm's growth processes; and if β_i is positive ($\beta_i > 0$) then it implies that larger businesses grow faster than SMMEs and experience gained in the market does influences the businesses growth processes (Aslan 2008).

SECTION 4: DETERMINING THE MANUFACTURING SMMES CONTRIBUTION TO THE FORMAL SECTOR IN GAUTENG AND THE WESTERN CAPE: THE USE OF GIBRAT'S LAW AND JOVANOVIC'S PASSIVE LEARNING MODEL

This section present the results obtained from the construction of the QES panel data used to testing whether Gibrat's Law and the Jovanovic's Passive Learning Model is accepted or rejected, using the OLS regression analysis. Both the Gibrat's Law and the Jovanovic's Passive Learning Model were tested individually on Gauteng and Western Cape, using number of employees and turnover variables as measures of size; for the purpose of consistency the QES pane data will be regarded as the QES dataset. The first part of this section shows the distributions of the profiled manufacturing businesses (i.e. within the panel dataset) in Gauteng and the Western Cape; the second part will be the results from the OLS egression for both the Gauteng and the Western Cape.

4.1 PROFILING OF MANUFACTURING BUSINESSES IN GAUTENG AND THE WESTERN CAPE

The QES data consisted of only the manufacturing businesses that participated in the survey, only the businesses that survived throughout the chosen period, and had responded to the survey with positive employment information. Figure 4.1 shows the distribution by the province of manufacturing businesses on using of QES in the initial period (2007) and the end period (2013), and it is evident that Gauteng contain of large number of manufactures then followed by the Western Cape.
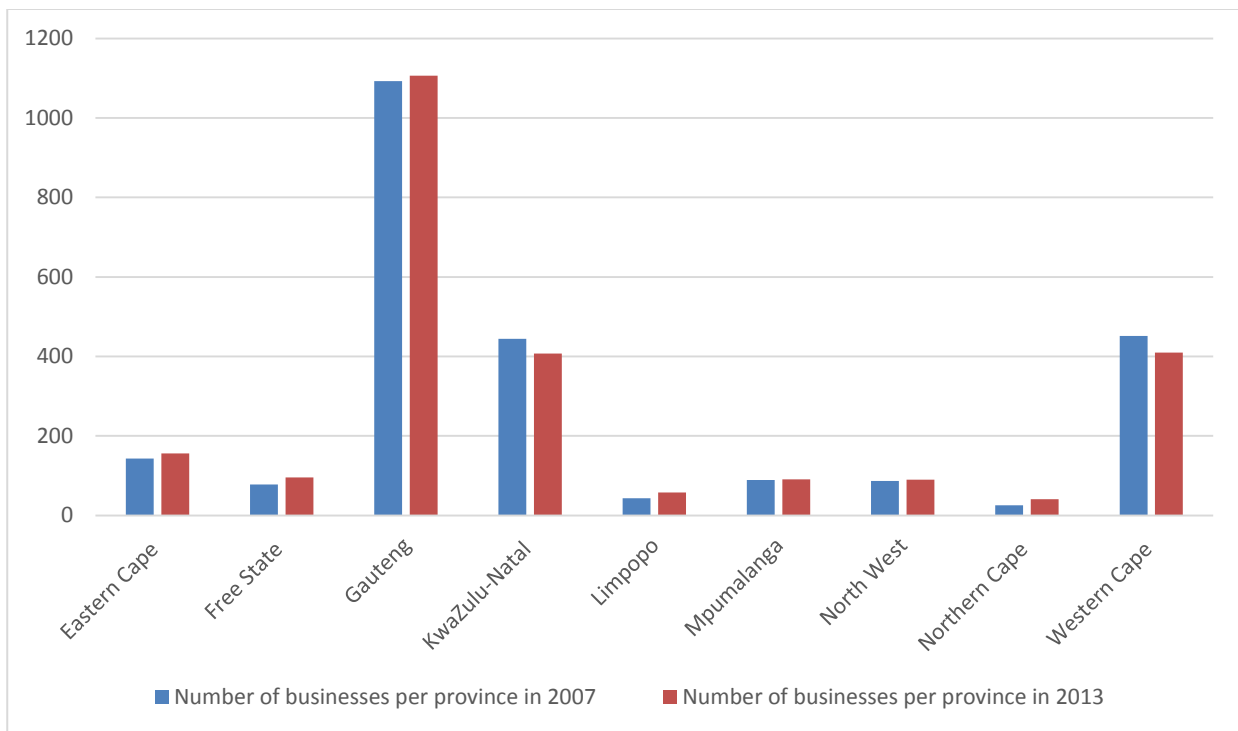
Figure 4.1 Manufacturing industry distribution in the QES dataset for both 2007 and 2013

