South African tax incentives as a motivation for the private sector to invest in research and development

CM Rakgotho

orcid.org 0000-0003-1606-4714

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Supervisor: Mrs CE Meiring

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Student number: 28209117

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ABSTRACT

The South African economy is growing at a very low rate and slipped into recession once in 2017. The country has to find a possible way to sustainably grow the economy going into the future. It is the responsibility of both the government and the private sector to grow the economy.

Innovation is at the heart of economic growth. To grow the South African economy, the country has to develop new products to offer the market. In order to develop new products, research is required. The process of researching, developing and testing new products can be very long and expensive, coupled with the fact that not all research performed will conclude with a product that will create a return. This process and its risks and uncertainties might deter investors from spending on research.

The government has a responsibility to create an environment that encourages research and development. Investors taking the risk of using their resources to conduct research and to develop products that will eventually help the entire economy of the country to grow, would have to be incentivised to do so. Many governments around the world use tax breaks as one of the ways to incentivise investors who invest in research and development.

South Africa, just like many other countries, introduced a tax incentive to motivate the private sector to invest in research and development. Section 11D was introduced into the Income Tax Act (58 of 1962) (the Act) in 2006 and replaced the old section 11B, which had previously dealt with research and development incentives.

This purpose of this study is to evaluate whether the incentives provided by the Act are adequate to actually motivate the private sector in South Africa to invest in research and development. This will be achieved by making a comparison of the research and development incentives available in Brazil and China.

Brazil and China were chosen for the comparison due to them being members of the BRICS states. BRICS states are states whose economies are still in the growing phase, with a potential of being amongst the biggest economies in the world. These states have an agreement whereby they are committed to helping each other to grow and develop their economies.

It has been found that Brazil and China are offering more generous tax incentives for research and development as compared to those available in South Africa. A list of recommendations for the South African government has been presented at the end of the study.

KEYWORDS

Research and Development, South African Revenue Services, Income Tax Act, “Law of Good”, Circular 119, Tax incentives, Innovation, Economic growth.

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LIST OF ABBREVIATIONS

BRICS	: Brazil, Russia, India, China and South Africa
R&D	: Research and Development
OECD	: Organization for Economic Cooperation and Development
GERD	: Gross domestic expenditure on research and development
HSRC	: Human Sciences Research Council
GII	: Government Investment Incentives
US$	: United States of American Dollar
NRF	: National Research Foundation
RLAB	: Revenue Laws Amendment Bill
EBRD	: European Bank for Reconstruction and Development
PWC	: Price Waterhouse Coopers
FASSET	: Finance and Accounting Services Sector Education and Training
IPI	: Federal Import Excise Tax
The Act	: The Income Tax Act of South Africa, Act NO. 58 of 1962
The Law	: Law No. 11.196/ 05 of Brazil
DST	: Department of Science and Technology
EIT	: Enterprise Income Tax Law of China
HNTE	: High and New Technology Enterprise

CHAPTER 1: INTRODUCTION

1.1 INTRODUCTION

1.1.1 Background

Today small, medium-sized and large businesses and organizations have to employ Research and Development (R&D), as it has become a necessity to survive in the modern marketplace. R&D has been employed since the stone ages. Certain information gathering techniques were used by kings and kingdoms when they waged war against each other, where their sole intention was to gain an advantage in the war against their enemies (Exforsys, 2010).

Wu (2015) is of the opinion that innovation drives economic growth. But what fuels innovation? At the heart of it, R&D activities allow scientists and researchers to develop new knowledge, techniques and technologies (Wu, 2015). Sahin (2015:5) adds to the already wide breadth of economic literature which affirms this notion that investing in R&D increases economic growth. From a sample of 15 Organization for Economic Cooperation and Development (OECD) countries, including the United States of America (USA), Sahin estimates that a 1% increase in R&D spending could grow the economy by 0.61%. Griffith (2000) indicates that an increase of 10 percent in R&D expenditure will increase output by roughly 1%. This means that, as countries invest more in R&D, their economies will grow faster.

R&D expenditure is often measured as a ratio of the economy's total size. The ratio is known as the gross domestic expenditure on research and development (GERD) and 1% is regarded as the common international benchmark for the GERD ratio (HSRC, 2014). Data compiled by the World Bank indicates that the GERD ratio for the BRICS countries has been increasing from the year 2002 to the year 2012, except for the South African and Russian GERD.

South Africa joined the BRICS (Brazil, Russia, India, China and South Africa) states in the year 2010. The group was formed by the heads of states of the BRICS countries. The South African president requested for the country to join the group, and after numerous visits to the BRICS countries, having meetings with their heads of states, South Africa was invited to join the group (Gauteng Provincial Treasury, 2013). The one thing that all five countries have in common, is that their economies are still in the developing stage (Tisdall, 2016). The purpose of the group is to cooperate amongst the member nations and to provide financial assistance and to support various projects and infrastructure (O'Neil, 2013).

The BRICS Ministers of Science and Technology signed a Memorandum of Understanding to establish a research and development collaboration programme between the BRICS countries.

The aim of the programme was to support excellent research in specified research fields, identified by the BRICS partners through a multinational approach, to provide an opportunity for emerging researchers in the BRICS countries to meet and interact, to support the advancement of basic research and to contribute meaningfully to research capacity development (NRF, 2016).

It would therefore be a good benchmark to compare the GERD of South Africa to that of other BRICS countries. According to the World Bank (2015), the increase in GERD for the BRICS countries from 2002 to 2012 is as follows:

- Brazil 0.999% - 1.151%
- China 1.064% - 2.046%
- India 0.713% - 0.822%
- Russia 1.248% - 1.126%
- South Africa 0.761% - 0.732%

The South African GERD ratio is the lowest amongst the BRICS countries, and it is one of the only two countries whose GERD ratio has decreased over the years.

R&D is the biggest contributor to economic growth across the globe. We live in a globalized world and the innovation a country creates is associated with its economic growth (Sahin, 2015:1).

The social rate of return on R&D is higher than that of the private rate of return. The return shows the high importance of R&D for economic growth. The high social rate of return is one of the main reasons for government to consider more incentives for private R&D (Griffith, 2000).

It could therefore be derived that R&D is a very important factor for economic growth, as there is a positive correlation between R&D and economic growth.

There are multiple definitions of R&D which have been developed over time, all of which have the same characteristics. The Business Dictionary (2017) defines R&D as “systematic activity combining both basic and applied research, and aimed at discovering solutions to problems or creating new goods and knowledge”. Investopedia (2017) expands on the definition of R&D as the investigative activities a business conducts to improve existing products and procedures or to lead to the development of new products and procedures. The term "research and development" is widely linked to the concept of corporate or governmental innovation, known as research and technical or technological development in Europe. Activities that are classified as R&D differ from one company to the next.

1.2 Motivation of topic actuality

A survey done by the Human Sciences Research Council (HSRC) for the year 2012/13 found that only 44.3% of R&D in South Africa is undertaken by the business sector, the rest is attributable to government, higher education, the Science Council and non-profit organisations. South Africa is currently not achieving the 1% international benchmark for the GERD ratio. This suggests that South Africa needs to intensify efforts to direct investment spending to R&D across all sectors (HSRC, 2014).

There are a number of factors that could affect an entity's appetite to invest in R&D. The introduction of new products by a company is a huge contributor to companies engaged in R&D (EBRD, 2014). R&D costs a lot of money and according to Kalayci and Pamukcu (2014:853), there is a positive correlation between foreign direct investment in a company and the R&D they perform. According to Markovich, the more R&D a company performs, the more advantageous it becomes over its competitors globally (Markovich, 2012).

Governments in many countries directly support scientific and technical research, for example through grant-providing agencies like the National Science Foundation in the USA or through tax incentives like the R&D tax credit. The primary economic rationale for a government's role in R&D is that, without such intervention, the private market would not adequately supply certain types of research (Bernanke, 2011).

As governments in many countries use tax incentives to boost R&D, as implied by Bernanke (2011), the South African government also introduced legislation to try and boost R&D in the business sector. The government realised that the tax provisions, section 11B of the Income Tax Act (52 of 1962) (the Act), did not have enough incentives to promote R&D in the private sector and thus the act was amended by introducing section 11D to try and boost R&D in the private sector (National Treasury, 2006).

R&D expenditure in South Africa in the private sector increased from R8.4 billion in the 2005/06 year to R12.3 billion in the 2008/09 year (SAccess, 30). This coincides with the year that section 11D was introduced. The introduction of section 11D of the Act boosted R&D in the business sector, but this sector is still lacking behind government, and the country as a whole has an undesirable GERD ratio.

