UNDERSTANDING THE CONNECTION BETWEEN TOTAL EARLY-STAGE ENTREPRENEURIAL ACTIVITY RATE AND ENTREPRENEURIAL BEHAVIOR IN SOUTH AFRICA

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Abstract

While there has been debate among scholars regarding the issues facing policy makers in the field of entrepreneurship, it is widely acknowledged that this phenomenon contributes greatly to national productivity, growth, youth empowerment, and employment. Sophisticated estimation techniques, such as the total early-stage entrepreneurial activity (TESEA) rate, have become prominent in entrepreneurship development literature. This study investigates the impact of South Africa's TESEA rate on economic development, unemployment, prevailing macroeconomic conditions, the level of foreign direct investment, and periodic capital market adjustments. Various indices have been used to measure economic growth and national development, leading to distortions in estimates. Small and medium enterprises contribute about 36.1% of South Africa's GDP and employ approximately 68.2% of the workforce in the private sector, making it worthwhile to study entrepreneurial behavior and tendencies, while multinational enterprises have also helped to sustain growth and productivity. The economies of most developing nations have inefficient allocation and distributive frameworks leading to a vicious cycle of poverty that contrasts with the virtuous cycle of development that exists in developed markets. This paper proposes a multidisciplinary perspective to fill gaps in current literature and contribute to theoretical development in entrepreneurship studies.

Introduction

Profound differences in research synopses and viewpoints have caused schisms among entrepreneurship scholars during seminal debates. The prevailing argument concerns issues facing policy makers, such as the contribution of this phenomenon to national productivity, growth, youth empowerment, and employment. The Global Entrepreneurship Monitor (GEM) usage of sophisticated estimation techniques, such as the total early-stage

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entrepreneurial activity (TESEA) rate to measure entrepreneurial tendencies, has not only gained prominence in the small business (entrepreneurship) development literature (Álvarez, Urbano, & Amorós, 2014; Amorós & Bosma, 2014; Amorós, Bosma, & Jonathan, 2013; Bosma, 2013; Bosma et al., 2020; Herrington & Kew, 2018) but also offers insight into theoretical foundations that aids the solving of the global problem of poverty (Deakins & Freel, 2009; Hisrich & Peters, 2002; Nwafor, 2007).

Although emphasis has been put forward by the various entrepreneurship schools of thought, such as the Austrian school of thought, psychological characteristics school, and the socio-behaviorist school of thought, this field of study cannot obscure itself from conventional international business (IB) and economic theories despite conflicting ideological perspectives (Deakins & Freel, 2009). Since theories such as the resource-based view (RBV) stems from the logical argument that social capital affects important firm activities, which is also buttressed by the growth theory that emanates from the view that most enterprises grow organically from infancy to maturity, considering multidisciplinary perspectives has become a fundamental core of entrepreneurship literature. This can be traced to the fact that aggregate entrepreneurial activity is pro-cyclical due to a myriad of factors, which have not been thoroughly and aggregately studied thus far. Therefore, this article attempts to fill current literature and empirical gaps, contributing to theoretical development. More importantly, we investigate the impact of South Africa's TESEA rate on other economic ratios, such as the rate of economic development, unemployment, the prevailing macroeconomic conditions, the level of foreign direct investment (FDI), as well as its influence on periodic capital market adjustments (Acs & Szerb, 2011; Amorós et al., 2013; Bosma, 2013). Interestingly, there is a great rift in the methodology and approaches to measuring how entrepreneurship constitutes the building blocks of the economy of a nation (Acs & Szerb, 2011; Kew, Herrington, Litovsky, & Gale, 2013; Lin, Lu, Liu, & Zhang, 2016). Although numerous studies have continued to measure the rate of economic growth and national development (UNCTAD, 2015; World Economic Forum, 2015) using the GDP metric, different indices have been used to arrive at the same weight (i.e., product output, income, expenditure, and tax approaches), which also leads to some distortions in their estimates.

Since small and medium enterprises (SMEs) contribute about 36.1% of South Africa's GDP and employ approximately 68.2% of the workforce in the private sector (Smulders, 2006), studying entrepreneurial behavior and tendencies is worthwhile. More so, multinational enterprises (MEs), whose lifeblood is FDI, have also helped to sustain both national growth and productivity. Apart from the fact that MEs tilt the balance of payment positions of many nations, they also support ancillary industries and SMEs (UNCTAD, 2015; World Economic Forum, 2015). Moreover, due to the ingrained complexities of several developing nations' economies, most economists have deliberately studied this phenomenon in isolation, subsequently creating entirely new fields of study, such as development economics,[1] (Todaro & Smith, 2009), entrepreneurship, and small business development in contrast to international business that relies on the indices of very competitive economies. This is a result of almost perfectly competitive market information been freely and readily accessible in these countries, whereas the economies of developed nations have efficient allocation and distributive mechanisms. Most developing nations' markets have asymmetric information, which leads to an inefficient allocation and distributive framework that leads to a vicious cycle of poverty within the economy[2] (Dunning, 2010; Gerring & Thacker, 2008; Yusuf, 2009) as opposed to a virtuous cycle of development[3] (Dunning, 2010) that exists in developed markets. The rest of the paper is structured as follows: Section 2 reviews the relevant literature background and contains the hypothesis development that provides the motivation for this study; Sections 3 explains the empirical methodology; Section 4 presents the empirical results; and Section 5 focuses on the discussions and the conclusion of the study.

2. Background and Hypothesis Development

Contemporary entrepreneurship research reveals that entrepreneurship involves the replication of ideas, knowledge, skills/talent, and resources to generate an iterative conflation of products and services (Ansoff, 2006; Cope, 2005; Shane, 2013; Todaro, 2003). However, the growing significance of this phenomenon has led to various arguments that support different theories about this field (Deakins & Freel, 2012; Shane & Nicolaou, 2013). We therefore try to conceptualize the ensuing entrepreneurial chasm, and then empirically detect its determinant outcomes in South Africa. Given that entrepreneurial studies are both interdisciplinary and multifaceted as a result of the historical periods of economic progression and thought, different approaches to this topic have been theorized. Thus, each school of thought considers its theoretical foundations based on the roots of their thinking in economics, psychology, sociology, anthropology, management and international business (Dunning, 2010).

Based on the entrepreneurship literature review, this study places the schools of thought into four classifications, which include the economic approach, psychological characteristics (or entrepreneurial personality approach), the socio-behavioral approach, and the other models/tools that are based on direct influences from derived pragmatic representations from various fields of learning. Although different definitions of the term "entrepreneurship" have been put forward by various scholars, this research adopts the definition of Kirzner (1973), which defines entrepreneurship as *the act of business that encompasses the willingness to undertake risk, ignite innovation and manage resources (i.e., land, capital and labor) with the sole aim of ensuring profit or sustenance due to necessity, social impact and/or opportunity, because of the in-born peculiarities or the dynamic erudition routines of an erstwhile sub-optimal individual for the prosperity of an enterprise*. Expectedly, economic theorists and writers take the economic approach, since their opinions constitute the major findings of this entrepreneurship school of thought (see Table 1). Although classical economic theorists advanced the importance of free trade, division of labor, specialization and competition, objections have been raised because of their articulation of three modes of production, which are land, capital and labor. Hence, their failure to explain the dynamic disruption generated by the industrial age entrepreneurs caused a breakout in economic thought. Also, criticisms by the neoclassicists indicated that perfect competition carried closed system assumptions, such as pure exchange, that reflect an optimal ratio, which is not attainable in less developed and developing economies such as South Africa.

However, like the physiocrats who put forward the notion of a government of nature dominated by agrarian philosophy, which infers that the wealth of nations is derived exclusively from the rate of land development, their theoretical propositions were rejected and criticized by intellectuals. Nevertheless, it is noteworthy to understand that views held by Cantillon (1755) still hold sway today. For this reason, due to the influence of the three classes (i.e., landowners, workers and entrepreneurs), entrepreneurs remain fundamental economic agents who monopolize individual property rights to achieve profit or reward, as well as undertake risks that also lead to losses. Following this assumption, during the apartheid era in South Africa, the white minority controlled the land resources of the nation and became prosperous, whereas the majority of black people who dominated townships were poor and underemployed (Mthombeni, 2006; Mudhara, 2010) due to their inability to exploit the land resources of the country. Despite the fact that this anomaly is being corrected by the popular African National Congress (ANC) government through the Broad Based Black Economic Empowerment (BBBEE) programme (Akoojee, 2013), land ownership has not translated to economic prosperity for Africans. Likewise, many developed nations rely on their highly innovative enterprises instead of their land resources to ensure economic advancement and competitiveness over other nations.

Ultimately, the Austrian school of thought came into existence because they wanted to proffer remedies to the problems that emanated from earlier entrepreneurship schools of thought. This notion is based on the concept of methodological individualism, which assumes that social phenomena result from the motivations and actions of individuals because of subjective value, sub-optimality and a dynamic equilibrium where importance is given to the demand and supply of entrepreneurs whose effect is moderated by the expected reward. Remarkably, their view supports the notion that methodological individualism and subjectivism aid the manipulation of aggregate taste and preferences, opportunity costs, marginalism, as well as the time structure of cumulative production and consumption, which eventually causes all economic phenomena to occur over time. According to Kirzner (1973), an entrepreneur's creative alertness facilitates exchange and inspires him to spot opportunities (i.e., as a middleman) for trade by acting as an intermediary between suppliers and customers, despite not owning resources due to incomplete knowledge and costless marketplace information. This is what drives economies and is craved by all countries, including South Africa.

Table 1. Entrepreneurship schools of thought.

		Summary	Authors	Outcome
SCHOOLS OF THOUGHT	The Economic Approach	An offshoot of classical and neoclassical theories of economics, which is mainly influenced by the Austrian school of thought that market arbitrage gives rise to business opportunities.	Cantillon (1755) Say (1803) Knight (1921) Schumpeter (1934) Kirzner (1973) Shackle (1988) Casson (2010)	Dimensions: Micro (individuals), Context (nations and regions) and Time (annual assessment) — GEM TESEA Rate
	The psychological characteristics or entrepreneurial personality approach	Analyzes personality characteristics or traits of successful entrepreneurs or individuals based on entrepreneurial inclinations for risk-taking, innovation and tolerance for ambiguity.	McClelland (1961) Rotter (1966) De Vries (1977) Szpiro (1986) Landstrom (1998) Johnson (1990) Eisenhauer (1995) Cromie (2000) Coon (2004)	
	Socio-behavioral approach	This school argues that the social context, comprising of the society's culture, capital, learning abilities, risk management, and	Kolb (1984) Reynolds (1992) Costello (1996) Gibb (1997) Cope (2005)	

	environmental conditions, influences the extent of entrepreneurial participation, which is based on ethnic identification/segmentation and population ecology.	
Other international business strategy models or tools: Eclectic model Growth theory RBV-MBV Born Global SWOT-PEST	Merges several isolated theories into models by exploiting net ownership and locational and internalization advantages. It also understudies resources and market-based values that are firm-specific and location-bound, which rapidly globalizes SMEs.	Ansoff (1957) Ansoff (1979) Rostow (1960) Porter (1990) Rennie (1993) Wernerfelt (1995) Todaro (2003) Dunning (2010)

Murphy, Liao, and Welsch (2006) contend that entrepreneurialism generates a logic dynamic reality that Kirzner (1973) deciphered as consisting of three major conceptualizations: economic arbitrage, alertness to profit-making opportunities, and the distinction of ownership from entrepreneurship. Moreover, Shackle (1988) rationalizes that entrepreneurs are original, creative and imaginative when making choices. The GEM (Amorós & Bosma, 2014) explores this compelling gap by stating that nascent entrepreneurship can also be associated with pre-entrepreneurial involvement, such as education, employment, and learning experiences.