Figure 4.2 shows the distribution of the businesses within the Gauteng and the Western Cape by size categories. It can be seen that the dominating number of businesses from both the provinces is the micro category i.e. very small businesses.
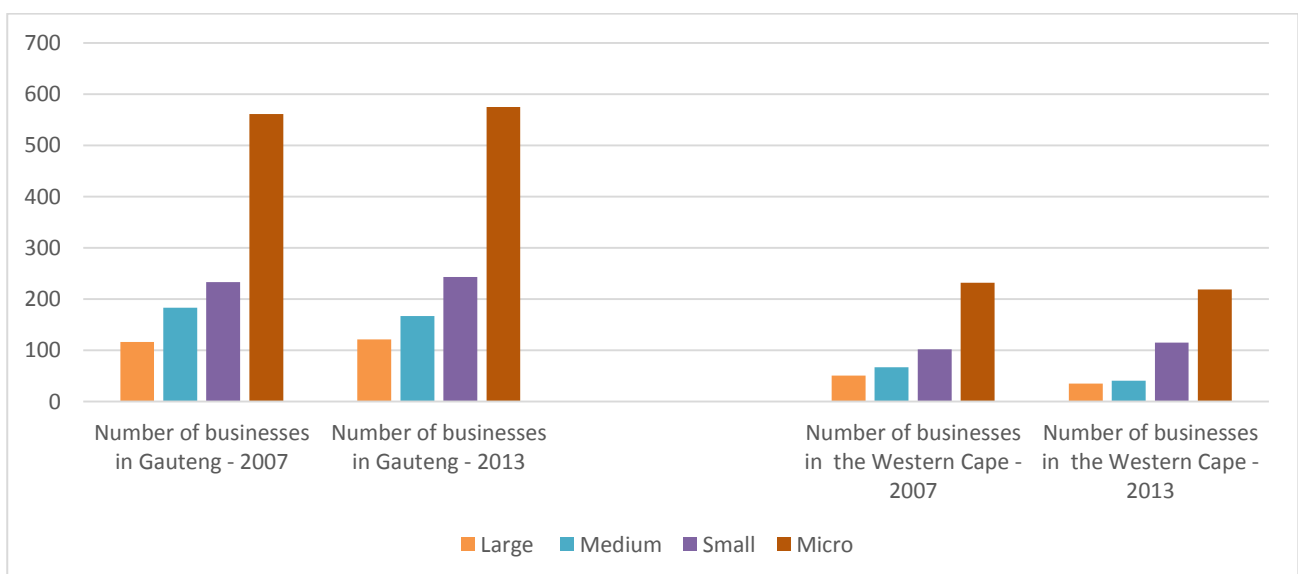

Figure 4.2 Distribution of large, medium, small and micro businesses in Gauteng and the Western Cape for both 2007 and 2013

4.2 CALCULATING GIBRAT'S LAW FOR GAUTENG AND THE WESTERN CAPE USING THE NUMBER OF EMPLOYEES AND THE TURNOVER

The test were performed for the Western Cape's manufacturing businesses using firstly the number of employees and secondly the turnover variables as measures of size, using the OLS regression method to calculate the parameters of the model. The models will assist in determine whether Gibrat's Law would be accepted ($\beta_i = 0$), which implies that manufacturing SMMEs and the lager businesses grow at the same rate, regardless of their size. Gibrat's Law is rejected if β_i is negative ($\beta_i < 0$) or if β_i is positive ($\beta_i > 0$); implying that the rate at which the SMMEs grow is not the same as the larger manufacturing businesses.