The HSRC (2014) survey results indicate that all R&D-performing sectors registered an increase in R&D expenditure in 2012/13, in both nominal and real terms.

The largest reported increase arose from the higher education sector, which grew by 5.9% in real terms and accounted for 67.9% of the total increase (HSRC, 2014). This indicates that, even

though there is a tax incentive for R&D for the business sector in South Africa, the increase in spending by the business sector on R&D is probably not enough.

As seen above, South Africa lags behind in R&D if compared to the international benchmark, as well as to the GERD for fellow BRICS countries. Furthermore, it was also identified by the HRSC survey report that R&D in the business sector could be further encouraged.

In this study the tax incentives available for R&D in Brazil and China will be considered in order to determine how R&D is encouraged in those countries, as the growth in R&D in both these BRICS countries have been noteworthy. In 2015 the gross domestic product (GDP) per capita for Brazil and SA was not very far apart, namely $11 211.89 and $7 585.80 respectively (World Bank 2017). The Business Dictionary (2017) defines GDP per capita as a measure of the total output of a country that takes gross domestic product (GDP) and divides it by the number of people in the country. The per capita GDP is especially useful when comparing one country to another, because it shows the relative performance of the countries. This indicates that the economies of South Africa and Brazil are roughly equal and could be comparable. China was chosen for consideration due to it having the highest GERD amongst all of the BRICS countries, and therefore it would be valuable to learn from its initiatives.

1.3 PROBLEM STATEMENT

It can be deduced from the GERD ratio of 0.76% stated above that South Africa is not undertaking enough R&D when benchmarked to the international norm of 1%. The BRICS countries are above the benchmark, apart from South Africa and India. Currently the majority of R&D is performed by government and its institutions, for example higher education.

The research question for this study is to consider if the current tax incentive, section 11D of the Act, is in line with tax incentives implemented by Brazil and China whose economies are still developing, and whether the South African government can do more in terms of tax incentives to further boost R&D in the private sector.

1.4 OBJECTIVES

1.4.1 Main Objective

The main objective of the research study from a tax perspective is to evaluate whether the current tax legislation is adequate to incentivise more R&D in South Africa, as compared to other BRICS countries whose economy is still in the developing stage, namely Brazil and China.

1.4.2 Secondary Objectives

The main objective is addressed by the following secondary objectives:

i. To analyse and provide an understanding of the current South African income tax incentives on R&D, section 11D of the Income Tax Act (58 of 1962). This secondary objective is addressed in chapter 2.

ii. To analyse and provide an understanding of the current Brazilian and Chinese income tax incentives on R&D. This secondary objective is addressed in chapter 3.

iii. To compare the income tax incentives for R&D available for South Africa, Brazil and China, in order to identify the differences and similarities in the countries' approaches to R&D. This secondary objective is addressed in chapter 4.

iv. To conclude on the findings of the study and to make recommendations based upon the findings of the study. This secondary objective is addressed in chapter 5.

1.5 RESEARCH DESIGN AND METHODS

1.5.1 Literature review

According to Saunders *et al.* (2007:595), a literature review is defined as "a detailed and justified analysis and commentary of the merits and faults of the literature within a chosen area and demonstrate familiarity with what is already known about the research topic". The study is a non-empirical study that will be based on the review of existing literature.

The purpose of this literature review is to determine if the current South African legislation in respect to income tax incentives is adequate to boost R&D to the level of other countries whose economies are also still developing. The income tax incentives provided by both the South African and the Chinese and the Brazilian laws are analysed. As already mentioned in the Topic motivation, China has the highest GERD ratio and it thus made sense to take China as comparison and to find out what that country is doing. Brazil was also elected for comparison due to its GDP being close to that of South Africa, which implies that their economies are roughly the same size. All these countries are part of the BRICS countries that are grouped together, based

on the fact that their economies are still developing; that even makes them more comparable. The incentives are compared and any differences, limitations and benefits in the incentives are identified.

The conclusion summarises the findings, and recommendation are made as to what improvements South African legislators could possibly implement to match their Chinese or Brazilian counterparts.

Sources consulted during the review included:

- South African legislation
- Chinese legislation
- Organisation for Economic Co-operation and Development reports
- Taxation summaries of reputable professional firms
- Taxation articles
- Academic research reports
- Accredited journal articles
- Master's dissertations and PhD studies

1.5.2 Paradigmatic assumptions and perspectives

A paradigm is a basic belief system based on ontological, epistemological and methodological assumptions (Stack, n.d.:30).

1.5.3 Ontological assumption

A positivist approach was followed in the conducting of the research. This ontology believes that there is a single objective reality to any research phenomenon or situation, regardless of the researcher's perspective or belief (Hudson & Ozanne, 1988:508-521). It is also important in positivist research to seek objectivity and to consistently use rational and logical approaches to research (Carson, Gilmore, Perry & Gronhaug, 2001).

When applied to the current proposed research, a viewpoint was taken that the legislation and incentives can universally be applied to all countries, which means that the legislation is not made subjectively for a specific country. All laws can universally be applied to all countries.

1.5.4 Epistemological assumption

The IGI Global Dictionary (2017) defines a positivists as someone who assumes that only "facts" derived from the scientific method can make legitimate knowledge claims. It also assumes the researcher is separate from and not affecting the outcomes of research.

When applied to the proposed research, the legislation is taken as fact since it cannot be changed and has to be applied as it is. The researcher is separate from the study and does not influence the outcome and can only present the facts found during the research.

1.5.5 Methodological assumptions

Methodology is “the strategy, plan of action, process or design lying behind the choice and use of particular methods and linking the choice and use of the methods to the desired outcomes” (Crotty, 2003:3).

Qualitative research was conducted in a positivist’s paradigm.

The goal in conducting quantitative research study is to determine the relationship between one thing: “an independent variable”, and another: “a dependent or outcome variable” within a population. Quantitative research designs are either descriptive or experimental. A descriptive study establishes only associations between variables; an experimental study establishes causality (Babbie, 2010:16).

This study is a descriptive quantitative research. This methodology is appropriate for the proposed study because the study seeks to understand the relationship between the tax incentive available for R&D and the actual R&D performed by the country.

The following methodological assumptions were taken into account:

- There is no limitation of resources to perform R&D.
- There is no restrictions on the R&D that can be performed.
- The R&D incentive is available to all taxpayers.
- The different legislations are comparable.

1.5.6 Limitations of the study

The study has a few limitations. Firstly, only income tax incentives were considered in the study, but not in conjunction with other taxes. Secondly, the study did consider the political environment with regard to R&D, but only in the context of the applicable legislation. Thirdly, the decision to embark on R&D is not solely based on tax incentives, though this study only focused on the tax incentives. Fourthly, only countries with developing economies were considered for the study, and lastly it should be mentioned that information relating to R&D in foreign countries is not readily accessible.

1.6 OVERVIEW

Chapter 1: Introduction and background of research

This chapter introduces the proposed research and the outline of the paradigm in which the research will be conducted. The problem statement and objectives of the research are presented.

Chapter 2: The South African tax incentive for R&D, section 11D of the Act, is analysed

This chapter analyses the provisions of section 11D. The chapter analyses section 11D with emphasis on understanding the details of section 11D and its practical applications. This chapter addresses the secondary research objective as identified in par 1.4.2(i).

Chapter 3: The Brazilian and Chinese tax incentive for R&D are analysed

This chapter comprises an analysis of tax incentives for R&D in Brazil and China. The chapter analyses the tax incentives with emphasis on understanding and explaining the details of the incentive and its practical applications. This chapter addresses the secondary research objective as identified in par 1.4.2(ii).

Chapter 4: Comparison of the different sets of legislation

This chapter compares the incentives of the countries as discussed in chapters 2 and 3. This will be achieved by a one-on-one comparison of the three countries' incentives identified. This chapter addresses the secondary research objective as identified in par 1.4.2(iii).

Chapter 5: Summary and conclusion

The findings are presented and summarised in this chapter. An assessment is made as to how the research problem has been answered. The limitations of the study are considered and suggestions with respect to possible future research are made. This chapter addresses the secondary research objective as identified in par 1.4.2(iv).

CHAPTER 2: AN ANALYSIS OF THE SOUTH AFRICAN TAX INCENTIVES FOR R&D

2.1 Introduction

This chapter provides a detailed analysis of the income tax incentives available in South Africa, as identified in the secondary research objective in par 1.4.2(i). The analysis provides an in-depth understanding of the incentives available in South Africa and forms a basis for the comparison with the incentives available in Brazil and China.