Furthermore, Casson (2010) concentrates on the synthesization process of the theories of entrepreneurship and entrepreneurial attributes and concepts, resulting in his notion that unique skillsets guarantee and distinguish the success of individual entrepreneurial endeavors, especially when making valid judgements that result in the coordination or reallocation of scarce resources. This, according to Casson, relies on the managerial attributes, financial capital and the personal wealth of entrepreneurs (Deakins & Freel, 2012). More so, Cassonians believe that active participation rates can also be based on the powerful influence of the environment, which moderates the relationship between the supply curve of entrepreneurs that is inversely related to the demand curve for entrepreneurs. Similarly, Casson and Casson (2013) suggest a dependence on the propensity of specific circumstances and control of production factors, as well as the recognition of the impact of social mobility and institutional factors as the foremost enablers of market equilibrium. This implies that South Africa's TESEA rate, entrepreneurial attitudes and behavior can be impacted by both demographic and institutional factors too.

Inadvertently, much controversy remains among scholars, policy makers and practitioners regarding the benefits that entrepreneurship creates. But the main criticism of the economic school of thought is that it assumes empiricisms can accurately articulate the current level of entrepreneurialism, which is consistent with the notion put forward by Austrian macroeconomics (i.e., it can be expressed in terms of microeconomic foundations). Based on current economic realities, the real issue is the growing problem with market and government failure. According to Murphy et al. (2006), market systems are not purely competitive and can involve antagonist cooperation, while resource monopolies can hinder competition and entrepreneurship. More so, it is critical to note that deception and controls (such as tax schemes) also contribute to market system activity, which can be counteractive. Correspondingly, entrepreneurship can occur in non-market social situations without competition in both private and state firms. Clearly, all things being equal, these factors can affect the attitude and behavior of entrepreneurs in South Africa.

Likewise, the psychological characteristics school of thought, or entrepreneurial personality approach, focuses on the traits of successful entrepreneurs using empirical data from pooled surveys that study the innate abilities of people with special talents that support the need for achievement and locus of control, which are associated with entrepreneurial inclination. McClelland (1961) affirmed the significance of this concept by identifying the proposed key competencies of successful entrepreneurs consisting of, but not limited by, factors such as proactivity, initiative, assertiveness and achievement orientation (i.e., the ability to see and act on opportunities, as well as commitment to others).

Many critics have challenged this theory because policy makers may divert intervention schemes to regions that have remarkably high rates of participation in small business ownership. According to Deakins and Freel (2009), this controversy has significant policy implications, since it might become obvious that some regions with low rates of participation may be excluded from government intervention programmes, although infrastructural and environmental interventions can assist in stimulating the level of entrepreneurial activity. Since enterprising individuals need entrepreneurial opportunities to succeed, the notion that was put forward by Reynolds, Hay, and Bygrave (2002) becomes sacrosanct. Individuals are motivated to engage in entrepreneurial endeavors due to either necessity (i.e., survival needs) or opportunity (i.e., satisfy their need for achievement). It has been observed that poverty or economic inequality tends to surge necessity-driven entrepreneurship rates at the discrete level (XavierOliveira, Laplume, & Pathak, 2015).

Perceptibly, the stable qualities that entrepreneurs show in most situations (Coon, 2004) are traits such as selfefficacy or confidence, risk-taking, creative tendency, optimism, emotionally resilience, transformational vision, tolerance for ambiguity, innovativeness, a strong desire for independence, being able to take charge of one's destiny, as well as non-conformist behavior. However, such measurement is not reliable because human behavior is not static but is dynamic depending on circumstances and environmental factors. That is why Rotter (1966) focuses on the locus of control orientation, depicting the consequences of entrepreneurial actions, which are contingent on what we do (i.e., internal control orientation) or on events outside our personal control (i.e., external control orientation).

Yet, the need for achievement ignites the passion to excel in individuals and also alters their entrepreneurial inclination. Many scholars have criticized this approach due to poor correlation and the fundamental inappropriateness to discern a specific trait that all entrepreneurs must possess. Besides, it ignores environmental factors, learning outcomes, the relevance of innovation clusters, as well as social networks (Chell, Haworth, & Brearley, 1991).

Over and above that, the socio-behavioral approach to entrepreneurship therefore relies on an alternate notion after appraising the remarks of critics of the entrepreneurial personality approach. From a sociological perspective, when studying an enterprise, the focus should be on the social context, which is why sociologists use the society as the level of analysis (Simpeh, 2011). Hence, this school argues that a society's culture and environment determines the extent of individual entrepreneurial participation levels, since it takes note of indicators such as the nation's tolerance of failure and risk, as well as how entrepreneurs are viewed by the society (Deakins & Freel, 2012). Moreover, in some countries or societies, the negative connotation of failure blacklists failed entrepreneurs due to bankruptcy laws instead of encouraging them to learn from their mistakes. According to Bosma et al. (2020), the GEM uses the TESEA rate to measure the participation rates in different nations and regions. Observably, Africans and women tend to have low participation rates, which, when probed, reveals a problem of inadequate and unequal access to opportunities due to barriers to employment, funds, risk averseness, low skills and the issue of poor linkages to existing social networks. Taken together, this causes individual entrepreneurial predisposition to be manifested by necessity, arising from the need to survive, since the general presumption is that MEs provide jobs and facilitate commerce, while considering the fact that consumption takes precedence over production in most less developed and developing economies due to a combination of factors, as well as their historical dependence on imports (UNCTAD, 2015; World Economic Forum, 2015).

According to Reynolds (1992), social networks are the most important social context that relate to entrepreneurial opportunity. This is because inter-organizational networks facilitate linkages that enable business development. Exemplar case studies can be typified by business cluster formation in Silicon Valley, South East Asia, Germany and some parts of Africa (Fox & Liebenthal, 2006; World Bank, 2011). It has been observed in these prior studies that efficient networks foster good communication between firms, which contributes to entrepreneurial behavior and success. In addition, there is a copious need to facilitate social exchange so that entrepreneurs can draw on resources that are available within social networks. Likewise, the role of social capital, as stated by Sirmon and Hitt (2003), affects important firm activities and acts as a glue that binds networks as a factor in determining entrepreneurial entry, especially when considering nascent entrepreneurship endeavors (Shapero & Sokol, 1982). Contemporaneously, Deakins and Freel (2009) suggest that "the nature of successful networks depends on the level of trust, which itself depends on the nature of the business environment (e.g., rural vs. urban) on culture and on regulations". However, the ability to learn remains a viable option that solves the problem of deficiencies in innate entrepreneurial traits. Consequently, entrepreneurial behavioral dynamism clarifies scholarly perspectives in this area, since it puts forward the idea that the intrinsic abilities of entrepreneurs cannot be static but are rather continually evolving (Fox & Liebenthal, 2006; World Bank, 2011). Interestingly, stakeholder interaction, as supported by the World Bank (2011) study, has greatly persuaded commentators to key into research reinforcing the empirical linkage between formal training and improved performance of small firms. More so, both the academe and institutional participants in industry have advocated mentorship-style assistance that solves real-life business problems as shown on television programmes such as "The Next CEO" – a reality television show that headhunts the next chief executive officer (CEO) based on real-life business problems through task performance, goal setting and the ingenious courage of the executive. Based on this initiative, several companies have been able to solve succession issues via the attraction and/or retention of skilled (i.e., top talent) in an organization.

Matter-of-factly, entrepreneurs learn from mistakes, experience and networks, retrospectively and prospectively, through a reflection of events that result from entrepreneurial outcomes. Thus, in order to examine fundamental

business concerns/problems, as well as determine reasons why these issues arise, an action learning process needs to be put in place to identify and analyze market problems so that it can ultimately lead to practical outcomes (Cope, 2005). Since entrepreneurs take risks due to their profit maximization motive, considerable learning effort can assist in improving the production process of their companies through inputs selection, supplier cataloguing and marketing (Deakins & Freel, 2012), thereby minimizing the level of uncertainty. We posit that through an operational scaling process that takes cognizance of the environment, competitors, business weaknesses, opportunities and threats, businesses can upscale and increase their returns (Deakins & Freel, 2009, 2012; Zhang, Macpherson, & Jones, 2006).

Furthermore, Reynolds (1992) asserts that life course stage, ethnic identification and population ecology can have an impact on the survival of a business and/or entrepreneurs. This is because the experience of people from various sociological backgrounds spurred by environmental factors (such as the political system, government legislation, per capita income, fiscal and monetary policy, as well as customers, employees and competition) can be the decisive factors that ensure that entrepreneurs either flourish or collapse in their businesses operations (Fox & Liebenthal, 2006; World Bank, 2011).

Regardless of the volume of literature on a particular area of study, most times scholars still borrow theories from other fields of research because the theoretical or practical understanding of a subject is not an isolated phenomenon that is fully understood. Remarkably, entrepreneurship literature has painstakingly applied other models, theories or tools that emanate from both the IB and strategy literature. For instance, the resource-based view (RBV) of firms supports the notion that firms exist due to the unique embedded heterogeneous resources and capabilities that cannot be possessed, imitated or built up in a similar manner by competitors (Barney, 2001; Kozlenkova, Samaha, & Palmatier, 2014; Ludwig & Pemberton, 2011; Rugman & Verbeke, 2002; Rugman, Verbeke, & Nguyen, 2011). As an eye opener, the suppositions of the RBV theoretical model have been reinforced by Schumpeterian contention that the level of innovation and technological change of a nation come from the entrepreneurs.

However, linking entrepreneurship and IB theory is a very taxing process due to the problem of demographic population heterogeneity (Milne, 2008; Rostow, 1960). Since global commonalities (i.e., ocean and air) can be shared by all countries of the world, each country can follow the path to sustainable economic growth and development (UNCTAD, 2015; World Economic Forum, 2015) if every nation makes conditions feasible for a global factory (which allows MEs to take advantage of existing price differentials) through a deliberate pact that allows entrepreneurship to thrive via the exploitation of a country's absorptive capacity for the utilization of FDI. Various growth theories have espoused the reality of an aggregate production function, whose existence and properties are closely tied to the assumption of an optimal resource allocation within each economy (Banerjee & Duflo, 2004).

That said, in a similar vein, the eclectic paradigm utilizes the ownership, locational and internalization (i.e., OLI model) advantages as applicable in internalization theory to explain how cost advantages aid entrepreneurial progress (Dunning, 2010). Thus, this theory emphasizes the importance of entrepreneurial skills, trademarks, production techniques and returns to scale by stating location-bound firm-specific advantages (FSAs), such as the existence of raw materials, rightly priced skilled labor, and tax legislation influence on the market potentials, which ultimately leads to the exploitation of core competencies that can lead to various forms of market entry or exit. Apparently, this explains why some entrepreneurs are opportunity-, survival- or necessity-driven (Acs & Szerb, 2011; Amorós & Bosma, 2014; Amorós et al., 2013; Bosma, 2013; Bosma et al., 2020; Deakins & Freel, 2012; Herrington & Kew, 2018; Shane & Nicolaou, 2013). Accordingly, Rostow's economic growth theory

attempts to fill the gap in extant literature by stating that all countries exist somewhere in his linear spectrum and could climb upward through each stage in the development process (Rostow, 1960). His deconstruction procedure specified five stages of economic growth, whereby a nation can move from a traditional society (i.e., largely agrarian and barter dependent) to the transitional stage (that meets the pre-conditions for economic take-off, such as a rapidly growing infrastructure that leads to production surpluses and specialization), and then to the take-off stage (which incites industrialization characterized by growing investment and regional growth, as well as a stable democratic system), which moves upward toward the drive to maturity (that inspires diversification, innovation, non-reliance on imports, and rising investment levels), and finally to the age of high mass consumption (which is consumer-oriented, service sector dependent, and encourages the production of high tech goods). Based on this classification, South Africa is located somewhere across this spectrum, hence, it can also impact entrepreneurial tendencies, attitudes and behavior.