The number of observations used in testing Gibrat's Law on the manufacturing businesses in Gauteng is 1106. The results indicate that alpha (α) is -0.01671 when using the number of employees as a measure of size and -0.01559 when using the turnover as a measure of size. Furthermore, a beta value of $\beta_i = -0.00000170$ is obtained when using the number of employees as a measure of size, while a beta value of $\beta_i = +0.00000000000097$ is obtained when using the turnover as a measure of size (Table 4.1). Therefore, using the number of employees as a measure of size, the results indicate that manufacturing SMMEs grow faster than large manufacturing businesses, but the opposite is experienced when turnover is used as a measure of size, i.e. larger manufacturing businesses grow at a faster rate compared to the manufacturing SMMEs.

Testing Gibrat's Law for the Western Cape, Table 4.2 shows that the results followed the same trend as the Gauteng. Western Cape consisted of 410 number of the manufacturing businesses in the QES. The results indicate that the value of $\beta_i = -0.00001582$ when using the number of employees; and $\beta_i = +0.00000000000186247$ when using the turnover variable. This shows that the model was rejected, implying that when using number of employees as a measure of size, the manufacturing SMMEs in the Western Cape grow faster than the larger businesses; and the test results for turnover variable shows the opposite results implying the larger businesses grow at a faster rate than the manufacturing SMMEs.

Table 4.1 Testing Gibrat's Law on manufacturing businesses in Gauteng using the number of employees and turnover as a measure of size

Number of observations	Value of α - number of employees	Value of α - turnover	Independent variables	Values of the Coefficients parameters estimated – number of employees	Values of the Coefficients parameters estimated – turnover
1 106	-0.01671	-0.01559	Changes between 2011 and 2012	-0.00484	0.09575
			Changes between 2010 and 2011	0.03876	0.08084
			Changes between 2009 and 2010	0.02484	0.09600
			Changes between 2008 and 2009	0.03830	0.03627
			Changes between 2007 and 2008	0.06635	0.00075264
			Natural logarithm of number of employees in 2012	-0.00000170	0.0000000000097

Table 4.2 Testing Gibrat's Law on manufacturing businesses in the Western Cape using the number of employees and turnover as a measure of size

Number of observations	Value of α - number of employees	Value of α - turnover	Independent variables	Values of the Coefficients parameters estimated – number of employees	Values of the Coefficients parameters estimated – turnover
410	-0.02160	-0.02275	Changes between 2011 and 2012	-0.00479	0.05414
			Changes between 2010 and 2011	0.06315	0.12313
			Changes between 2009 and 2010	-0.01851	0.10474
			Changes between 2008 and 2009	-0.06506	0.02100
			Changes between 2007 and 2008	-0.11706	-0.02626
			Natural logarithm of number of employees in 2012	-0.00001582	0.00000000000187

4.3 CALCULATING JOVANOVIC'S PASSIVE LEARNING MODEL FOR GAUTENG AND THE WESTERN CAPE USING THE NUMBER OF EMPLOYEES AND TURNOVER VARIABLES

Jovanovic's Passive Learning Model was tested for both the Gauteng and the Western Cape. Table 4.3 shows the results for Gauteng province, which indicated that the values of beta being β_i= -0.000000504501 and β_i= +0.000000000000952 using the number of employees and turnover variables, respectively. In both instance the models were rejected but with different explanations; implying that the manufacturing SMMEs grow at the faster rate as compared to the large

businesses. Contrary to the results obtained when using number of employees as a measure of size, the turnover variable as the measure of size shows that the larger businesses tend to grow at faster rate as compared to the smaller businesses.

The results of the Western Cape were showed in Table 4.4. The results indicated that $\beta_i = -0.00001678$ and $\beta_i = +0.00000000000128$ using the number of employees and turnover variables, respectively. Again in this instance, the trend of the results is the same as the results from Gauteng; implying that the models were rejected with the same reasons.