2.2 The South African tax incentives for R&D

Section 11D of the Act was introduced by the government of South Africa in the year 2006 in order to try and boost investment in R&D by the private sector (National Treasury 2006:6). The section replaced the old section 11B that dealt with the deductions for R&D.

The main reason for replacing section 11B with 11D, according the Finance and Accounting Services Sector Education and Training (FASSET, 2007:48), is that the South African tax laws for R&D did not provide substantial incentives for South African companies to be able to compete globally. South Africa needed an improved set of R&D incentives to compensate for costly R&D expenditure.

According to Paluch, pharmaceutical R&D was being rejected and all software R&D was classified as relating to internal business processes and therefore excluded from the incentive. The business community felt that the interpretation of the legislation was looked at too narrow or, in fact, that the legislation itself was too narrow. For example, approximately 70% of R&D from software development companies was rejected by the Department of Science and Technology (DST) (Paluch, 2015).

The old section 11D did not have a definition for the term R&D, and thus the introduction of the definition in the new section was a welcomed change to the section (La Grange, 2012).

According to La Grange, the definition of R&D in the new section largely captures the activities included in the old section and also expands the scope of the incentive to certain pre-existing products and processes. R&D is defined as follows (La Grange, 2012):

- Systematic investigative or experimental activities of which the result is uncertain for purpose of discovering non-obvious scientific/technical knowledge, or creating an invention, a registerable design, a computer programme (as defined in the relevant

Intellectual Property legislation) or knowledge essential to the use of such invention, design or computer programme; or

- developing or significantly improving any qualifying invention, design, computer programme or knowledge if such development or improvement relates to any new or improved function or improvement of performance, reliability or quality.

Some specific exclusions are built into the requirement of the section. The following expenditure is excluded from the scope of section 11D (La Grange, 2012):

- administration, financing, compliance or similar functions;
- market research, market testing or sales promotion;
- routine testing, analysis, collection of information or quality control in the normal course of business;
- development of internal business processes, unless such processes are mainly intended for sale or for granting the use or right of use thereof;
- oil and gas or mineral exploration or prospecting, except R&D carried on to develop technology used for that exploration or prospecting; and
- creating or development of financial instruments or financial products.

According to La Grange (2012), the old section 11D did not have a definition for the term “internal business process”. SARS has, in the past, followed a narrow interpretation of the term. The exclusion of the processes which are developed for the sake of granting the right of use has thus been a welcome amendment.

2.2.1 Section 11D – Allowable deductions for R&D costs

Sub-section 11D(2) of the Act sets out the conditions under which R&D costs are deductible and it states the following:

A company is entitled to deduct from income 150 % of actual expenditure directly and solely incurred in South Africa on R&D during the year of assessment when computing their taxable income. The expenditure must have been incurred by the company in the production of income whilst carrying out a trade. DST approval is required before any expenditure can be claimed.

As stated in sub-section 11D(2), this incentive is only available to taxpayers who are companies. Natural persons in their individual capacities cannot benefit from the incentives provided by this section, thus individuals have to register and trade through a company if they want to enjoy these benefits.

2.2.1.1 Exclusions

Sub-section 11D(2) continues to exclude the costs incurred in respect of immovable property, machinery, plant and implements, excluding pilots created solely for the purpose of the process of R&D and that a plant that will not be used for production purposes after R&D. These costs, therefore, do not qualify for a deduction under this section; that being said, only costs for pilots and prototypes solely created for the purpose of R&D and not used for production after the R&D project has been completed, will qualify for the deduction under this section.

Sub-section 11D(7) excludes all monies received or recovered by the company from any sphere of government, including state owned entities in relation to funding the company's R&D projects.

The exclusion exists to prevent the taxpayers receiving a double benefit of receiving free funding and still claiming a deduction on it.

2.2.1.2 R&D Funding

In terms of sub-section 11D(4), a company that bears the costs of R&D performed by another entity is entitled to claim the 150% deduction on the actual cost of funding, provided that the entity performing the R&D is a company exempt from tax in terms of the Act, or it is the Council for Scientific and Industrial Research, or it is a company that forms part of the same group of companies, as defined by the Act, and that the entity performing R&D does not claim the R&D deduction.

2.2.1.3 Approval of R&D by the DST

Sub-section 11D(9) grants the Minister of the Department of Science and Technology (DST), or a person appointed by the minister, the right to approve any R&D being carried out or funded for the purpose of a deduction - based on whether the entity performing R&D has proved to the R&D committee that its R&D meets the definition of R&D as per sub-section 1 and any other regulation the minister may prescribe.

It is further stated in sub-section 10 of the Act that the Minister of the DST, after taking into account the recommendations of the R&D committee, has the right to withdraw the approval granted in respect of the R&D deduction if there are material changes to the R&D project that could have affected the approval of the project, or if the company fails to submit the annual report to the R&D committee, or if the company is found guilty of fraud, misrepresentation or non-disclosure of material facts that could have affected the approval of the R&D project.

2.2.1.4 The R&D approval committee

Sub-section 11D(11) allows the Minister of Finance and the Minister of the DST to appoint members to the approval committee. The Minister of Finance can appoint three individuals employed by the South African Revenue Services (SARS) and one individual employed by the National Treasury, whilst the Minister of the DST can only appoint three individuals employed by the DST.

According to KPMG (2015:2), the response time from the committee was too long, resulting in many companies not being able to utilise the benefit since the year of assessment - in which the costs were incurred - would close before they got a response from the committee. This resulted in the authorities amending section 11D with the addition of sub-section 11D(20).

2.2.1.5 Reduced assessment

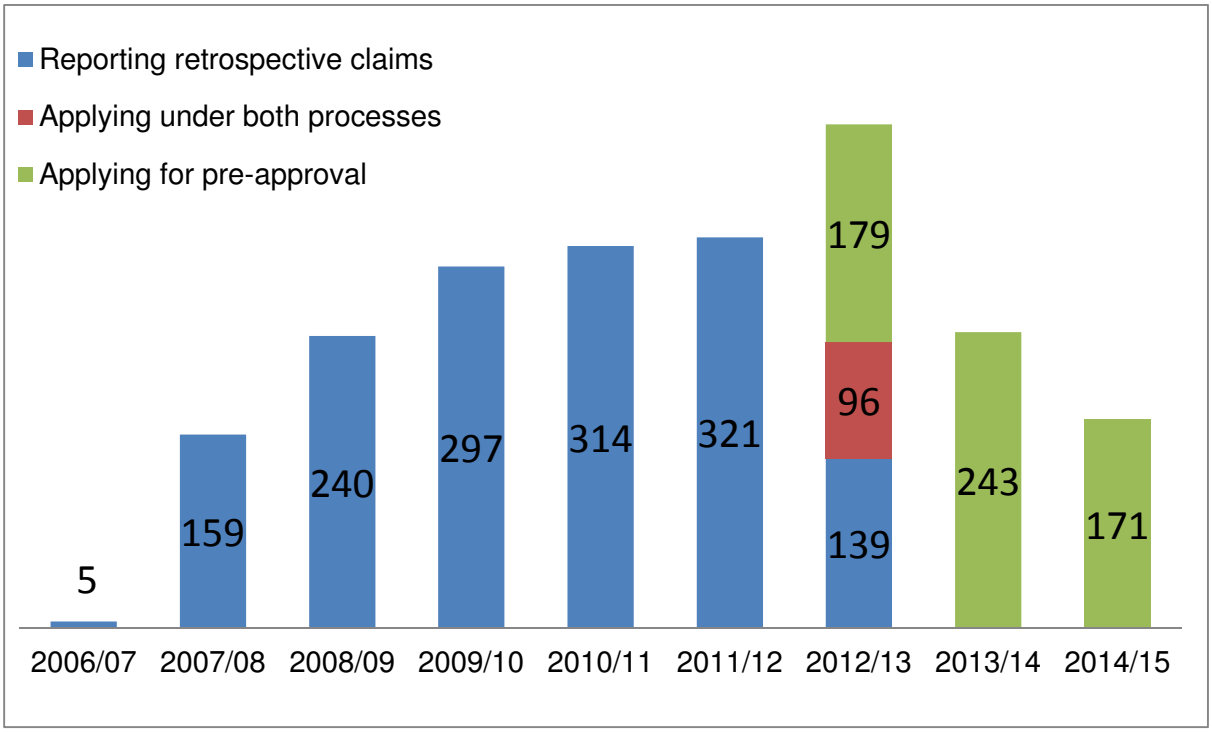
Sub-section 11D(20) of the Act addresses the problem identified above by giving the commissioner of SARS the power to make a reduced assessment for a year of assessment, where expenditure incurred during that year in respect for R&D was not claimed as a deduction - due to the approval being received late - provided that all the other requirements of section 11D have been met and the expenditure in respect of that R&D has been incurred on or after the date of receipt of an application by the DST for the approval of that research and development.