Despite the importance of Rostow's theory, many critics have noted that first world economic realities cannot be used as a yardstick to measure third world countries, whose reliance on agriculture and the extractive industries, makes them prone to economic disturbances due to the misallocation of optimal resources, as well as the heterogeneity of rates of return (Milne, 2008). Also, the rapid development of the prominently communist and undemocratic Asian Tiger countries, such as China, led to Rostow's argument failing. Although, in entrepreneurship literature, the movement of nations from factor-driven economies toward efficiency-driven economies and then to innovation-driven economies (Amorós & Bosma, 2014) simplifies the applicability of this notion, more studies need to be carried out in order to provide an efficient classification framework that can be appropriate for all countries.

Research on neoclassical economics have put forward notions that portray economic growth as being influenced in the long run by the exogenous effects (i.e., external forces) of the savings rate (using the Harrod–Domar model) and outcomes of the rate of technical progress (using the Solow model), or the endogenous factors (i.e., internal forces), which, according to the AK model, assumes that policy measures, such as investment and subsidies in human capital development, innovation, and knowledge, create positive externalities and spillover effects that deepen the level of economic growth (Acemoglu, 2009; Barro & Sala-i-Martin, 2004; Romer, 2011). Therefore, research and development (R&D) can cause firms to be become monopolistic, as well as restrict free entry into these markets, as a result of the high costs associated with inimitable technological innovations.

In addition, contemporary entrepreneurship theory reconciles with strategic management, IB and economic theory through the application of theories that support the notion that entrepreneurs are the driving force of the whole economic system (Dunning, 2010; Todaro, 2003; Wernerfelt, 1995). Consequently, the market-based view (MBV) uses an objective exogenous approach to explain how sustainable competitive advantage can be gained through astute market positioning through the use of Porter's five forces that take cognizance of the product life cycle of a firm's products and services. On the contrary, the resource-based view (RBV) uses an endogenous approach through a subjective value chain analysis and product matrix to identify valuable tangible or intangible resources at a firm's disposal, which are heterogeneous in nature, immobile, valuable, rare, inimitable, and substitutable (Kozlenkova et al., 2014; Ludwig & Pemberton, 2011). According to Lakew (2015), global firms have a global orientation from the onset; as such, this concept debunks Rostow's stages of economic growth theory. Correspondingly, empirical evidence from a study carried out by Bosma and Levie (2010) suggests that more than half the population sample of entrepreneurs in advanced economies, and around a third in developing countries, go into business with plans to attract FDI from overseas. In a like manner, born global firms internationalize at a rapid pace – usually within three years or less between the initial domestic establishment of

the firm and its first entry overseas (Senik, 2010). Predictably, SMEs that are typically knowledge intensive, high tech driven and niche market oriented, can key into an accelerated internationalization (Gabrielsson, Kirpalani, Dimitratos, Solberg, & Zucchella, 2008) by taking advantage of global networks which are facilitated by a borderless marketplace, global sourcing and rising demand for quality products and services (Lakew, 2015; Senik, 2010).

Likewise, modern entrepreneurship literature utilizes the political, economic, social, technological, legal and environmental (PEST-LE) analysis tools to determine the features of a market from a bird's eye view to ascertain specific trends and indices that are exogenous when considering the macroeconomic perspective of the rate of economic growth and development in a nation. Contrariwise, an endogenous perspective of the internal environment considers the strength, weaknesses, opportunities and threats (SWOT) analysis in examining products and services that are firm-specific (Davis, 2013; Konopik & Lindgren, 2010). Taken together, it has been observed that aggregate entrepreneurial activity is pro-cyclical and can result in a contemporaneous shift in economic activity (Deakins & Freel, 2009).

According to Smith-Hunter and Boyd (2004), Weber's Disadvantage Theory contends that those who exit the mainstream economy as a result of discrimination turn to business ownership as an alternative to the labor market. This explains the reason for the existence of ethnic entrepreneurship and copreneurs, i.e., female co-owned organizations (Hisrich & Peters, 2002). It has been observed that most black (BBBEE) entrepreneurs are overtly positive about starting a business despite being risk averse and predominantly low skilled; therefore, their active participation in the entrepreneurship ecosystem compounds the high failure rate in South Africa (Akoojee, 2013; Nwafor, 2007).
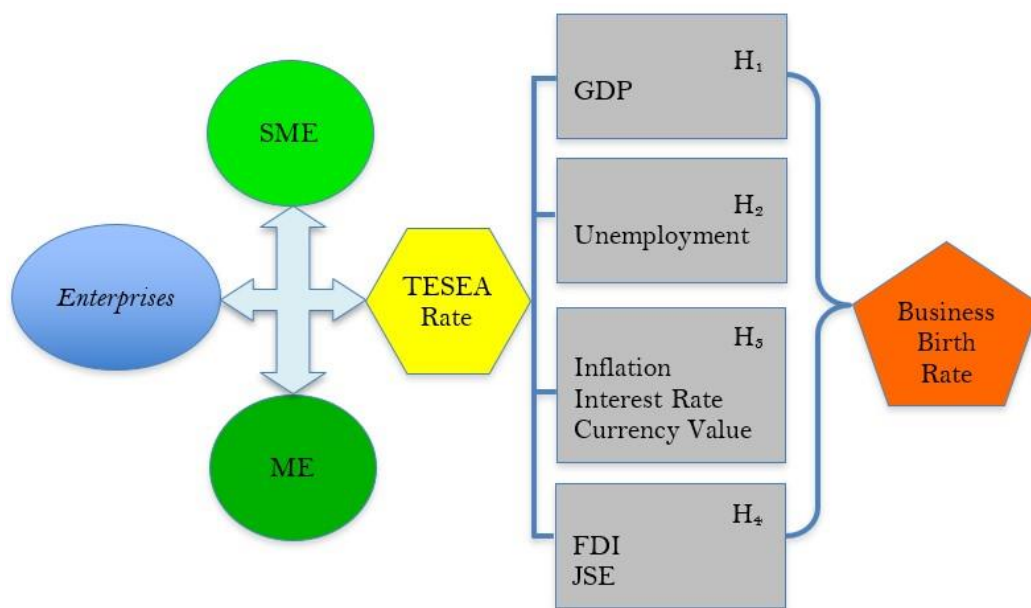
Figure 1. Conceptual model of the study.

Due to the dynamic complementarity between MEs and SMEs the GEM report replicates the model used in the Global Competitiveness Report that is published by the World Economic Forum. Relatedly, the level of entrepreneurial activity is determined by entrepreneurial opportunity and capacity, considering indices such as demography, education, economic infrastructure and culture (Acs & Szerb, 2011; Amorós & Bosma, 2014; Amorós et al., 2013; Bosma, 2013; Deakins & Freel, 2012; Shane & Nicolaou, 2013). Furthermore, the GEM report measures differences in the level of entrepreneurship activity between economies, in the process determine

national levels of entrepreneurial activity, as well as identify factors that enhance entrepreneurial activity worldwide (Amorós & Bosma, 2014).

Using these theoretical lenses of entrepreneurship theory, we develop a conceptual framework and also put forward various hypotheses focusing on the influence of the GEM's TESEA rate on entrepreneurship attitudes and behavior in South Africa. This framework is depicted in Figure 1. Explicitly, the TESEA rate uses the individual survey data relating to the process of starting a business, as well as the opinion of those running new businesses that are less than 3½ years old in a country. Amorós et al. (2013); Bosma (2013); Shane and Nicolaou (2013) and Amorós and Bosma (2014) revealed that, as a percentage of the adult population, these rates tend to be highest for the factordriven economies and decline with increasing levels of GDP. According to Herrington, Kew, and Kew (2014), "South Africa's rate of entrepreneurial activity is very low for a developing nation – a mere quarter of that seen in other subSaharan African countries. More so, entrepreneurial activity in South Africa, although very low, has increased marginally over the last 10 years".

Based on this conceptual framework, we develop a generalized linear model and derive formal propositions thereafter. We describe the model and salient intuition behind the propositions here, while detailed econometric derivation and supporting arguments are explicated fully in the empirical investigation section of this study. Following prior work by Amorós and Bosma (2014), the following propositions and hypotheses are deduced.

2.1. The TESEA Rate and the Rate of Economic Development in South Africa

The GEM conceptual framework (Herrington et al., 2014) lists macroeconomic stability as one of the basic requirements that influences the entrepreneurial profile (i.e., attitudes such as perceived opportunities and capabilities, fear of failure, and status of entrepreneurship, as well as activities that embody opportunity/necessitydriven motives, early-stage start-ups, inclusiveness, industry, the exit of underperforming companies, and aspirations for growth, innovation, international orientation and social value creation). More so, the national framework conditions are based on the World Economic Forum (2015) Global Competitiveness Report.

According to Bosma et al. (2020), the GEM project remains dedicated to its vision of consolidating evidence that reveals the significance of entrepreneurship to national economic growth, innovation and job creation. Consequently, the GEM conceptual framework reflects the complexity of the causal relationships between entrepreneurship and macroeconomic development globally. However, potentially ambitious entrepreneurs react differently to different political, economic, social, environmental, technological, regulatory and legal regimes than those who are less ambitious (Bosma et al., 2020; Bosma & Levie, 2010; Herrington & Kew, 2018).

Based on our conceptualization of contemporary entrepreneurship literature, we examine the effects that the rate of economic development in South Africa has on the country's TESEA rate. However, consistent with entrepreneurship theorists (Acs & Szerb, 2011; Amorós & Bosma, 2014; Amorós et al., 2013; Bosma, 2013; Deakins & Freel, 2012; Shane & Nicolaou, 2013) who highlighted the influence and impact of institutional factors, such as the degree of economic freedom and the ease of doing business on the rate of economic development, we suggest that when these constructs are considered together, a reliable and robust analysis can be conducted that leads to findings that can be generalizable.

The World Bank (2016) posits that creating a regulatory environment that empowers free enterprises (e.g., SMEs) creates a positive impact on job creation, which is good for the economy. It measures the ease of doing business, which is determined by sorting the aggregate distance to frontier scores on ten relevant topics. Furthermore, the indicator takes cognizance of the procedures, time, cost and minimum capital outlay to start a new business, as well as gauging the level of entrepreneurial activity. Essentially, the use of this metric is based on an exploration

of the sources of enduring economic dynamism and how they relate to each other in ensuring opportunities for the greatest number of people. Likewise, the Economic Freedom of the World (EFW) index (Fraser Institute, 2016) is based on the fact that basic institutions that protect the liberty of individuals to pursue their own economic interests result in greater prosperity for the broader society. Therefore, the EFW index measures the degree to which the policies and institutions of countries are supportive of economic freedom. It uses data from the World Bank, the International Monetary Fund (IMF), Economist Intelligence Unit (EIU) and Transparency International to score various nations on different macroeconomic frontiers.