Table 4.3 Testing for the Jovanovic's Passive Learning Model manufacturing businesses in Gauteng using the number of employees and turnover as a measures of size

Number of observations	Value of α - number of employees	Value of α - turnover	Independent variables	Values of the Coefficients parameters estimated – number of employees	Values of the Coefficients parameters estimated – turnover
1106	-0.01297	-0.01186	Changes between 2011 and 2012	-0.00437	0.10019
			Changes between 2010 and 2011	0.06357	0.10017
			Changes between 2009 and 2010	0.02764	0.11092
			Changes between 2008 and 2009	0.04025	0.04099
			Changes between 2007 and 2008	0.07131	0.00172
			Natural logarithm of number of employees in 2012	-0.000000504501	0.000000000000952
			Age	-0.00019118	-0.00016021

Table 4.4 Testing for the Jovanovic's Passive Learning Model manufacturing businesses in the Western Cape using the number of employees and turnover as a measures of size

Number of observations	Value of α - number of employees	Value of α - turnover	Independent variables	Values of the Coefficients parameters estimated – number of employees	Values of the Coefficients parameters estimated – turnover
410	-0.02838	-0.01506	Changes between 2011 and 2012	-0.00237	0.09178
			Changes between 2010 and 2011	0.05803	0.17156
			Changes between 2009 and 2010	-0.02000	0.11634
			Changes between 2008 and 2009	-0.07564	0.03150
			Changes between 2007 and 2008	-0.10576	-0.05213
			Natural logarithm of number of employees in 2012	-0.00001678	0.00000000000128
			Age	0.00019910	0.00015957

SECTION 5: DISCUSSION OF RESULTS AND CONCLUSIONS

The OLS regression analysis shows there are differences in the growth rates when using the number of employees and the turnover variables as measures of size. The test of the Gibrat's Law was conducted for both the Gauteng and the Western Cape; the results showed that when using the number of employees as a measure of size, the smaller businesses grow at the faster rate as compared to the large businesses. Contrary to the results obtained when using number of employees as a measure of size, the turnover variable as the measure of size shows that the larger businesses tend to grow at faster rate as compared to the smaller businesses. This is contributed to the inequalities of income and employment that exist within the developing countries, and South Africa is not immune to these challenges (NPC 2011). The results also confirms confirm that Gauteng and the Western Cape are one of the contributors to the national GDP which is based on growth of turnover data that is measured from monthly surveys (Office for National Statistics [ONS] 2013; Stats SA 2014d)); and also on the basis that both the Gauteng and the Western Cape contribute above the national average with rates to GDP (Stats SA 2013).

The test of the Jovanovic's Passive Learning Model showed similar results obtained when testing for the Gibrat's Law, meaning that the results shows that when using the number of employees as a measure of size, the smaller businesses grow faster than the larger businesses. This shows that including age (i.e. experience gained over the years) as an independent factor, it does not have an influence to the growth processes of the businesses. Contrary to the use of number of employees used as a measure of size, when using the turnover variable the results shows that larger businesses grow faster than the smaller businesses; this indicate that experience gained plays a vital role in the growth processes of business with regards to generating the businesses turnover.

The results of the Gibrat's Law and the Jovanovic's Passive Learning Model are consistent with the results obtained from the study by Harris and Trainor's (2005) where the panel unit root method was used to test Gibrat's Law using the UK manufacturing businesses (Nassar et al. 2013). The study by Heshmati (2001) using Swedish data also tested the Gibrat's Law using sales, assets and the number of employees as measure of size. The results showed similar pattern of results; confirming that when using number of employees as a measure of size the smaller businesses grow faster than the larger businesses; and the results showed that there was a positive relationship between businesses growth and its size when using sales and assets as a measure of size, indicating that the larger businesses grow at a faster rate than the SMMEs (Carrizosa 2006).

The policy implications is that the study is consistent with the proposed specifications in the NDP 2030 (NPC 2011) that stipulates that increased government support to SMMEs will create more employment opportunities in South Africa. This study also justifies the announcement of the newly created national Department of Small Business Development which is mandated to implement the strategies of White paper of Small Businesses (Parliamentary Monitoring Group 2014). The government of South Africa can also assist the SMMEs in benefiting from globalisation through exporting of their goods and services like the European Union (EU) has done is assisting their SMMEs (EU 2012). In the future, this study can be extended to include other sectors of the economy and other provinces. By expanding the scope of this study, government can be in a better position in understanding the provinces and the sectors that are in need. This can assist in prioritising of SMMEs based on relevant statistics and information.

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