Therefore, as can be seen from the above, a taxpayer can apply to SARS for a reduced assessment in order to be able to take advantage of the R&D deduction that was approved, even if approval in terms of sub-section 9 was granted after the year in which the R&D costs were incurred.

2.2.1.6 Administration and effectiveness of the incentive

According to Mashamba (2015:10), about 260 companies on average took part in the R&D programme per year between 2007/08 and 2014/15. The table below shows the number of companies taking part in the R&D incentive programme.

Figure 2-1: Companies taking part in the South African R&D tax incentive programme



Source: Adapted from Mashamba (2015:10)

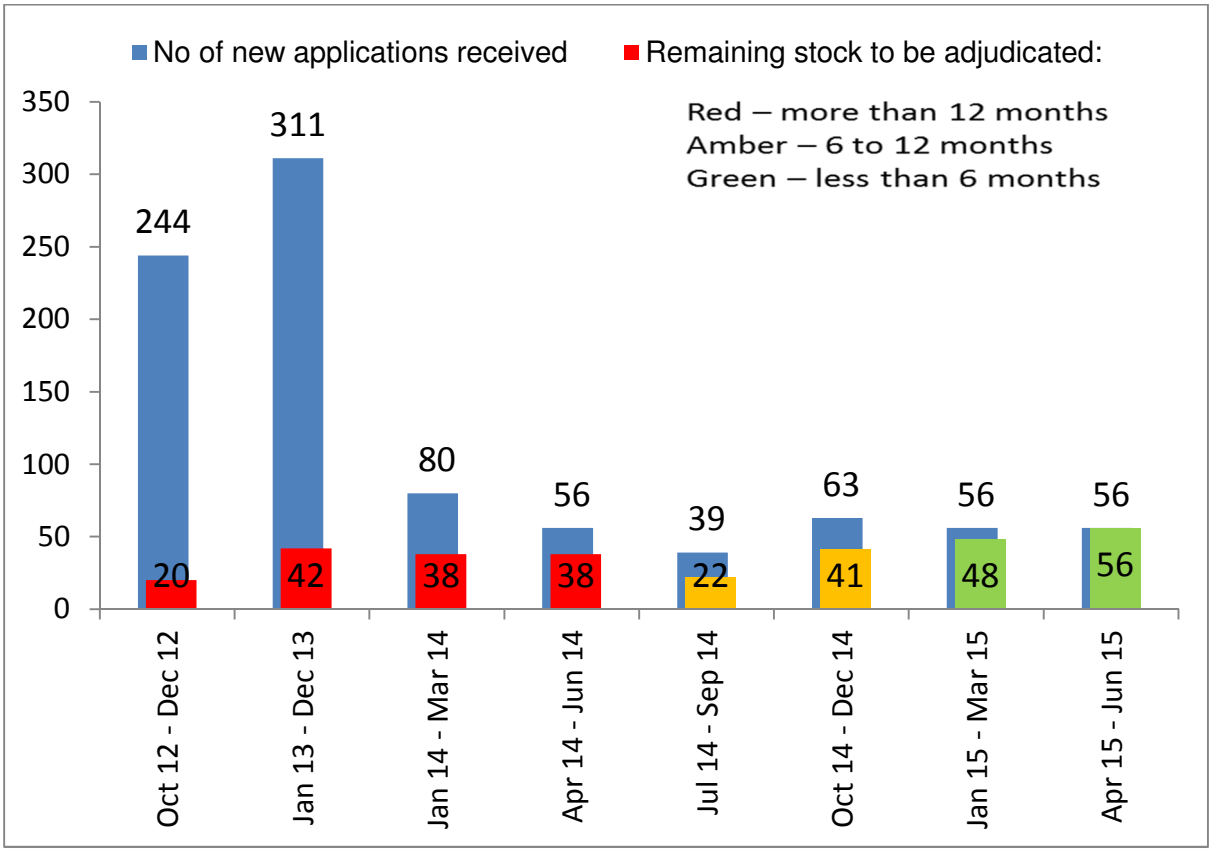
Upon introduction of sub-section 11D(20), companies were afforded three options that could be used to apply for the incentive (Mashamba, 2015:10), namely:

- Reporting retrospective claims – this was R&D costs incurred in the years of assessment prior to the introduction of sub-section 11D(20) and where companies could not get a deduction due to the late response by the approval committee.
- Applying under both processes – this was for companies applying for retrospective claims and for pre-approval claims.
- Applying for pre-approval – this is for R&D costs incurred after the introduction of sub-section 11D(20).

The number of companies applying for the R&D incentive decreased from the 2012/13 year going forward. This could perhaps be attributed to the fact that the process of the finalising and approving of projects already submitted to the DST was very slow.

The table below shows the status of applications received and those that were still to be adjudicated by the committee, as at June 2015.

Figure 2-2: The number of applications received for the R&D tax incentive vs the number of applications still to be adjudicated.



Source: Adapted from Mashamba (2015:15)

The table above indicates that, by June 2015, there were still 62 applications that had been received one and a half years before and that were still to be adjudicated by the committee, bearing in mind that after the adjudication, the Minister of the DST still had to make a final decision on the application.

Based on the information above, it could be concluded that the adjudication committee had a relatively major backlog on the adjudication of the R&D applications, and that could have been the result of the lesser applications submitted by companies going forward.

According to Mjawara (2017:7), the R&D incentive programme shows an improvement in the work done by the adjudication committee, as at 18 May 2017 the status indicated that 88% of the 1 169 applications had then been adjudicated, with only 1% of the applications in backlog, i.e. those applications received between October 2012 and December 2015 .

The table below summarises the status as at May 2017.

Table 2-1: Status of the R&D tax incentive programme as at May 2017

	Oct 2012 – Dec 2015	Jan 2016 – Dec 2016	Jan 2017 to date	Total	As a % of valid applications
Applications received	991	140	69	1 200	
Withdrawn by Applicants	30	1	0	31	
Valid applications	961	139	69	1 169	100%
Applications adjudicated	952	75	0	1 027	88%
Still to adjudicate	9	64	69	142	12%
Final decision letters sent to applicants	757	43	0	800	68%
Adjudicated (require a submission to the Minister to sign off)	195	32	0	174	15%

Source: Adapted from Mjwara (2017:7)

From the above table it can be seen that the adjudication status as of May 2017 was at 88% of the 1 169 valid applications received, with only 1 % still in backlog with regard to applications received from October 2012 to December 2015. This indicates great improvement by the committee on the adjudication of applications (Mjawara, 2017:7).

The committee still has quite some work to do to eradicate the backlog on applications received after January 2017. The minister also has 142 applications, received up to December 2015, that still needed to be signed off.

2.2.1.7 Annual reporting

In terms of sub-section 11D (13) of the Act, the taxpayer must report annually to the committee regarding the progress of the R&D, also whether the R&D requires any specialised skills. All this should be done within 12 months of the end of the year of assessment. The first report is required one year after approval has been first granted.

On the other hand, the Minister of the DST has to inform the commissioner of SARS of any approved R&D in terms of subsection 16, giving the commissioner all information required to enable him/her to determine the deduction that the taxpayer is entitled to for the R&D performed, and must also inform the commissioner of any withdrawals of previously approved R&D projects.

The Minister of the DST has a responsibility, in terms of sub-section 17 of the Act, to submit an annual report to Parliament advising it of the direct benefits of the R&D in terms of economic growth, employment and other broader government objectives and aggregate expenditure in respect of such initiatives.

Sub-section 19 of the Act grants the commissioner of SARS the right to raise an additional assessment, for any year of assessment, regarding a deduction in respect of R&D which has been allowed, or where approval has been withdrawn in terms of sub-section 10.

The process of approval for the incentive is tedious and takes a considerable amount of time. There are a number of governmental departments involved in the process (DST, National treasury and SARS). This involvement also adds to the delay of the process. The incentive itself is favourable, however, if the process of obtaining the incentive was more efficient, more companies could have benefitted from it.

2.2.1.8 Financial support

The government offers financial grants to private sector companies that invest in the creation, design and improvement of new products processes. The grants are classified into two categories, grants for small R&D projects and grants for large R&D projects. The grants for small R&D projects is capped at maximum of R5 million and for large R&D projects and for large R&D projects the minimum is R10 million (GII, 2015).

2.2.2 Capital expenditure

As already stated under par 2.2.1, the deduction of costs incurred in respect of immovable property, machinery, plant and implements used for the purpose of R&D is not within the scope of section 11D. Sections 12C and 13 of the Act govern the deductions of such costs.