Given that the South African TESEA rate declined by 34% in 2014, while the same trend was noticed in both the ease of doing business and the rate of economic freedom ranking, this indicator points to a possible link between these phenomena (Fraser Institute, 2016; Heritage Foundation, 2016; Herrington et al., 2014; World Bank, 2016). In line with entrepreneurship theory, we contend that a positive relationship occurs between the TESEA rate and the rate of economic development in South Africa, but since this relationship cannot exist in isolation, it is mediated by institutional factors, such as the degree of economic freedom and the ease of doing business. Thus, the following is proposed:

Hypothesis 1: The relationship between the TESEA rate and the rate of economic development in South Africa is influenced and impacted by institutional factors, such as the rate of economic freedom and the ease of doing business.

2.2. The TESEA Rate and the Rate of Unemployment

As noted earlier, entrepreneurship opens up opportunities for jobs to be created in an economy, which implies that many unproductive members of society can be lifted out of poverty (Fox & Liebenthal, 2006), which will simultaneously reduce the level of crime in the country (Deakins & Freel, 2009). According to Herrington et al. (2014), the problem of the youth unemployment level, which is in excess of 60%, remains a mounting challenge for the government. It appears that this rising figure could trigger the total unemployment rate in South Africa to rise above current levels of about 25%, which is higher than any other country in Sub-Saharan Africa. However, despite this trend, South Africa's TESEA level has declined by 34%, from 10.6% in 2013 to 7.0% in 2014.

A recent report by Statistics South Africa (2015) reveals that one in four, or about 15.7 million, South Africans are employed, while about 5.2 million are unemployed. Consequently, social tensions continue unabated, despite improvements in the employment of black and skilled people. Basically, a conscientious effort by the ANC government has set a high target of cutting the unemployment rate to about 6% by 2030 through entrepreneurial education, training and innovation. A study carried out by Herrington and Kelley (2012) posits that the pernicious effect of poverty and unemployment may be addressed through entrepreneurial activity, and while entrepreneurship may not be a panacea, it certainly forms part of the solution to this contagious phenomenon.

The aftermaths of the 2008/2009 global recession and the coronavirus pandemic (UNCTAD, 2015; World Economic Forum, 2015) imply that an upsurge in necessity-driven entrepreneurship (at least in the short-term) can significantly ameliorate the unemployment problem in South Africa. Consistent with the findings of entrepreneurship theorists (Acs & Szerb, 2011; Amorós & Bosma, 2014; Deakins & Freel, 2012; Lakew, 2015; Senik, 2010) who emphasized the importance of entrepreneurship as a source of wealth and job creation, we contend that a positive relationship occurs between the TESEA rate and the rate of unemployment in South Africa. Therefore, we predict that:

Hypothesis 2: The TESEA rate is positively associated with the rate of unemployment in South Africa.

2.3. The TESEA Rate and Prevailing Economic Conditions/Policy

Based on contemporary entrepreneurship literature, the TESEA rate can be influenced by the prevailing economic conditions. Moreover, these macroeconomic conditions are regulated by various monetary and fiscal policy measures that are being put in place by the government (Amorós & Bosma, 2014). In Africa, the most problematic factors when starting or running business ventures are high levels of corruption, access to finance (which is moderated by the interest rate), foreign currency regulations and the level of inflation (World Bank, 2011). Also, prohibitive rates of interest and exchange rates can also trigger inflationary pressures on goods and services, thus reducing the aggregate purchasing power of individuals, SMEs, MEs and government. This is why Schumpeter's notion of creative destruction gives credence to how inefficiency and a fundamental lack of innovation causes the closure of unproductive firms due to the entry of more innovative new firms (Casson, 2010; Deakins & Freel, 2012; Schumpeter, 1934).

The misallocation of capital causes sub-optimal usage of resources and capabilities, which perhaps can be exogenously linked to market disequilibrium (Milne, 2008). As a result, this precarious situation causes the demand and supply of entrepreneurs to shift until an equilibrium level is reached. According to Kerr and Nanda (2009), this issue may preclude high-quality entrepreneurs with good ideas from entering the market since they are unable to access adequate capital to either start up a new business or expand an existing firm, given the aforementioned negating factors.

Smithin (2001) posits that cheap money policy (i.e., lower real rates of interest) tends to increase both the growth rate as well as the share of entrepreneurial profits. Furthermore, the continuing distortion in oil and commodities prices indicates that a recession is imminent. Expectedly, this may give rise to sordid business practices in order to shore up the level of big business (UNCTAD, 2015). Nevertheless, global indices reveal that this grim analysis can trigger entrepreneurial activities in new areas, such that individuals and SMEs can capitalize on the current gaps in the market, given the turbulent business climate (Amorós & Bosma, 2014; Herrington et al., 2014; World Economic Forum, 2015).

On the flip side, the South African government's monetary policy involves increasing the interest rate (i.e., making loans more profitable for banks, thus positively impacting commercial credit), lowering the strength of the rand against major currencies in the world, hence influencing the broad money[4] supply. It is expected that the implementation of this policy would lead to lower aggregate domestic demand and more exports (Statistics South Africa, 2015). Equally, the fiscal policy of the government ensures that tax rates are raised and that the government cuts spending so that a smaller budget deficit can be achieved, given the existing problems of current account deficit. However, despite these policies, the South African government has not been able to keep the inflation rate steady (Fairlie, 2011; Herrington et al., 2014; World Economic Forum, 2015).

According to Fairlie (2011), a slack labor market and economic conditions triggered by a recession are key determinants of business creation, such that higher local unemployment rates are found to increase the probability that individuals will start businesses. Similarly, Fernández-Villaverde (2010) suggests that inflation increases the wealth of entrepreneurs and moderates the finance premium on SME loans that are secured from financial intermediaries, hence minimizing the crowding out of private ventures by government spending (Svensson, 2010; Woodford, 2012). Comparatively, drops in tax rates positively affect labor, while returns on deposits lower the inflation rate. Consequently, the impact of these indicators on entrepreneurship can be inversely proportional to the outcomes anticipated due to increments in government expenditure (Herrington et al., 2014).

Consistent with theorists (Casson, 2010; Deakins & Freel, 2012; Fairlie, 2011; Fernández-Villaverde, 2010; Herrington et al., 2014; Kerr & Nanda, 2009; Milne, 2008; Smithin, 2001; Svensson, 2010; Woodford, 2012)

who underscored the significance of entrepreneurial tendencies and attitudes based on the prevailing economic conditions, we suggest that a relationship occurs between the TESEA rate and monetary/fiscal policy. Hence, we expect that: *Hypothesis 3: The relationship between the TESEA rate and the rate of economic development in South Africa can be positively attributed to the prevailing economic conditions as well as monetary and fiscal policies, such as interest and tax rate setting, inflation targeting, and currency valuation.*

2.4. The TESEA Rate and Macroeconomic Conditions (FDI/JSE Market Capitalization)

The latest developments in FDI attraction, as well as global entrepreneurship tendencies and policies, indicate that youth entrepreneurship schemes can be used as a strategy to achieve sustainable and inclusive growth in less developed (factor-driven and efficiency-driven) economies (Zhan, 2014), thus Fahed (2013) suggests that entrepreneurship has a significant effect on FDI. Given that the rates of FDI inflows and outflows can be determined by the strengths or weaknesses of local entrepreneurship conditions in designated host locations, it is expected that SME promotion can accelerate economic growth in South Africa. Since the ease of doing business and the degree of economic freedom focuses on strong institutional foundations, such as an efficient capital allocation system and the protection of property rights, strong institutions certainly allow local SMEs to thrive, and vice versa (Banerjee & Duflo, 2004; Dunning, 2010; Gerring & Thacker, 2008; Milne, 2008; Todaro & Smith, 2009; Yusuf, 2009).

The research findings of Albulescu and Tămăşilă (2014) reveal that inward FDI positively influences opportunity-driven entrepreneurship, while outward FDI has a positive influence on necessity-driven entrepreneurship and a negative impact on other categories of entrepreneurs. This conclusion is based on the positive spillover effects of ME transfers, while the negative spillover effects are the barriers of entry that is spearheaded by the high costs of R&D. Correspondingly, Ayyagari and Kosová (2006) found evidence that points to the fact that the significance of backward linkages (i.e., horizontal less competitive entry spillovers in the upstream sector) and forward linkages (i.e., vertical competitive entry spillovers in the downstream sector) might imply that these trends vary across industry dynamics.

Although the Johannesburg Stock Exchange's (JSE's) market capitalization broadly affects the direction of the South African economy, it has been observed that the global competitive environment greatly affects the scale of such change, and that entrepreneurial and small business activities help to act as a cushion against detrimental factors resulting from the interaction of local businesses with foreign markets (Eurofound, 2012; Office of the Director of National Intelligence, 2013; Qaqaya & Lipimile, 2008). A study carried out by Stanlib (2015) indicates that the exchange is successfully fulfilling its main function (i.e., the raising of primary capital) by rechanneling cash resources into productive economic activity, thus building the nation's economy while synchronously enhancing job opportunities and wealth creation.

This line of argument is supported by various theorists, such as Banerjee and Duflo (2004); Ayyagari and Kosová (2006); Gerring and Thacker (2008); Milne (2008); Qaqaya and Lipimile (2008); Todaro and Smith (2009); Yusuf (2009); Dunning (2010); Eurofound (2012); Fahed (2013); Office of the Director of National Intelligence (2013); Albulescu and Tămăşilă (2014); and Zhan (2014). Stanlib (2015) predicted that the TESEA rate can be influenced by the prevailing macroeconomic conditions, which is consistent with the preceding hypotheses that the TESEA rate can be influenced and impacted by institutional factors, the rate of unemployment in South Africa, as well as the prevailing monetary and fiscal policies. We suggest that a relationship occurs between the TESEA rate and the levels of FDI inflow and outflow in South Africa, as well as the total JSE market capitalization. Hence, we envisage that: *Hypothesis 4: The varying relationship exemplified by the TESEA rate*

in South Africa can be influenced and mediated by the macroeconomic conditions that are associated with the level of FDI and the total market capitalization of the JSE.

3. Empirical Investigation

We test the predictions of our model using a data sample of the national TESEA rate, as well as other relevant macroeconomic variables during the 2003–2014 period. Since the observations of South African entrepreneurial behavior is estimated by the TESEA rate, other variables were used as a reference against which the sensitivity of entrepreneurs to various macroeconomic conditions in their quest to start or expand their businesses was measured. The dataset elements and the diverse sources from which they are aggregated are described below.

3.1. GEM Data

The primary source of entrepreneurship statistics used in this study is the GEM database. It provides primary data on entrepreneurship, including aspects such as the harmonized measures about the attitudes, activities and characteristics of individuals who participate in the various levels of entrepreneurship, which are widely used in academic research (Amorós & Bosma, 2014; Amorós et al., 2013; Bosma, 2013; Deakins & Freel, 2012; Shane & Nicolaou, 2013). From the GEM data, information was obtained on 11 variables – the total early-stage entrepreneurial activity (TESEA) rate coded as *TESEArate*, the start-up (or nascent entrepreneurship) rate coded as *Startupr*, the new firm (or business ownership) rate coded as *Newfirmr*, the opportunity rate coded as *Opportunityr*, the necessity rate coded as *Necessityr*, entrepreneurial intentions coded as *Entri*, good career choice coded as *Goodcc*, the high status of successful entrepreneurs coded as *Highs*, media attention for entrepreneurship coded as *Mediaa*, female TESEA rate coded as *FemaleTESEAr*, and male TESEA rate coded as *MaleTESEAr*. The annual data collected was used to estimate the yearly impact of these variables' measurements from 2003–2014; however, average values were manually computed when data for a given year is missing.

3.2. WDI Data

The world development indicators (WDIs), which are provided by the World Bank, contains data on over 1,420 major macroeconomic indicators covering statistics from all the countries of the world. The WDI has been consistently used in various studies relating to the levels of poverty, entrepreneurship, national growth and development by researchers, private institutions, supranational bodies and governments (Fraser Institute, 2016; Heritage Foundation, 2016; Herrington et al., 2014; World Bank, 2016). From the WDI data, information was obtained on 14 variables, such as GDP, which represents the total value of goods produced and services provided in South Africa in one year. In order to compensate for measurement inaccuracies, we used four types of GDP indicators so that our statistical estimation is not biased. We followed this methodological procedure based on evidence from similar studies. The GDP at market prices in current US$ is coded as *GDPcp*, while the GDP real growth rate expressed as annual per cent is coded as *GDPgr*. Also, the GDP purchasing power parity expressed in constant 2011 international dollar prices ($) is coded as *GDPppp*, and the GDP per capita in current US$ is coded as *GDPpc*. Furthermore, the total unemployment rate expressed as a percentage of the total labor force is coded as *Unempr*, the male unemployment rate expressed as a percentage of the male labor force is coded as *Unemprmale*, and the female unemployment rate expressed as a percentage of the female labor force is coded as *Unemprfemale* (however, the national estimate is based on data provided by Statistics South Africa). Similarly, the real lending interest rate expressed in percentage is coded as *Intr*, while the inflation rate percentage in terms of consumer prices is coded as *Infr*. The official exchange rate based on the periodic average of the local currency unit (LCU) per US$ is coded as *Excr*. Similarly, the foreign direct investment (FDI) net figures expressed as a proportion of the balance of payment (BOP) at current US$ is coded as *FDIbop*, the tax rate on goods and

services expressed as a percentage of revenue is coded as *Taxr*, broad money expressed in terms of LCU is coded as *Bmoney*, and the gross domestic savings[5] (GDS) in current US\$ is coded as *GDS*. The annual data collected is used to estimate the yearly impact of these variables' indicators during the period between 2003–2014.

3.3. Other Relevant Data Source

In order to operationalize the propositions that are put forward in the hypothesis development stage of this study, we included data sources such as the Fraser Institute's Economic Freedom of the World[6] (EFW) index, which is coded as *EF*, as well as the World Bank's Ease of Doing Business[7] (EDB) index, which is coded as *EDB*, while the JSE's market capitalization is coded as *JSEcap*. The use of these econometric estimation variables in this research follows the methodological procedure of similar studies (Fraser Institute, 2016; Heritage Foundation, 2016; Stanlib, 2015; World Bank, 2016). Consequently, we use the annual data collected to estimate the yearly impact of these indicators during the timespan of this study (i.e., 2003–2014). This dataset is preferred because it adequately compensates for inconsistencies resulting from the data gathering process of this kind of study. This ensures that the conclusion for this study is accurate, valid and reliable, as opposed to other non-aggregate variables that only measure single factors and the effects of individual decisions using microeconomic data.

4. Methodology

The aim of this empirical study is to reveal the impact that South Africa's TESEA rate has on entrepreneurship decisions and to demonstrate the influence of various macroeconomic factors on this phenomenon. We assume that the exogenous effect of the environment, which can be moderated by the level of FDI and the prevailing market capitalization of the JSE, alters the magnitude of entrepreneurial intentions. For identification, our empirical design exploits four potential sources of variation: (a) the regulatory measurement impact of the economic freedom of the world and the ease of doing business index; (b) the current rate of unemployment; (c) the prevailing rates of interest, inflation, tax and currency exchange valuation; and (d) the level of FDI and the market capitalization of the JSE. The extant literature suggests that both exogenous and endogenous factors influence the level of entrepreneurialism. Therefore, following Amorós and Bosma (2014), we estimate the TESEA rate in the relationship with the aforementioned causes of market variations. The use of this method is to accurately probe both the behavior and the attitudes of entrepreneurs who establish SMEs taking cognizance of their risk appetite. Consequently, a particular shift in individual entrepreneurial behavior can be correlated with a shift in idiosyncratic exogenous variables. For instance, in a recent work, Albulescu and Tămăşilă (2014) employed this method to investigate the influence of inward and outward FDI on opportunity-driven and necessity-driven entrepreneurship.

Concerns about collinearity, heteroskedasticity, serial autocorrelation, validity and reliability issues were addressed by computing Cronbach's alpha values for each variable, as well as through rigorous factor loadings, unique variances, principal component analysis (PCA) and regression analysis that utilized robust standard errors while implementing a generalized linear model to affirm the statistical significance of these relationships. In addition, we control for each variable that might directly influence the analysis in order to avoid spurious correlations in our results.

4.1. Variables

4.1.1. Dependent Variable

Similar to Deakins and Freel (2012); Amorós et al. (2013); Bosma (2013); Shane and Nicolaou (2013) and Amorós and Bosma (2014), the TESEA rate is used as the dependent variable because there is no singular measure of the entrepreneurial intentions and aspirations of individuals that have consistently surveyed a percentage of the adult population of various countries across the globe. In South Africa, although there are other

measures, such as the Absa SME index, their measurements are not elaborate due to the presence of some gaps in enumeration years, as well as changes in the metric. Also, the high rate of business failure has led to the problem of double counting since both dormant cooperatives and closed corporations and companies remain in the database of the department of trade and industry (DTI). More so, the South African Revenue Service (SARS), which is a government agency mandated to carry out the responsibility of filling SME tax returns, has steadfastly refused to divulge this information (i.e., the provision of a detailed record of tax remittances across the country) to both researchers and the academe, thus making the computation of South African SME data a very cumbersome process. Consequently, the TESEA rate is the commonly used measure of entrepreneurial goals and ambition because the data is relatively less noisy and is also a more reliable measure of the current level of entrepreneurship in South Africa than the other datasets provided by both private and public agencies (Amorós & Bosma, 2014).

4.1.2. Independent Variables

Four categories of independent variables were selected.

(1)   Institutional indicators: The GDP value is measured in various ways so that our conclusions are both valid and reliable (UNCTAD, 2015). As stated earlier, the GDP consumer prices, GDP purchasing power parity, GDP per capita, and the GDP growth rate were used concurrently in addition to the EFW rating and EDB ranking to determine the effects of the TESEA rate on the level of entrepreneurship in South Africa.

(2)   Unemployment indicators: The major effect of unemployment is that it causes actively engaged individuals to seek solutions to societal challenges through opportunity or necessity entrepreneurship. We use the total unemployment rate, male unemployment rate, female unemployment rate and the start-up rate to measure the level of nascent entrepreneurship in relation to the TESEA rate (Deakins & Freel, 2012).

(3)   Monetary and fiscal policy indicators: Monetary policy involves setting base interest rate levels and employing quantitative easing to either increase or decrease the supply of money in an economy. However, the government's fiscal policy measures use the budgetary mechanism to regulate government spending and the level of taxation in South Africa (Herrington et al., 2014). Taken together, the anticipated economic goal is to attain higher economic growth and control inflation. We use the interest rate, tax rate, inflation rate and exchange rate to measure the influence of the TESEA rate on entrepreneurship levels in South Africa.

(4)   FDI and market capitalization indicators: The impact of exogenous factors on businesses have been researched extensively by scholars, such as Dunning (2010); Ludwig and Pemberton (2011) and Kozlenkova et al. (2014). This MBV relies on the fact that sustainable competitive advantage can be gained via perspicacious market positioning during the product life cycle of an SME business, but it can be replicated faster using the born global strategy. We use the FDI net figure and the market capitalization of the JSE to evaluate the impact of this phenomenon on South Africa's TESEA rate, given the obvious fact that the availability of surplus and cheap investable resources can also lead to an intense exploitation of entrepreneurship opportunities by creative and innovative individuals.

4.1.3. Mediators

The mediator variables in this study were used to determine the strength of the relationships that exist between the dependent and independent variables. According to Amorós and Bosma (2014), the number of entrepreneurs, which is determined by the TESEA rate, is a factor of the total entrepreneurial intentions of potential entrepreneurs within a three-year period. We tabled this variable as a moderator for this study together with the number of individuals that considered entrepreneurship as a good career choice and gave a high status to successful entrepreneurs. Likewise, since national attitudes stimulate perceptions about the level of visibility and

the attractiveness of entrepreneurship, we considered the level of positive media attention for entrepreneurship in South Africa as a moderator. Similarly, entrepreneurship profiles have transcended beyond the desire of individuals starting a new business. Apparently, researchers are left with no choice but to study the motivators of this phenomenon, i.e., the owner-managers of established firms. Thus, the start-up rate, which is also known as the nascent entrepreneurship rate, and the new firm (or business ownership) rate were also considered as moderators. Congruently, the opportunity rate (which is associated with creative innovation) and the necessity-driven entrepreneurship rate that is associated with a fundamental need for jobs and subsistence living were also synchronously considered as moderators (Herrington et al., 2014).

4.1.4. Control Variables

To account for other possible determinants of South African entrepreneurial inclinations, we controlled for the level of the male TESEA rate, female TESEA rate, the GDS rate and broad money supply. Previous studies have demonstrated a strong relationship between the gender of early-stage entrepreneurs and the rate of unemployment and economic growth. Also, higher GDS figures lead to the availability of higher investable funds that can be channeled to further the capital accumulation process in South Africa. According to Amorós and Bosma (2014), higher levels of GDP yields more and better job opportunities worldwide. This statement is reinforced by Deakins and Freel (2012), who observed that the rising female TESEA rate can be associated with the labor sector preference for male employees over female employees. Additionally, the amount of money in circulation causes inflationary trends to occur, leading to various monetary and fiscal policy initiatives, which also influences the level of the TESEA rate to change over time, ceteris paribus (Fairlie, 2011; Herrington et al., 2014; Herrington & Kew, 2018; World Economic Forum, 2015).

4.2. Model

A generalized linear model (GLM) poisson regression was used to analyze the impact of South Africa's TESEA rate on various macroeconomic conditions that were specified in the hypothesis section of this study. As stated earlier, this procedure was adopted in order to avoid estimation biases. Furthermore, the predicted proportion of the estimation follows the GLM technique as represented by the formula *In E(y) = xβ, y ~ poisson*, where *y* is the expected distribution of the Poisson family *y* using a link identity function to rationalize the explanatory variables (Cameron & Trivedi, 2010; Hardin & Hilbe, 2013; McCullagh & Nelder, 1989). Hence, the econometrics investigation for this study was analyzed using the GLM procedure of STATA 13.0. Correspondingly, some of the modular table effects for this study are reported with the aid of graphical simulations and illustrations, after which we interpret the statistical and economic significance of the effects for all the hypotheses (i.e., Hypotheses 1, 2, 3, and 4) based on the discussed hypothesized moderation effects.

5. Results

The Cronbach's alpha ($\square$) test for all the econometric variables for this study is reported in Table 2, which was conducted to examine the reliability and internal consistency of the dataset. It can be observed that the Cronbach's α for all the econometrics' variables were above the recommended threshold of 0.70, hovering between the 0.95 to 0.96 levels (Nunnally, 1978). The minimum value of the item total correlation among all the constructs surpassed the minimum level (≤ 0.3) recommended by Dunn, Seaker, and Waller (1994). This is confirmed by the item-test, item-rest and average interitem correlation values that are specified in the test scale result. Expectedly, the findings and conclusions of this study can be adjudged to be both valid and reliable.