2.2.2.1 Machinery or plant used for R&D purposes

Section 12C(1)(gA) of the Act states that, in respect of any new or unused machinery or plant which is owned or acquired by a taxpayer as purchaser in terms of an instalment sale agreement and is first brought into use by that taxpayer for purposes of R&D, a 20% deduction of the cost to that taxpayer to acquire that machinery, plant, implement, utensil or improvement shall be allowed in the year of assessment during which the asset is first brought into use, and in each of the four subsequent years of assessment in which the assets are still in use.

If the assets are acquired on or after the 1st of September 2012 and used for R&D purposes then, in terms of subsection 12C(1)(gA)(b), it qualifies for a deduction of 50% in the first year of assessment, 30% in the second year and 20% in the fourth year. This reduces the write-off period to only 3 years, as opposed to the 5 years in section 12C(1)(gA).

The capital allowances on machinery and plant for R&D are favourable, as compared to the general capital allowances available for other taxpayers. To be able to deduct the costs over three years is more advantageous than to deduct costs over four or five years, and a deduction of 50% of the costs in the first year will help improve the cash flow of the R&D project.

2.2.2.2 Buildings

Buildings used for R&D purposes qualify in terms of subsection 13(1) of the Act for an annual 5% deduction of the cost to the taxpayer of the building, the erection of which was commenced on or after the 1st of January 1989, if the building is used wholly or mainly by the taxpayer for the purpose of carrying out any process of R&D.

There is no additional deduction for buildings used in R&D as the 5% deduction provided by section 13(1) applies to other buildings used in normal manufacturing. Buildings are amongst the most expensive assets used and the legislators could look into making a specific provision in the legislation for buildings used for R&D projects.

2.2.3 Conclusion

In summary, the following tax incentives are available in South Africa for R&D purposes:

- 150% deduction of actual expenditure incurred solely and directly for the purpose of R&D;
- 50% of actual capital expenditure incurred for obtaining machinery or plant solely and directly for the purpose of R&D in the first year of assessment that the costs were incurred, 30% in the second year of assessment and 20% in the third year of assessment, provided that assets purchased or improved are new and unused;

- In the event that the machinery or plant purchased are not new or unused, only 20% of the cost incurred is allowable as a deduction per year of assessment;
- An annual 5% deduction of the cost incurred by the taxpayer on a building used solely or mainly for R&D purposes.

The incentives mentioned above are generous given that, at a rate of 150%, the companies are claiming more that they have actually spent on R&D projects. The number of companies whose R&D projects are annually approved is very low, as is evident from the annual reports to the standing committee on finance. There is a backlog that the R&D committee still has to clear coupled with the fact that the minister also has a backlog of R&D projects that were adjudicated by the committee but that were still awaiting the minister's signature. The South African companies embarking on R&D projects can benefit a lot more if the internal process of approving the R&D projects can be improved.

It could therefore be concluded that the tax incentives for South African R&D are found to be beneficial but - as it was also seen from results obtained - that the nature of the system might be responsible for deterring companies to apply for the incentive. A more efficient management of the process to enter into the system could encourage more companies to embark on the process to apply for the benefits.

The following chapter is an analysis of the Brazilian and Chinese income tax incentives available for R&D in these respective states.

CHAPTER 3: AN ANALYSIS OF THE BRAZILIAN AND THE CHINESE TAX INCENTIVE FOR R&D

3.1 Introduction

This chapter provides an analysis of the income tax incentives available in Brazil and China as per the research objective identified in par 1.4.2(ii). This was achieved by studying the relevant provisions in the Brazilian and Chinese tax laws and by looking at any relevant literature available that provides commentary on the incentives.

The above was performed to determine what provisions and incentives are available in these countries in order to be compared to those available in South Africa, which will be addressed in the next chapter.

Firstly the Brazilian tax incentives will be considered and thereafter those of China.

3.2 The Brazilian tax incentives for R&D

Law No. 11.196/ 05 (the Law) was introduced to the Brazilian tax system in 2005. The Law, also known as the "Law of Good", creates tax incentives for companies that engage in research and technological innovation development (PASELI, 2015). It provides technological innovation companies with good opportunities to reduce their tax costs, considering their investments in research, development and innovation (PASELI, 2015).

Article 17(1) of the Law defines technological innovation as "the design of a new product or process of manufacture, as well as the aggregation of new functionalities or characteristics to the product or process that implies incremental improvements and effective gain of quality or productivity, resulting in greater competitiveness in the market".

The definition can be divided into three groups and interpreted as follows (Zimmer, Iara, De Souza & De Almeida Cunha, 2016:40):

- **Basic Research** - consists of experimental or theoretical work undertaken primarily in order to acquire new knowledge of the fundamentals of observable phenomena and facts, without considering an application or a particular use.
- **Applied research** - is the creation of original works with the purpose of acquiring new knowledge; especially directed at a goal or a certain practical purpose.
- **Experimental development** - is to do systematic studies based on pre-existing knowledge, obtained through research and / or practical experience, with a view to

manufacturing new materials, products or devices, processes, systems and services or considerably improve existing ones.

Ernst and Young summarised the definition of Brazil's R&D process as follows (Ernst & Young, 2014:32):

- "Technological innovation" refers to the design of a new product or manufacturing process and addition of new functionalities or characteristics to the product or process that leads to incremental improvements and an effective quality or productivity gain.

- "Product innovation" refers to the improvement of new and/or existing products in the domestic or international markets.

- "Enhanced R&D activities" refers to basic research, applied research, experimental development, basic industry technology and technical support services.

3.2.1 Deductions for expenditure incurred for R&D purpose

Brazilians benefit from a range of relevant tax incentives, including federal tax deductions, specific financing and additional state level incentives. The entities carrying out technological R&D activities in view of ultimately increasing their productivity are automatically granted federal tax incentives (Magalhaes & Dias, 2013).

3.2.1.1 Qualifying costs

Article 17(2) of the Law also includes the following costs as technological innovation costs: expenditure on technological research and innovation development that is outsourced to contractors in the country by a university, research institution or independent inventor, provided the legal person ultimately takes responsibility for the risks and control of the R&D.

According to Zimmer *et al.,* (2016:40), most activities undertaken to achieve technological innovation qualify for the R&D tax incentives. The following costs qualified for a deduction:

- payroll expenses
- materials
- machinery and equipment
- raw materials for testing
- part of the qualified expenses amounts incurred for contracted technical services, such as laboratory trials and testing, provided the taxpayer does not participate in the execution of the services (even if partially) and

- specific training for the project.

The following costs are not eligible for the R&D deduction (Deloitte, 2015:8):

- Expenses related to the support of administrative and indirect services, even if they can be associated with a research project. Such expenses include security, cleaning, maintenance, library and documentation services, as well as coordination, administration and financial monitoring of research projects.

3.2.1.2 Super deduction

The following deductions are available, as per article 19(1) and 19(2) of the Law, to Brazilian companies with eligible R&D expenditure incurred (PWC, 2012:3):

- entities can deduct 160% of the expense incurred;
- the deduction increases to 170% if the entity increases the number of researchers by up to 5% in a given year;
- if the entity can manage to increase the number of dedicated researchers by more than 5%, the deduction increases to 180% of the total costs incurred.

3.2.1.3 Specific deduction for patents

Companies developing patents qualify for an extra 20% deduction for the cost incurred in terms of article 19(3) of the Law. The deduction is only available if the patent is registered in Brazil. Few taxpayers benefit from this deduction, since it is delayed until the patent is registered (PWC, 2012:2). It is worth noting that deductions not claimed in a particular year may not be carried forward to the following years (Magalhaes & Dias, 2013).

Therefore most companies lose out on the incentive if the patent is not registered or if it is registered in another state and not in Brazil.

3.2.1.4 Capital expenditure

Article 17 of the Law governs the deductibility of costs incurred for the acquisition of machinery, equipment and instruments, and it grants to the taxpayer a deduction of 100% of the cost of acquisition - in the year of acquisition - for newly acquired machinery, equipment and instruments dedicated solely for R&D purposes. Intangibles are also eligible for the 100% deduction (Deloitte, 2015:8).

A federal excise tax is imposed on all machinery, equipment or tools imported. Machinery, equipment or tools imported for the sole purpose of R&D qualify for a reduction in the federal

excise tax of 50%. This incentive should be claimed at the time the related assets are acquired (Deloitte, 2015:8).

The capital incentive is quite advantageous in that deducting 100% of the cost in the first year will help improve the cash flow of the company, and the cash can be used to fund the R&D project. The reduction of excise duties by 50% will also improve the cash flow and profitability for the project. A disadvantage is that there is no deduction for costs incurred on buildings where R&D is performed.