Furthermore, a biplot graph displaying a two-dimensional biplot of the coordinates of our dataset was used to simultaneously show the observations (i.e., rows) as well as the relative positions of the variables (i.e., columns). The marker symbols (points) representing observations and the arrows representing the variables approximate

the correlation between the variables, which leads us to an agreement of their fair distribution in the dataset. In addition, the biplot of 12 observations and 28 variables yields an explained variance by component 1 of 0.969, and by component 2 0f 0.029, resulting in a total explained variance of 0.998. In addition, our observation biplot coordinates revealed five positive and seven negative dimensions, while our variables had about 21 variables centered around the zero point. Although not reported, it showed that the broad money in circulation is positively related to dimension 2, while the coordinates of the JSE market capitalization is negatively related to dimension1.

Table 2. Test scale results.

Parameter	Obs.	Sign	Item-test correlation	Item-rest correlation	Average interitem correlation	Alpha
TESEArate	12	+	0.924	0.916	0.434	0.954
GDPcp	12	+	0.915	0.905	0.434	0.954
GDPgr	12	-	0.472	0.430	0.458	0.958
GDPppp	12	+	0.856	0.841	0.437	0.955
GDPpc	12	+	0.877	0.864	0.436	0.954
EF	12	-	0.418	0.373	0.461	0.959
EDB	12	+	0.862	0.848	0.437	0.955
Unempr	12	-	0.082	0.030	0.480	0.961
Unemprmale	12	+	0.394	0.349	0.463	0.959
Unemprfemale	12	-	0.666	0.635	0.448	0.956
Intr	12	-	0.616	0.582	0.451	0.957
Infr	12	+	0.267	0.218	0.470	0.960
Excr	12	+	0.599	0.564	0.451	0.957
FDIbop	12	-	0.277	0.228	0.469	0.960
JSEcap	12	+	0.791	0.770	0.441	0.955
Startupr	12	+	0.776	0.754	0.442	0.955
Newfirmr	12	+	0.880	0.867	0.436	0.954
Opportunityr	12	+	0.901	0.890	0.435	0.954
Necessityr	12	+	0.706	0.679	0.446	0.956
Entri	12	+	0.600	0.564	0.451	0.957
Goodcc	12	+	0.938	0.931	0.433	0.954
Highs	12	+	0.938	0.931	0.433	0.954
Mediaa	12	+	0.975	0.972	0.431	0.953
MaleTESEAr	12	+	0.768	0.745	0.442	0.955
FemaleTESEAr	12	+	0.784	0.762	0.441	0.955
Taxr	12	+	-0.000	-0.053	0.484	0.962
Bmoney	12	+	0.942	0.935	0.433	0.954
GDS	12	+	0.904	0.893	0.435	0.954
Test Scale					0.447	0.958

Note: Parameters with a + sign have positive item-test, item-rest and average interitem correlations, while parameters with a – sign have negative item-test, item-rest and average interitem correlations.

Table 3 illustrates the factor loadings of the study's variables, and it also shows that there is fair distribution between these variables through a combination of a transformation pattern matrix that reveals a fitted covariance/correlation matrix. In support of this analysis, the Appendix presents a scree plot of eigenvalues after the factor graph in Figure A1, which indicates that the scree plot of eigenvalues (i.e., the covariance or correlation matrix) after factor is characterized by a smooth L-shaped transition. Thus, this demonstrates that the dataset has a good fit with the statistical model equation for this study.

Table 4 provides the descriptive statistics and correlations of this study's econometric variables. The ensuing correlations indicate that collinearity does not pose a serious problem. Nevertheless, instances of high correlation are taken into consideration when applying the GLM analysis so that it does not invalidate the results generated thereafter. Positive correlations were observed between South Africa's TESEA rate and the GDP per capita, as well as the ease of doing business, which is consistent with Hypothesis 1. Similarly, a negative correlation was found between the dependent variable and the female unemployment rate and lending interest rate. This is consistent with Hypotheses 2 and 3.

Table 5 presents the GLM analysis results to test this study's four empirical hypotheses. Model 1 indicates that the log-likelihood value of -22.60 signifies a strong goodness of fit among the statistical variables and hypotheses. Likewise, the Akaike Information Criterion (AIC) value of 5.60 implies that the relative quality of our statistical model is good, while the Bayesian Information Criterion (BIC) value of -2.49 shows that the efficiency of the parameterized model in terms of predicting the data is suitable. The pseudo R^2 value of 0.11 implies that the variables in this model exhibit high predictive ability. Similarly, the Model 2 (log-likelihood = -22.60, AIC = 5.60, BIC = -2.49 and Pseudo R^2 = 0.11), Model 3 (log-likelihood = -22.60, AIC = 5.77, BIC = 2.25 and Pseudo R^2 = 0.11), and Model 4 (log-likelihood = -22.60, AIC = 5.43, BIC = -4.97 and Pseudo R^2 = 0.11) measurements indicate that our model can efficiently predict the study's hypotheses.

Based on the econometric analysis, Model 1 is the baseline model that includes the main exogenous variables which influence the rate of economic development in South Africa, such as the GDP at current prices, the real GDP growth rate, the GDP purchasing power parity, GDP per capita, the economic freedom of the world, as well as the ease of doing business. It was observed that these independent variables have a non-significant impact on the dependent variable. In addition, all the mediator and control variables, except for the proxy variable representing the fact that entrepreneurship can be viewed as a good career choice ($p < 0.001$) during turbulent economic periods, were non-significant. Likewise, all GDP variables have a negative non-significant impact on the TESEA rate, excluding the GDP per capita which relies on efficiency, innovation and optimal utilization of market knowledge, as well as the level of economic freedom of the world and the ease of doing business that all have a positive and non-significant impact on the TESEA rate of South Africa.

In Model 1, the measurement of Hypothesis 1 (LR Chi-squared = 5.58, Prob > Chi2 = 0.85) specifies a nonsignificant impact on the dependent variable, which is South Africa's TESEA rate. Therefore, we reject the hypothesis that the relationship between the TESEA rate and the rate of economic development in South Africa is influenced and impacted by institutional factors, such as the degree of freedom and the ease of doing business (at least in the short run). This is consistent with the work of theorists Konopik and Lindgren (2010); Deakins and Freel (2012); Davis (2013), and the World Bank (2016).

In Hypothesis 2, we propose that the rate of unemployment in South Africa is positively associated with the dependent variable. Consistent with the findings in Hypothesis 1, we find that the relationship between these

variables is non-significant (LR Chi-squared = 5.58, Prob > Chi2 = 0.85). The unemployment rate is positively associated with the dependent variable (Herrington et al., 2014); however, it has a non-significant impact on South Africa's TESEA rate. Likewise, our mediator variables, comprising of measures of individual participation rates such as entrepreneurial intentions, the amount of respect and recognition that results in a high status for successful entrepreneurs and the level of media attention for entrepreneurship, were all negative and significant ($p < 0.05$). However, the media attention for entrepreneurship showed a positive and significant relationship with South Africa's TESEA rate. Among the control variables, the broad money supply was negatively significant when regressed with the dependent variable. These results are consistent with the findings of Deakins and Freel (2012) and Amorós and Bosma (2014), which states that the more the amount of public visibility that has been given to entrepreneurship through detailed media coverage, the more the number of would-be entrepreneurs that are willing to take up risky investments in private businesses in order to reap good returns in the future.

We also find in Model 3 that the real lending rate ($p < 0.05$), inflation rate ($p < 0.05$), and the tax rate on goods and services ($p < 0.01$) have a negative and significant relationship with the dependent variable. Similarly, the official rate of exchange had a negative non-significant relationship with South Africa's TESEA rate. These results are consistent with the predictions in international business, which supports the notion that these variables raise the cost of doing business, leading to fewer participation rates during peak periods (see Amorós & Bosma, 2014; Casson, 2010; Deakins & Freel, 2012; Herrington et al., 2014; Herrington & Kew, 2018; Statistics South Africa, 2015; UNCTAD, 2015; World Economic Forum, 2015).

The mediator variables, that view entrepreneurship as a good career choice ($p < 0.01$) and canvas for a high level of media attention for entrepreneurship ($p < 0.05$), have a negative and significant relationship with the dependent variable. However, the variable relating to high status that is given to successful entrepreneurs becomes positive and significant ($p < 0.01$) when regressed with the dependent variable, which is consistent with the findings of Amorós and Bosma (2014) and Herrington et al. (2014). The control variables reveal that the male TESEA rate has a negative and significant ($p < 0.05$) relationship with the dependent variable and South Africa's female TESEA rate had a positive and significant relationship ($p < 0.01$) with the dependent variable, which means that females were more motivated to start businesses than their male counterparts.

In Model 4 we observe that the level of foreign direct investment (net BOP) and the JSE market capitalization have a negative and significant ($p < 0.05$) relationship with South Africa's TESEA rate (see (Acquaah, Zoogah, & Kwesiga, 2013; Hunya, 2012; Mthombeni, 2006; Pradhan, 2010)). Our mediator variables, the start-up rate ($p < 0.05$), new firm rate ($p < 0.05$), opportunity rate ($p < 0.05$), necessity rate ($p < 0.001$), entrepreneur intentions ($p < 0.001$), good career choice ($p < 0.001$), and high status to successful entrepreneurs ($p < 0.01$), all have a positive and significant relationship with the dependent variable, which is consistent with the GEM findings (see (Amorós & Bosma, 2014; Herrington et al., 2014)).

Table 3. Factor loadings (pattern matrix) and unique variances.

Parameter	Factor1	Factor2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8	Factor9	Factor 10	Factor 11	Unique ness
TESEArate	0.930	0.027	0.094	0.276	0.186	-0.020	0.041	0.070	-0.061	-0.046	-0.048	0.000
GDPcp	0.931	0.114	0.208	-0.094	-0.127	0.098	-0.183	-0.085	0.050	0.006	-0.004	-0.000
GDPgr	-0.434	0.096	0.765	0.199	0.328	0.081	0.089	-0.227	0.019	-0.046	0.031	0.000
GDPppp	0.851	-0.415	0.049	-0.306	-0.055	0.053	-0.015	-0.008	-0.009	0.029	0.006	-0.000
GDPpc	0.894	0.095	0.304	-0.037	-0.185	0.104	-0.209	-0.076	0.053	0.002	-0.008	0.000
EF	-0.364	0.127	0.627	-0.156	0.483	0.401	-0.119	0.131	-0.069	0.021	0.054	0.000
EDB	0.857	-0.012	-0.336	-0.199	0.207	0.034	0.169	-0.180	0.019	-0.079	0.047	0.000
Unempr	-0.078	0.769	-0.577	0.123	0.144	0.145	-0.107	-0.019	-0.012	0.029	-0.010	-0.000
Unemprmale	0.389	0.611	-0.667	0.061	0.011	0.113	-0.101	0.035	-0.021	0.046	-0.011	0.000
Unemprfemale	-0.652	0.619	-0.220	0.193	0.252	0.147	-0.105	-0.099	0.018	0.000	-0.006	0.000
Intr	-0.647	-0.549	-0.221	0.316	0.112	0.305	0.089	0.114	0.040	0.051	0.024	-0.000
Infr	0.232	-0.821	-0.315	0.017	0.169	0.366	-0.037	-0.041	0.034	-0.011	-0.078	0.000
Excr	0.589	-0.091	-0.568	-0.433	0.300	0.016	0.187	-0.051	-0.033	-0.012	0.074	0.000
FDIbop	-0.222	0.614	0.190	-0.575	0.263	-0.014	0.147	0.242	0.237	-0.031	-0.029	0.000
JSEcap	0.813	0.068	0.254	-0.436	-0.142	0.046	0.030	0.128	-0.175	0.095	0.034	0.000
Startupr	0.772	-0.220	0.169	0.437	0.289	-0.125	0.165	0.058	-0.070	0.010	-0.022	-0.000
Newfirmr	0.891	0.333	-0.130	0.094	0.052	0.115	-0.099	0.146	-0.079	-0.125	0.006	0.000
Opportunityr	0.902	-0.177	0.032	0.204	0.294	0.120	0.051	0.044	-0.043	-0.014	-0.067	0.000
Necessityr	0.720	0.525	0.100	0.368	-0.079	-0.189	-0.012	0.110	-0.046	-0.059	0.034	0.000
Entri	0.581	0.086	-0.046	0.726	-0.211	0.140	0.168	0.075	0.134	0.053	0.089	-0.000
Goodcc	0.949	0.111	0.177	-0.026	-0.158	0.083	0.114	0.006	0.073	0.032	-0.065	-0.000
Highs	0.948	0.193	0.094	-0.098	-0.155	0.048	0.128	-0.034	0.027	0.008	-0.020	0.000
Mediaa	0.977	0.030	0.053	0.060	-0.059	0.053	0.173	-0.032	0.031	0.027	0.003	0.000
MaleTESEAr	0.768	-0.260	-0.013	0.154	0.402	-0.255	-0.282	-0.002	0.096	0.043	0.037	-0.000
FemaleTESEAr	0.794	-0.039	-0.016	0.007	0.499	-0.318	-0.091	-0.024	0.042	0.082	-0.016	0.000
Taxr	0.040	0.931	0.233	0.044	0.051	0.107	0.153	-0.167	-0.055	0.074	-0.038	-0.000
Bmoney	0.944	-0.084	-0.105	-0.274	0.030	0.095	-0.013	-0.065	0.013	0.003	0.035	-0.000
GDS	0.909	-0.010	0.153	0.022	-0.259	0.205	-0.185	-0.020	0.071	-0.036	0.028	0.000

Table 4. Descriptive statistics and correlations.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Total early-stage	1.00														

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
entrepreneurial activity															
2. GDP at current (market) prices	0.82	1.00													
3. GDP real growth rate	-0.23	-0.28	1.00												
4. GDP purchasing power parity	0.69	0.80	-0.45	1.00											
5. GDP per capita	0.80	0.99	-0.21	0.77	1.00										
6. Economic freedom of the world	-0.23	-0.19	0.77	-0.29	-0.15	1.00									
7. Ease of doing business	0.74	0.71	-0.54	0.77	0.61	-0.42	1.00								
8. Unemployment rate	-0.05	-0.10	-0.26	-0.45	-0.17	-0.12	0.11	1.00							
9. Male unemployment rate	0.33	0.31	-0.62	0.03	0.23	-0.42	0.52	0.86	1.00						
10. Female unemployment rate	-0.53	-0.59	0.32	-0.89	-0.60	0.33	-0.47	0.75	0.31	1.00					
11. Lending (real) interest rate	-0.53	-0.75	0.17	-0.42	-0.72	0.16	-0.51	-0.16	-0.39	0.25	1.00				
12. Inflation rate	0.19	0.08	-0.33	0.53	0.05	-0.17	0.36	-0.38	-0.15	-0.48	0.50	1.00			
13. Official exchange rate	0.43	0.39	-0.66	0.63	0.27	-0.39	0.89	0.19	0.51	-0.34	-0.29	0.43	1.00		
14. Foreign direct investment (net BOP)	-0.27	-0.11	0.24	-0.28	-0.15	0.48	-0.11	0.32	0.12	0.40	-0.34	-0.59	0.04	1.00	
15. JSE market capitalization	0.65	0.86	-0.32	0.82	0.83	-0.08	0.64	-0.23	0.17	-0.68	-0.74	0.02	0.48	0.11	1.00
16. Start-up rate (nascent entrepreneurship)	0.92	0.60	-0.06	0.60	0.60	-0.19	0.59	-0.26	0.06	-0.56	-0.27	0.31	0.30	-0.43	0.44
17. New firm rate (business ownership)	0.88	0.84	-0.45	0.59	0.79	-0.27	0.77	0.30	0.67	-0.30	-0.66	0.02	0.52	-0.05	0.69
18. Opportunity rate	0.96	0.77	-0.25	0.77	0.74	-0.17	0.79	-0.15	0.25	-0.58	-0.36	0.44	0.53	-0.33	0.62
19. Necessity rate	0.80	0.70	-0.18	0.28	0.70	-0.28	0.47	0.29	0.54	-0.15	-0.72	-0.38	0.13	-0.03	0.51

Parameters															
20. Entrepreneurial intentions	0.69	0.48	-0.19	0.25	0.51	-0.40	0.35	0.11	0.35	-0.23	-0.13	0.10	0.01	-0.49	0.19
21. Good career choice	0.87	0.95	-0.31	0.79	0.93	-0.28	0.74	-0.12	0.31	-0.63	-0.70	0.08	0.43	-0.10	0.85
22. High status to successful entrepreneurs	0.84	0.94	-0.37	0.77	0.91	-0.32	0.80	-0.02	0.41	-0.58	-0.77	0.02	0.51	-0.04	0.87
23. Media attention for entrepreneurship	0.92	0.90	-0.36	0.81	0.87	-0.36	0.83	-0.10	0.35	-0.64	-0.62	0.19	0.53	-0.21	0.79
24. Male TESEA rate	0.81	0.65	-0.25	0.68	0.62	-0.22	0.66	-0.18	0.16	-0.54	-0.35	0.38	0.48	-0.33	0.45
25. Female TESEA rate	0.83	0.66	-0.23	0.65	0.60	-0.19	0.76	-0.04	0.28	-0.45	-0.53	0.20	0.60	-0.08	0.55
26. Tax rate on goods and services	0.10	0.18	0.33	-0.35	0.17	0.27	-0.00	0.60	0.43	0.54	-0.54	-0.78	-0.16	0.56	0.13
27. Broad money	0.79	0.89	-0.52	0.92	0.83	-0.33	0.92	-0.09	0.38	-0.67	-0.60	0.36	0.76	-0.13	0.85
28. Gross domestic savings	0.80	0.97	-0.35	0.81	0.97	-0.27	0.65	-0.15	0.28	-0.64	-0.59	0.21	0.33	-0.28	0.79
Mean	6.94	3.10	3.13	11792.89	6175.81	6.78	32.58	24.16	21.52	27.3	11.10	5.65	7.85	-2.63	7.14
Standard Deviation	1.90	7.25	1.99	691.32	1206.55	0.16	4.52	1.35	1.80	1.49	2.30	2.45	1.34	4.44	2.27
Minimum	4.3	1.75	-1.54	10382.02	3799.44	6.49	28	22.3	18.6	25.5	8.5	1.39	6.36	-1.20	2.61
Maximum	10.6	4.17	5.59	12454.19	8080.87	7.06	41	27.1	23.7	31.1	15.13	11.54	10.85	5.31	9.43

Table 4. Continued…

Parameters	16	17	18	19	20	21	22	23	24	25	26	27	28
16. Start-up rate (nascent entrepreneurship)	1.00												
17. New firm rate (business ownership)	0.63	1.00											
18. Opportunity rate	0.92	0.80	1.00										
19. Necessity rate	0.63	0.84	0.59	1.00									
20. Entrepreneurial intentions	0.68	0.60	0.61	0.72	1.00								
21. Good career choice	0.69	0.84	0.81	0.74	0.60	1.00							
22. High status to successful entrepreneurs	0.63	0.87	0.77	0.75	0.55	0.99	1.00						
23. Media attention for entrepreneurship	0.78	0.86	0.88	0.73	0.66	0.97	0.97	1.00					
24. Male TESEA rate	0.81	0.62	0.84	0.49	0.39	0.58	0.55	0.67	1.00				
25. Female TESEA rate	0.79	0.68	0.83	0.56	0.31	0.64	0.64	0.72	0.94	1.00			

26. Tax rate on goods and services	-0.09	0.29	-0.08	0.51	0.14	0.20	0.26	0.12	-0.26	-0.02	1.00		
27. Broad money	0.60	0.80	0.82	0.50	0.35	0.88	0.90	0.90	0.70	0.74	-0.06	1.00	
28. Gross domestic savings	0.60	0.81	0.77	0.65	0.60	0.93	0.90	0.89	0.60	0.54	0.04	0.85	1.00
Mean	4.35	2.63	4.64	2.19	14.13	65.2	65.06	65.84	7.51	5.48	34.65	1.80	6.01
Standard Deviation	1.12	0.97	1.47	0.67	3.01	8.74	9.10	9.95	2.47	1.45	1.72	6.37	1.48
Minimum	2.7	1.6	2.8	1.5	9.3	48	48	47.5	4.5	3.7	31.35	8.04	3.41
Maximum	6.6	4.1	7.3	3.2	19.6	77.5	77.6	78.6	12.3	9	36.96	2.70	8.34

Notes: N = 12. The gross domestic product (GDP) at current prices, and the Johannesburg Stock Exchange (JSE) market capitalization, as well as the foreign direct investment (FDI) net balance of payment (BOP) and the gross domestic savings (GDS) figures are expressed in billions of US$. Broad money is expressed in trillions in the local currency unit (LCU) – i.e., South African rand.

Table 5. GLM analysis results.

Parameter	Model 1	Model 2	Model 3	Model 4
Intercept	-21.73 (193.08)	-25.98 (279.05)	15.22 (128.64)	-1.73 (74.98)*
GDP at current (market) prices	-2.62 (7.10)			
GDP real growth rate	-0.98 (2.10)			
GDP purchasing power parity	-0.01 (0.01)			
GDP per capita	0.02 (0.04)			
Intercept	6.31 (15.00)			
Ease of doing business	0.44 (1.91)			
Unemployment rate		8.31 (125.00)		
Male unemployment rate		-3.97 (62.10)		
Female unemployment rate		-3.52 (55.35)		
Lending (real) interest rate			-0.30 (8.64)*	
Inflation rate			-0.10 (2.51)*	
Official exchange rate			-0.23 (2.38)	
Tax rate on goods and services			-0.11 (10.72)**	
Foreign direct investment (net BOP)				-9.91 (3.74)*
JSE market capitalisation				-4.70 (1.37)*
Mediators				
Start-up rate (nascent entrepreneurship)		1.33 (13.16)		0.97 (30.85)*
New firm rate (business ownership)				0.45 (10.14)*

Opportunity rate			1.50 (3.47)	0.39 (8.81)*
Necessity rate				0.04 (47.59)***
Entrepreneurial intentions	-0.74 (2.89)	-0.49 (9.03)*	0.19 (1.38)	0.03 (8.36)***
Good career choice	0.00 (1.29)***	0.10 (1.04)	-0.07 (5.93)**	0.00 (5.05)***
High status to successful entrepreneurs	-0.52 (2.63)	-0.08 (5.2)*	0.06 (11.23)**	0.19 (16.35)**
Media attention for entrepreneurship	0.86 (3.23)	0.30 (10.78)*	-0.07 (4.04)*	-0.17 (12.62)**
Controls				
Male TESEA rate	0.24 (1.27)	1.17 (17.04)	-0.23 (5.72)*	0.03 (3.01)**
Female TESEA rate	0.44 (2.39)	-2.11 (27.60)	0.26 (18.19)**	
Broad money	-5.49 (2.06)	-2.02 (6.07)*		
Gross domestic savings	-7.13 (2.67)			
Year effects	Included	Included	Included	Included
Number of observations	12	12	12	12
Log-likelihood	-22.6	-22.6	-22.6	-22.6
AIC	5.6	5.6	5.77	5.43
BIC	-2.49	-2.49	2.25	-4.97
LR Chi-Squared	5.58	5.58	5.58	5.58
Prob > Chi2	0.85	0.85	0.9	0.78
Pseudo R^2	0.11	0.11	0.11	0.11

Notes: All tests are two-tailed; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; Standardized coefficients are reported, and standard errors are in parentheses.