3.2.2 Financial support

The government offers financial support to new R&D investments by Brazilian entities. Financial assistance can be provided for up to 90% of the total funding of the R&D project. This is the only incentive that requires pre-approval from the government (Ernst & Young, 2014:33).

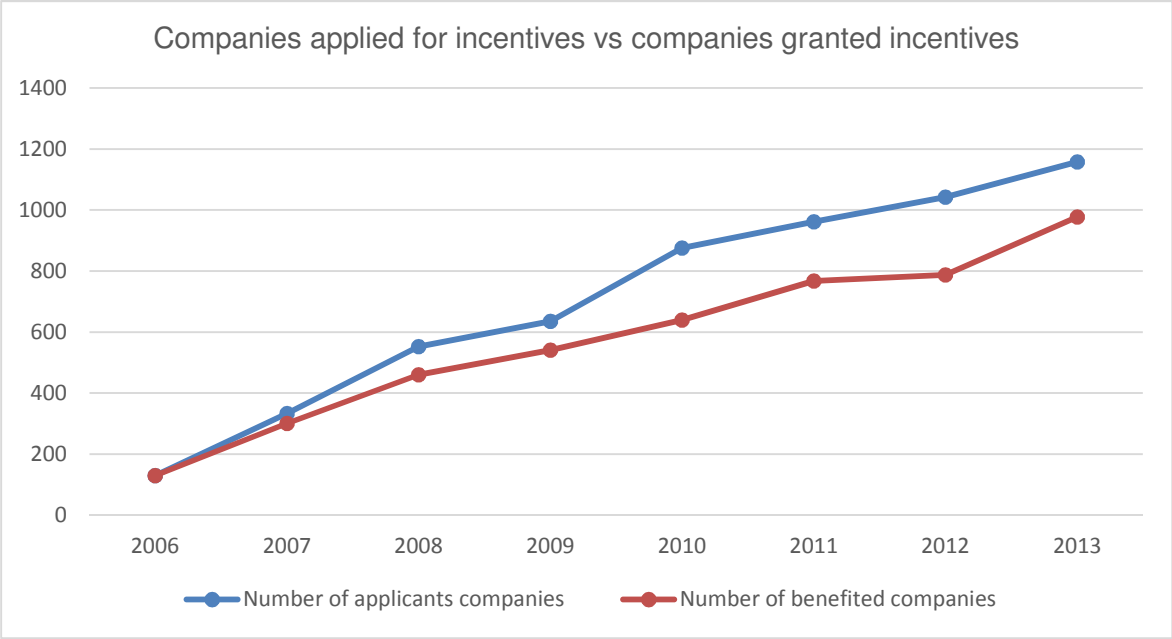
As per article 21 of the Law, remuneration for researchers with a master's or doctoral degree, employed in technological innovation activities, can be subsidised with up to 60% for entities operating in the Sudene and Sudam areas, and 40% for entities operating in the rest of the Brazilian areas.

R&D projects can go on for years before the company can actually make any profit, while incurring expenses on the project, the funding and subsidies by government could help absorb the cost of the project before the project starts to earn profits.

3.2.3 Administration and effectiveness of the incentives

Brazil offers a number of attractive tax incentives, as already discussed, but they would not be of any good to any entities if the administration and implementation thereof is not effective. The table below shows the number of companies that applied for the R&D incentive, vs those that actually benefited from the incentive.

Figure 3-1: Companies that applied for the R&D tax incentive vs those who got granted the incentive



Source: Adapted from Zimmer *et al.* (2016:41)

As can be seen in the figure above, the number of companies actually benefiting from the incentive has been deteriorating from 2006 to 2013. This, according to Zimmer *et al.* (2016:41), is due to the incentive only being available to companies using the real profit tax system. Only a small number of companies use the real profit system, thus the benefit is limited to only those few.

3.2.4 Other matters to consider

3.2.4.1 Pre-approval

There is no pre-approval required to claim any incentives with regard to R&D expenditure, apart from the financial support incentive (Ernst & Young, 2014:33) as considered above in par 3.2.2.

This is great for the entities performing R&D, since they do not have to waste valuable time waiting for the government to approve their projects and it also alleviates the administrative burden of applying for the incentive.

3.2.4.2 Tax system

The incentives mentioned in this study are only available when using the *Lucro Real* (actual profit method) tax system. Under this system, the entity is required to be making a profit in the particular year that it wishes to take advantage of the incentive (Deloitte, 2015:8).

This can be detrimental to some companies, given that they can operate for a number of years without making a profit; in that case they will lose out on the R&D incentives.

3.2.4.3 Tax clearance certificate

Companies claiming any of the incentives should have a valid tax clearance certificate for the full period they are claiming for (Ernst & Young, 2014:33). In October 2014 the Ministry of Finance introduced a new unified tax clearance for Brazilian taxpayers which will only be valid for 180 days (Floriana, n.d.). According to Floriana, it is becoming more cumbersome and expensive for taxpayers to obtain tax clearance.

The tax clearance is only valid for half a year at a time, which means that taxpayers have to apply for a tax clearance certificate twice every year. This increases administrative pressure and costs on the taxpayers.

3.2.5 Conclusion

The objective of this chapter was to analyse the tax incentive for R&D in Brazil and its practical applications. Through research, it was found that the Brazilian tax system has multiple tax incentives for R&D purposes. In a nutshell, the following is available for entities conducting R&D in Brazil:

- A deduction of 160% to 180% of actual expenditure incurred;
- An extra 20% deduction when the cost is related to developing a patent, provided the patent is registered;
- A 100% deduction for costs incurred on acquisition of machinery, equipment and instruments in the year that the cost was incurred, including intangible assets;
- A 50% reduction of excise tax due on importing assets when they are imported for R&D;
- Funding of up to 90% of the total R&D costs;

- Subsidies for the salaries of researchers who possess a Master's or Doctoral qualification, 60% subsidy for researchers working in the Sudene and Sudam and 40% subsidy for researchers working in other areas of Brazil.

The tax incentives for R&D available to the Brazilian companies are very generous, but the low uptake by companies suggests that incentives might not be easily accessible. Through research conducted, it was indicated that only 52% of companies in a population of 100 knew about the incentives and were interested in applying for them, and 46% of the companies surveyed listed lack of qualified personnel on the incentives as deterrent for using the incentives (Zimmer *et al*., 2016:43).

The next section deals with the analysis of the Chinese tax incentives for R&D.

3.3 The Chinese tax incentives for R&D

3.3.1 Introduction

The second section of this chapter provides a detailed analysis of the income tax incentives available in China as per the secondary research objective identified in par 1.4.2(ii). The objective was to analyse the Chinese income tax incentives for R&D purposes. This is achieved by studying the relevant provisions of the Chinese tax laws and looking at any relevant literature available that provides commentary on the incentives.

The above was performed to determine what provisions and incentives are available in China in order to be compared to those available in South Africa and Brazil, which will be addressed in the next chapter.

R&D incentives have been available in China for many years and the laws have been improved throughout the years (Ernst & Young, 2014:46).

Circular 119 of the Enterprise Income Tax Law (EIT) of the Peoples' Republic of China was introduced in 2015 to help simplify the provisions of the EIT governing R&D tax deduction for companies operating in China.

3.3.2 Super deduction

R&D is defined as follows in terms of circular 119: "Systematic activities with clear objectives for the acquisition of new knowledge of science and technology, creative use of new knowledge of science and technology or substantial improvement of technology, products (services) and technology".

In terms of the circular, a super deduction is available for Chinese companies conducting R&D on qualifying expenses incurred by that company for R&D purposes - for new technology, products and production techniques. The super deduction is as follows (Deloitte, 2015:12):

- The entity is entitled to claim a deduction of 150% of expenditure incurred on qualifying R&D expenditure.
- For R&D expenditure that resulted in intangible assets: those assets are amortised based on a cost of 150% of the actual cost incurred in developing the asset, but the amortisation period cannot be less than ten years unless otherwise stipulated by law.
- Any R&D costs that cannot be deducted in a specific year of assessment, due the company making a loss, can be carried forward up to a maximum of five years.