The variable relating to media attention for entrepreneurship remains negative and significant ($p < 0.01$) when regressed with South Africa's TESEA rate, thus allowing for greater publicity to improve the entrepreneurial participation rates in South Africa. Nevertheless, the male TESEA rate becomes positive and significant ($p < 0.01$) in relation to the dependent variable (Amorós et al., 2013).

This implies that varying relationships exemplified by the TESEA rate of South Africa can be positively influenced and mediated by the macroeconomic conditions that are associated with the level of FDI and the market capitalization of the JSE (Amorós & Bosma, 2014; Herrington et al., 2014; Herrington & Kew, 2018). However, this relationship is statistically non-significant (LR Chi-squared = 5.58, Prob > Chi2 = 0.78) in Hypothesis 4. Additionally, a combination of factors, such as the BBBEE legislation, the high level of corruption, poor business management skills, and politicking, can also make the TESEA rate of South Africa sway over time (Amorós et al., 2013).

A higher TESEA rate is positively associated with higher GDP per capita levels, ease of doing business levels and the rate of economic freedom in the world, as well as the current unemployment rate in South Africa. Consequently, both male and female entrepreneurs will have a higher TESEA rate when there is economic growth across the board, i.e., when income is equally distributed, ceteris paribus. Furthermore, it was observed that when unemployment is high, South African males' TESEA rate increases, while that of females decreases. Also, when the FDI (net BOP) values along with the JSE market capitalization levels reduce, more South Africans, especially males, tend to start new businesses that are mostly necessity driven with few opportunity-driven enterprises springing up due to high level of entrepreneurial intentions, which is obviously because entrepreneurship is viewed as a good career choice and is given a high status. Taken together, if a high status is given to successful entrepreneurs and is also viewed as a good career intention, the start-up rate, new firm rate, opportunity rate and necessity rate would increase along with the level of entrepreneurial intention in South Africa, thus jointly boosting South Africa's TESEA rate2, and vice versa.

5.1. Additional Analyses and Robustness Checks

To ensure the robustness of the results and to further explore some of our GLM results, a number of additional analyses were performed. First, in the theoretical section of our study we focused on the effect that the TESEA rate has on the level of entrepreneurship considering a cluster of macroeconomic factors, which raises some concerns and stimulates scholarly debate on contemporary entrepreneurship literature. Thus, this led us to select this as the dependent variable. However, another factor that may accurately measure the impact of entrepreneurship in South Africa is the start-up (nascent entrepreneurship) rate, which was a little farther from our main objective of measuring entrepreneurial intention, attitude and behavior. We therefore coded it as a proxy variable that was included as one of the independent variables for this study.

According to Amorós and Bosma (2014), the GEM focuses on the advance start of new firms (i.e., nascent entrepreneurship) due to the shift in the entrepreneurship literature towards the notion that this phenomenon is indeed procyclical in nature. Herrington et al. (2014) posit that this indicator captures the level of dynamic earlystage entrepreneurial activity in South Africa. In other words, just as the TESEA rate in South Africa can be used as a yardstick to measure entrepreneurial activity because it strengthens our hypothetical propositions, we would likewise expect the new firm rate or nascent entrepreneurship rate to have a similar effect. To explore this further, we replace the dependent variable (South Africa's TESEA rate) with the new firm rate and, interestingly, the outcome produced similar results.

Afterwards, we checked the robustness of our results by using alternative model specifications to test our hypotheses (however, the results are not presented in this article). The GLM analysis revealed that Hypothesis 1, Hypothesis 2, Hypothesis 3 and Hypothesis 4 have a non-significant relationship (Hypothesis 1: LR Chi-squared = 3.07, Prob > Chi2 = 0.98; Hypothesis 2: LR Chi-squared = 3.06, Prob > Chi2 = 0.96; Hypothesis 3: LR Chi-squared = 3.07, Prob > Chi2 = 0.99; Hypothesis 4: LR Chi-squared = 3.05, Prob > Chi2 = 0.93) between the start-up rate and the independent variables, which implies that our datasets are robust. Finally, we found no evidence that the start-up (nascent entrepreneurship) rate differs from the TESEA rate in South Africa, and our analyses were consistent in both iterations.

6. Discussion and Conclusions

This study epitomizes meaningful advances in several aspects with respect to calls by Amorós and Bosma (2014) and others (for example, (Deakins & Freel, 2012; Herrington et al., 2014; Todaro & Smith, 2009; Zhan, 2014)) for a more nuanced treatment of the total early-stage entrepreneurial activity in entrepreneurship literature. In particular, we attribute the significance of the PEST-LE analysis, as observed by Konopik and Lindgren (2010)

and Davis (2013), as being responsible for the specific trends and indices that are exogenous when considering the impact of the TESEA rate on available macroeconomic variables. The results presented in the previous section reveal that all of our hypotheses were statistically non-significant to collectively influence the dependent variable. Nevertheless, these results are robust across all models presented. Our main findings indicate that when entrepreneurship is viewed as a good career choice, the TESEA rate increases, and vice versa. Also, the GDP per capita, which relies on efficiency, innovation and optimal utilization of market knowledge, as well as the level of economic freedom and the ease of doing business in South Africa, positively impacts the nation's TESEA rate. More so, the unemployment rate is positively associated with the TESEA rate in South Africa (Herrington et al., 2014), and the higher the level of public visibility given to entrepreneurship, the higher the number of would-be entrepreneurs that are willing to take up risky investments in private businesses across the country. Consequently, during periods of high lending rates, the TESEA rate increases because banks are more willing to lend at high interest rates for profitable purposes to small businesses, which leads to higher rates of return and low risk exposure on these loans. Likewise, a high inflation rate increases the prices of goods and services and encourages more individuals to seek and participate in profitable business initiatives as a way to curtail their own expenses. A high tax rate also encourages people to seek alternative ways of increasing their disposable income by engaging in entrepreneurial ventures to create wealth. However, higher official rates of exchange reduce the risk appetite of small investors, although it creates room for FDI to increase because of the pecuniary advantages that investors can benefit from.

Furthermore, the net FDI and the JSE market capitalization indices signify that a negative relationship exists between these variables and the TESEA rate in South Africa (Mthombeni, 2006). But when regressed individually, this study finds that the JSE market capitalization contributes positively to the TESEA rate as well as to the startup rate. Our moderator variables might be responsible for such sporadic changes in the reaction of individuals; therefore, we recommend that greater publicity should be given to the JSE's Alternate Exchange (AltX) in order to encourage investors to support the ongoing success in South Africa's small business sector (Amorós et al., 2013). Last, one of the main contributions of this study is that the prevailing entrepreneurial chasms in South Africa create different types of entrepreneurs; therefore, government agencies need to create awareness and support programmes to encourage and support these small businesses toward growth, productivity and national development. In addition, efforts need to be made by researchers and policy makers toward concentrating on the positive spillover effects of ME transfers, while the negative spillover effects of MEs, such as the artificial barriers to entry determined by high costs of R&D, need to be mitigated through proper legislation and an integrated country-wide government incubation programme (Ayyagari & Kosová, 2006; Zhan, 2014).

Due to the dynamic nature of individual traits, predicting entrepreneurial behavior entails a very complex process. Moreover, despite being well versed in entrepreneurship literature, this study has a fundamental shortcoming because the TESEA rate in South Africa is associated with the nascent phase of entrepreneurship. This is because after this stage comes a more advanced phase that deals with opportunity recognition and business discontinuation. On the other hand, since entrepreneurial aspirations vary over time, the relevant demand for a different dataset becomes imperative. Evidently, more individuals, national experts and international business professionals need to be surveyed to gather a more reliable dataset for entrepreneurial studies. In terms of implications for future research, this study highlights the importance of the TESEA rate and puts forward a notion of dynamic inventiveness and individual alertness to entrepreneurial opportunities. However, this should be a launch pad to probe other relationships because the GEM study is modelled on the World Economic Forum's Global Competitiveness Report. By using the grouping of country economies, which can be divided into factor-

driven, efficiency-driven, and innovation-driven economies, the GEM can compare economies across similar development levels and geographic locations as well as accurately measure and forecast the impact of entrepreneurship across countries and regions. According to Herrington et al. (2014), 3.9% of the adult population in South Africa in 2014 was engaged in nascent entrepreneurship, a figure well below the average of 14.1% in Sub-Saharan Africa. Further research can explore why and how these trends develop over the entrepreneurial continuum. Consequently, it is important to recognize that entrepreneurs can differ in their profiles and impact. Likewise, important consideration should be given to entrepreneurs who succeed due to the positive media projection of their operational activities to the public. Furthermore, other aspects, such as the level of employment that entrepreneurs create, their growth ambitions, and the extent to which groups such as youth and women are participating in the entrepreneurial activity ecosystem, need to be properly studied. Empirical research in this field is still in its early stages and therefore creates a gap in literature that entrepreneurship scholars can fill in the short term, medium term and long term.

6.1. Notes

[1]   Unlike traditional neoclassical economics, which is primarily concerned with efficient, least-cost allocation and optimal growth of resources, development economics transcends political economy and also deals with economic, social and institutional mechanisms, both private and public, that are necessary to bring about rapid (at least by historical standards) and large-scale improvements in standards of living for the people of Africa, Asia, Latin America, and the formerly socialist transition economies (Todaro & Smith, 2009).

[2]   Conventional neoclassical theory suggests that most underdeveloped countries typically suffer from the six gaps problem, which keep these countries trapped in a low-growth scenario (i.e., a vicious cycle of poverty), due to a resource or savings gap, a foreign exchange or trade gap, a skills and technology gap, a budgetary gap or deficit, a revenue gap, or an innovation gap (Dunning, 2010; Gerring & Thacker, 2008; Yusuf, 2009).

[3]   Contemporary research points out that an exhaustion of the six gaps problem eventually leads to proffering a common solution for less developed countries to break out of the vicious cycle of poverty through a creative destruction process that ultimately leads to a virtuous cycle of development (Dunning, 2010).

[4]   In finance, broad money is a measure of the aggregate money supply, including narrow money such as currency and coins, demand deposits, and non-institutional money market accounts.

[5]   Gross domestic savings consist of all the cumulative savings of the household sector, private corporate sector and public sector in South Africa. It is expressed in current US$ prices. Many consumers and investors have shifted to using their savings to buy physical assets compared to financial assets, which is an aftermath of the 2008 global financial crisis. This trend can be linked to a growing rise in inflationary pressures. However, South Africa's gross national savings is currently 15% of GDP (i.e., GDP minus final consumption expenditure, or it can be derived from deducting final consumption expenditure from gross national disposable income).

[6]   According to the Fraser Institute (2016), the Economic Freedom of the World measures the degree to which the policies and institutions of various countries across the globe are supportive of these economies. This is based on an index of the fundamental cornerstones of economic freedom, such as personal choice, voluntary exchange, freedom to compete, and the security of privately owned property.

[7]   The World Bank (2016) Doing Business Report defines "the ease of doing business" as an annual report that measures the state of health of economies based on detailed diagnostics underlying and embedded in characteristics such as the regulatory system, the efficacy of bureaucracy and the nature of business governance. The index precisely ranks countries on various aspects of business, such as starting a business, dealing with

construction permits, getting electricity, registering property, getting credit, protecting minority investors, paying taxes, trading across borders, enforcing contracts and resolving insolvency and labor market regulations.

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