3.3.3 Qualifying costs

The circular provides guidance on the deductibility of R&D expenditure and lists the costs that automatically qualify for the R&D super deduction. The cost items are listed below (Ernst & Young, 2014:49):

- design expenditures for new products; expenditures for formulating new techniques and procedures; expenditures for technical books and materials, including translation expenditures, that are directly related to the R&D activities;
- expenditures of direct materials, fuel and power consumed during the R&D activities;
- wages, salaries, bonuses, subsidies and allowances for research personnel;
- depreciation or lease expenditures for equipment and devices used specifically for the R&D activities;
- amortization expenditures for intangible assets, such as software, patent rights and certain non-patented technologies used specifically for the R&D activities;
- expenditures incurred to develop and fabricate prototypes and trial models exclusively used for intermediate testing and experiment;
- site-testing expenditures for exploration activities;
- expenditures incurred on assessment, review, inspection and certification of research results;
- basic pension fund, basic medical insurance, work-related injury insurance, unemployment insurance, maternity insurance and housing fund contributed by a company for its employees, directly engaged in R&D activities in accordance with regulations set by the State Council or relevant provincial-level government authorities;

- costs of operational maintenance, adjustment, testing, and repair of tools and equipment, incurred exclusively for R&D activities;
- costs of samples and prototypes that do not constitute fixed assets, and expenses for general testing solutions;
- clinical trial costs for R&D activities for new drugs; and
- certificate costs for R&D results.

The list provided above is not exhaustive, but includes only the costs that automatically qualify for the R&D super deduction (Ernst & Young, 2014:49).

3.3.4 Disqualified costs

The circular has a specific list of activities whose associated costs are not eligible for the R&D deduction. The following activities are disqualified from the R&D super deduction (Johnson, 2016):

- routine product or service upgrades;
- application of publicly available scientific research and other R&D results;
- commercialization of technology support activities to customers;
- simple updates to, or duplication of, existing products, services, technologies, materials, or processes;
- market research or studies;
- processes related to regular quality control, test analysis, repair, and maintenance; and
- social sciences, arts, or humanities related studies.

3.3.5 Disqualified industries

The definition of R&D was found to be too vague and thus companies operating in certain industries are specifically excluded from the R&D tax incentives. The following industries do not qualify for the R&D super deduction as per circular 119 (Zhang, 2017):

- tobacco manufacturing;
- accommodation and catering services;
- wholesale and retail;
- real estate;
- leasing and business services; and
- entertainment.

3.3.6 High and New Technology Enterprises (HNTE)

The Chinese government introduced the preferential tax status of HNTE in the year 2008 to enterprises that work in special high technology areas and fulfil the innovation requirements as listed in the Administrative Measures for the Recognition of High and New Technology (Lutze, 2016). As Lutze stated, many companies - including foreign companies with R&D activities in China - were able to apply for this tax status successfully, which have effectively reduced the corporate tax from the normal 25% to 15% (Lutze, 2016).

To qualify for the HNTE status, a company must meet the following requirements (Lutze, 2016):

- The company must meet a certain ratio for its R&D expenditure over its total sales, depending on the value of the sales.
- The number of technical personnel engaged in R&D and relevant technological innovation works should be no less than 10% of the overall number of employees.
- The company to have obtained ownership of intellectual property rights for the key supporting functions of its main products (or services) through self-R&D, transfer/purchase, donation, merger and acquisition, etc.
- Evaluation of enterprises' innovation capacity to meet relevant requirements.
- No serious safety or quality accidents or serious illegal environmental activities for the immediately preceding year to have taken place at the time of the enterprises' application for accreditation.
- Annual declaration and payment receipt of corporate income tax for the past three years, relevant documents related to commercialization of technology findings and organization and administration on R&D, key technologies and technology indicators of high and new technology products (or services), certification and accreditation documents and related qualification certificates, etc.
- Accredited HNTE are required to make annual filings on the website of the Administration of Verification of HNTEs to disclose detailed information such as intellectual property, technology personnel, R&D expenditure and sales revenues in the immediately preceding year.
- Accredited companies have to re-apply for accreditation every three years.

3.3.7 Administration and effectiveness of the incentives

To be able to claim the tax benefits, the following needs to be submitted to the tax authority during the annual filing of the current income tax (Ernst & Young, 2014:51):

- R&D super deduction form in the annual filing package.

- Proposals and R&D expenses budgets.
- Headcount and name list of R&D professionals.
- R&D expense super deduction form which is used to record qualified R&D expenses, excluding those already booked as cost of intangible assets, actually incurred for a tax year.
- Relevant board resolutions or resolutions of general manager meetings.
- Contracts or agreements of relevant R&D projects.
- R&D project progress explanatory reports and research results reports.
- Other materials required by the in-charge tax bureau.

Pre-approval is no longer required under circular 119, but the R&D expenses must be properly accounted for by the enterprise in accordance with the Chinese national accounting system, calling for regular and annual verification of the expenses (Johnson, 2016).

According to Garcia, Yang, Ziang and Zheng, (2014), six years after the implementation of the HNTE policy it has facilitated increased investment in R&D projects performed by local and national companies. Small companies and large multinational innovators benefitted the most from this incentive. The following diagrams display the number of companies that applied for the HNTE accreditation and those that re-applied for the accreditation after the initial three year period had lapsed.

Figure 3-2: The comparison of applications in 2009 and re-assessment in 2012.

Source: Garcia *et al.* (2014)

Figure 3-3: The comparison of applications in 2010 and re-assessment in 2013.

Source: Garcia *et al.* (2014)

As it can be seen from figures 3-2 and 3-3 above, the number of companies applying for the HNTE status has been constantly decreasing for six years; so is the number of companies re-applying for the status. This, according to Garcia *et al.* (2014), might be attributed to the strengthening of HNTE audit processes by the government.

The HNTE policy is a very favourable incentive for companies performing R&D activities and has helped to increase spending on R&D by companies operating in China. It is, however, becoming more difficult to get accredited as an HNTE company as the years go by.

3.3.8 Conclusion

This section provided an analysis of China's tax incentive available for R&D projects to taxpayers in that state. The analysis makes it clear that China offers substantial monetary incentives to encourage innovation through R&D in those states. The incentives can be summarised as follows:

- A deduction of 150% on actual expenditure incurred on R&D.
- A deduction of 150% of actual expenditure incurred in the development of an intangible asset.
- A reduced corporate rate from 25% to 15% for entities qualifying for classification as HNTEs.

On the other hand, as was seen above, the strict conditions to access these incentives imposed by the government make it difficult for the companies to access the incentives - as shown by the decline in the re-accreditation of companies as HNTEs.

This chapter provided an analysis of Brazil and China's tax incentives for R&D projects available to taxpayers in these two respective states. It is clear from the analysis that both the states offer substantial monetary tax incentives for R&D projects undertaken in these states.

In chapter 4, a comparison of the R&D tax incentive regimes is performed in order to indicate any differences and to recommend any improvements that could be legislated in South Africa, for its tax incentives to be on par with the other BRICS member states.

CHAPTER 4: COMPARISON OF THE R&D INCENTIVES AVAILABLE IN THE THREE STATES

4.1 Introduction

In accordance with research objectives set out in chapter 1, this chapter provides a comparison of the R&D tax incentives available in South Africa, Brazil and China. The comparison is based on the R&D tax incentives identified in chapters 2 and 3.

4.2 Detailed comparison of the R&D tax incentives

The summarised tax incentives for R&D available in South Africa, as per chapter 2, are compared with tax incentives for R&D available in Brazil and China, as per chapter 3, in the table below.

Table 4-1: Comparison of the R&D tax incentive available in South Africa, Brazil and China

South Africa	Brazil	China
R&D expenditure A deduction of 150% of expenditure incurred for R&D is available.	**R&D expenditure** A deduction of 160% to 180% of expenditure incurred for R&D is available.	**R&D expenditure** A deduction of 150% of expenditure incurred for R&D is available.
R&D capital expenditure An accelerated deduction of 20% per year for new and or unused assets acquired for R&D purpose. For assets acquired on or after the 1st of September 2012, the accelerated deduction is increased to 50% of the acquisition costs in the 1st year, 30% in the 2nd year and 20% in the 3rd year.	**R&D capital expenditure** A deduction of 100% of the costs incurred for the acquisition of machinery, equipment and instruments, including intangibles for R&D purposes, is available in the year of acquisition. There is no deduction for costs incurred on buildings.	**R&D capital expenditure** A depreciation and amortisation of 150% of the costs incurred for the acquisition of equipment, devices and intangibles for purposes of R&D. The period over which the deduction can be used cannot be less than 10 years.

	Costs incurred for the development of a patent that is registered in Brazil qualifies for an extra deduction of 20% on top of the initial 160% to 180%. Thus for patent development a deduction of up to 200% of the costs is available.	There is no specific deduction for costs incurred on development of patents.
	Machinery, equipment or tools imported for R&D purposes qualify for a 50% reduction in IPI.	
R&D funding Funding by the government is available for different categories of R&D performed. For small R&D projects grants of up to R5 million are available and for large R&D projects grants starting form R10 million are available.	**R&D funding** Funding by the government is available for up to 90% of the R&D cost. Subsidies are available for researchers' salaries for up to 60% for those working in the Sudene and Sudam areas, and 40% for those working in the rest of Brazil, only for researchers who possess a master's of doctoral qualification.	**R&D funding** N/A
Entity specific incentive N/A	**Entity specific incentive** N/A	**Entity specific incentive** Entities that qualify as HNTEs are taxed at a lower

		tax rate of 15% compared to the standard tax rate of 25%
Administration and effectiveness of the incentive South Africa is struggling with a backlog of applications for R&D that have not been assessed as yet. Although the adjudication committee has improved in adjudicating the backlog, there are still applications, dating as far back as three years ago, that have not been assessed yet. This has resulted in a decline of new applications being made by companies.	**Administration and effectiveness of the incentive** Lack of information has resulted in most Brazilian companies not being able to benefit from the available incentive. Most companies eligible for the incentive did not know about the incentive. Some companies sighted lack of knowledgeable and qualified personnel as a deterrent from taking advantage of the incentive.	**Administration and effectiveness of the incentive** China has experienced a decline in companies re-applying for the HNTE status. This is mostly attributable to the government imposing more stringent rules on auditing the companies' HNTE status.

Source: Author's own compilation from sources above

The following realities were identified based on the comparison provided in Table 4-1 above:

- The R&D tax allowance for expenditure for South Africa is the same as the Chinese super deduction for R&D at 150%, with Brazil having a slightly higher deduction rate of between 160% and 200%.
- For capital expenditure, all three states have different incentives. South Africa offers 100% deduction for capital expenditure over a period of three years, apart from buildings that only get 5% deduction per year. Brazil also offers 100% deduction, but the deduction is allowed in full in the year of acquisition of the assets; whereas China provides for a deduction of 150% for intangible assets, but the deduction cannot be for a period of less than ten years.
- Brazil offers an extra 20% deduction on costs incurred for the development of a patent that is registered in Brazil; the other two states do not have a similar incentive.

- Brazil also reduces the IPI on imported assets for R&D purposes by 50%; the other two states do not have a similar incentive.
- There is a R&D funding incentive in Brazil where R&D can be funded by the state for up to 90% of the total R&D cost. The government also offers subsidies for salaries of researchers that has a master's or doctoral qualification and who are engaged in R&D for between 40% and 60% of the salary cost, depending in which state they conduct their R&D.
- China offers a reduced tax rate of 15%, as compared to the standard 25% company tax for companies operating as HNTEs; the other two states do not have a similar incentive.
- All three states have their own different issues when it comes to the administration of their R&D incentive process, ranging from approval processes being long, to companies not knowing about the incentive and governments imposing stringent rules to the incentives.

4.3 Conclusion

Based on the comparison made above, it is clear that the three states have a variety of R&D tax incentives, some of which are similar and some of which are different. It is evident from the comparison that Brazil and China have superior tax incentives as compared to those that are available in South Africa, especially the HNTE programme and the 150% depreciation on costs for equipment, devices and intangibles in China, the 200% deduction on cost for patents and subsidies available in Brazil. Based on the findings highlighted in this chapter, it could be stated that South Africa can learn a lot from Brazil and China in terms of R&D incentives, which could be introduced to support innovation in the country.

CHAPTER 5: SUMMARY AND CONCLUSION

5.1 Introduction

Section 11D of the Act was introduced by government to try and boost R&D, performed by the private sector in South Africa, in order to contribute towards the country's economic growth through innovation. This study's purpose was to analyse the legislation in South Africa and to compare it with legislation in other states (BRICS) to determine if it is on par with R&D incentives available in these states.

5.2 Summary of research objectives

In order to address the main objective of evaluating whether the current legislation in South Africa is adequate to incentivise more R&D in the country, as compared to other BRICS countries whose economies are also still in the developing stage - namely Brazil and China - research objectives were identified in chapter 1.

The first secondary research objective was to analyse and provide an understanding of the current South African income tax incentives on R&D, section 11D of the Act. This objective was addressed in chapter 2. The second secondary research objectives was to analyse and provide an understanding of the current Brazilian and Chinese income tax incentives on R&D. This objective was addressed in chapter 3. The third secondary research objective was to compare the income tax incentives for R&D available in South Africa, Brazil and China in order to identify the differences and similarities in the countries' approach to R&D. This objective was addressed in chapter 4.

A conclusion has been made, based on the research objectives mentioned above, and recommendations provided to address the problem statement in chapter 1, namely of South Africa not undertaking enough R&D when benchmarked to the international norm of 1% of GERD.

As stated in chapter 1, a literature review was performed in order to obtain a good understanding of the South African, Brazilian and Chinese R&D incentives in order to be able to achieve the research incentives stated in chapter 1. The research objectives mentioned above need to be achieved in order to resolve the problem statement.

The first research objective was to analyse and provide an understanding of the current South African income tax incentives for R&D. Chapter 2 indicated that South Africa has the following incentives for R&D:

- Expenses incurred for R&D can be claimed for income tax purpose at a rate higher than what normal expenditure is deducted at.
- Capital assets acquired solely for the purpose of R&D can be depreciated at a quicker rate than other normal assets.
- Expenses incurred for the registration of inventions, patents, designs and similar property are allowed as a deduction.
- The number of companies applying for the R&D incentive has been declining over the years due to the assessment process taking too long, resulting in a huge backlog of un-assessed R&D projects.

The second research objective was to analyse and provide an understanding of the current Brazil and China income tax incentives for R&D. Chapter 3 indicated that Brazil has the following incentives for R&D:

- Expense incurred for R&D can be claimed for income tax purposes at a rate higher than what normal expenditure is deducted at.
- The total cost of machinery, equipment, instruments and intangibles can be deducted in full in the year of acquisition.
- Funding is available from the government for up to 90% of the total R&D costs.
- Salaries of individuals with a master's or doctoral qualification can be subsidised for up to 60% of the costs.
- Twice the cost of developing a patent can be deducted for income tax purposes.
- Most companies in Brazil do not know about the incentives.
- Some companies are deterred from applying for the incentive due to a lack of qualified persons who know how to implement the incentives.

The following was indicated in chapter 3 with regard to the Chinese tax incentives for R&D:

- Expenses incurred for R&D can be claimed for income tax purpose at a rate higher than what normal expenditure is deducted at.
- Capital assets acquired for R&D can be depreciated at a higher rate than normal assets, but the depreciation should be over a period of at least ten years.

- Certain companies that qualify as HNTEs pay tax at a reduced rate compared to the normal company tax rate.
- Companies being re-accredited as HNTEs have been decreasing over the past few years, due to more stringent auditing rules on the qualifying criteria for HNTEs.

The comparison done in chapter 4 has indicated that South Arica can learn a lot from the R&D tax incentives available in Brazil and China. Based on the comparison, the main objective of evaluating whether the current legislation in South Africa is adequate to incentivise more R&D in the country, as compared to other BRICS countries whose economies are also still in the developing stage, has been achieved, and the problem statement has been addressed appropriately.

5.3 Recommendations

The following recommendations are made to assist the South African government to boost R&D in the private sector, based on the comparisons done between the tax incentives available for R&D in the three states:

- A lower tax rate for companies operating in the technological sphere similar to the HNTE available in China.
- An increase in the deduction rate of 150% for expenditure incurred on R&D.
- A funding programme for certain specific costs within the R&D project, similar to the one Brazil has for subsidising salaries of individuals who possess certain qualification, can be introduced.
- The serious re-assessment of the application process by the government, especially with regard to the committee making a final recommendation to the minister, as well as the final approval by the Minister of the DST. These are two identified bottle necks that should be eliminated in order to ensure an efficient application process that will encourage companies to undertake more R&D projects.

5.4 Suggestions for future research

The following topics have a potential of being researched in the future:

- The definition of R&D in the South African legislation, as compared to other countries.
- Other possible tax incentives (VAT, Custom duties) that can be used in conjunction with the Income Tax incentives to increase R&D spending.
- The viability of an HNTE programme in the current economy of South Africa.

5.5 Conclusion

This study's focus was to compare the R&D tax incentives available in South Africa, Brazil and China in order to identify gaps and to recommend improvements to the South African government on how to encourage the private sector to increase its investment in R&D.

It was identified that South Africa's R&D tax incentives are not on par with those of the other two states. In particular, the South African government needs to urgently re-assess the process that taxpayers have to go through to ultimately be able to claim the R&D incentives available.

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