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POTENTIAL IMPROVEMENTS TO SOUTH AFRICAN RESEARCH AND DEVELOPMENT TAX INCENTIVES: LESSONS FROM BRICS COUNTRIES

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A research report submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, Johannesburg, in partial fulfilment of the requirements for the degree of Master of Commerce (specialising in Taxation)

Johannesburg, 2024

Abstract

The South African government is cognisant of the fact that research and development (R&D) is imperative in stimulating innovation, economic development, and global competitiveness. This has resulted in the government adopting various tax incentives to boost R&D activities. Section 11D of the Income Tax Act 58 of 1962 (Income Tax Act) (Republic of South Africa, 1962) governs the R&D tax incentive, which has evolved since its inception in 2006. The initial plan was for section 11D to come to an end in October 2022. However, in the 2023 Budget Speech, the Minister of Finance declared an extension of ten years for the deadline and simplification of the tax provision to enhance effectiveness.

This study will analyse South Africa's R&D tax policies in comparison to selected other BRICS member countries (Brazil, Russia, India, China) and examine possible improvements. Through the research study, several important findings were made. One is that R&D tax incentives play a crucial role in stimulating innovation investment by relieving the financial burden on companies and therefore allowing them to focus their resources on R&D. Another important lesson is that streamlining application procedures and providing convenient access to R&D tax incentives play a critical role in promoting high levels of participation and effectiveness. Although the Department of Science and Innovation has taken steps to enhance R&D tax incentives, there remains room for improvement to align them with international best practices. Aligning with international best practices will enable South Africa to improve its R&D tax provision by encouraging innovation and attracting domestic and foreign investment.

Key words: Research and development, budget speech, technology, innovation, tax incentives, BRICS, OECD, Minister of Finance, section 11D of the Income Tax Act, investment

Declaration

I declare that this research report is my unaided work. It is submitted in partial fulfilment of the requirements for the degree of Master of Commerce (Specialising in Taxation) at the University of Witwatersrand, Johannesburg. It has not been submitted before for any other degree or examination at any other university.



Keamogetswe Mphephu

August 2024

Dedication

First and foremost, I would like to thank God, for giving me the strength to start and successfully finish this research report despite the challenges that I faced during the research journey. Your Grace has really sustained me.

To my dearest family and friends, I want to express my heartfelt gratitude for your constant love, encouragement, and understanding during this research journey. Your unwavering support has been my guiding force, helping me navigate through every difficulty.

To my beloved Husband thank you for being my pillar of strength and having faith in me, even during moments of self-doubt. Your consistent support has been the key to completing this research report.

This research report is dedicated to my children Rotea and Rotondwa, who have consistently inspired me to finish this project. I trust that this project will demonstrate the importance of persistence, dedication, and the quest for learning. May your dedication and happiness in chasing your dreams mirror the joy you bring into my life daily

This research report is further dedicated to my dear nephews and nieces, as a testament to the power of chasing your dreams. Remember that with determination and perseverance, anything is within your reach.

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List of abbreviations and acronyms

BRICS	Brazil, Russia, India, China, and South Africa
CIT	Corporate income tax
DSI	Department of Science and Innovation
DSIR	Department of Scientific and Industrial Research
GCP	Guideline for Good Practice
GDP	Gross domestic product
GERD	Gross expenditure on research and development
IPAP	Industrial Policy Action Plan
IPR	Intellectual property rights
NSI	National System of Innovation
OECD	Organisation for Economic Cooperation and Development
PPD	Product Process Development Scheme
R&D	Research and development
SARIR	South African Research Infrastructure Roadmap
SARS	South African Revenue Services
SEZ	Special economic zone
SME	Small and medium-sized enterprises
SPII	Support Programme for Industrial Innovation
WIPO	World Intellectual Property Organization

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Chapter 1

Introduction

1.1 Overview of the study

A variety of elements play a role in determining the amount of investment put toward business research in a country (OECD, 2020). These considerations encompass economic and industrial framework; typical scale of businesses; the presence of proficient technical personnel and a suitable science and technology infrastructure; the extent to which the country is open to global economy and links to the global economic system; the expenditure allotted to government spending on primary research; the relationship between publicly and privately funded research; and the level of safeguard for intellectual property and government tax incentives (OECD, 2020).

Research and development (R&D) is a critical component for amplified efficiency, resulting in new or improved goods, systems, or services (National Treasury, 2021). This augmented productivity consequently leads to amplified economic expansion and global competition (National Treasury, 2021). To encourage investment, stimulate economic growth, and foster job opportunities in South Africa, certain companies may qualify for tax relief by means of increased tax deductions (National Treasury, 2021). In compliance with South Africa's tax objectives, tax relief strategies were instituted to boost economic development (Stiglingh et al., 2021:22). Section 11D of the Income Tax Act was instituted to promote research and development activities in South Africa, resulting in increased tax deductions (Stiglingh et al., 2021:22).

The R&D tax incentive was instituted on 1 November 2006 and has been modified over time to better align with its set objectives (National Treasury, 2021). During the period between the effective date and September 2012, corporations had to file retrospective R&D tax incentive requests directly to the South African Revenue Service (SARS) and only report the Department of Science and Innovation (DSI) regarding their R&D expenditure (National Treasury, 2021).

On 1 October 2012, the pre-approval system was established, necessitating firms to apply to the DSI for the Minister of Science and Technology's approval of their R&D activities before seeking any section 11D tax deductions from SARS (OECD, 2020). In accordance with Section 11D of the Income Tax Act, any South African business, regardless of its size or sector, can apply for the research and development incentive (Income Tax Act 1962, s11D). Following the Minister of Higher Education, Science and Innovation authorisation of the R&D project, a firm is eligible to subtract 150% of eligible R&D expenditure from its taxable revenue (Republic of South Africa, 1962).

As initially planned, the prescribed end date of section 11D was October 2022. However, the Minister of Finance declared in his 2023 Budget announcement that the deadline would be extended for a period of ten years and the credit would be simplified and refined to increase efficacy (Godongwana, 2023). The South African government implemented measures to evaluate the existing R&D tax incentive as indicated in the 2021 Budget Review (National Treasury, 2021). This indicates that there are possible improvements that can be incorporated to conform to international regulation. On 15 December 2021, the National Treasury (NT) and the DSI issued a collaborative discussion document entitled “Reviewing the Design, Implementation and Impact of South Africa's Research and Development Tax Incentive” for public comment (National Treasury, 2021).

A diverse array of fiscal assistance tools is being employed by governments globally to incentivise corporate research and development, with tax incentives becoming an

increasingly popular method of encouraging business R&D investment (OECD, 2023). By 2022, most OECD countries (33 out of 38), most European Union member states (22 out of 27), and several other important economies were providing tax benefits for research and development projects approved (OECD, 2023). Tax incentives for research and development come in different shapes and sizes, ranging from accelerated depreciation allowances to tax deductions, to tax credit (OECD, 2023). Tax deductions are a decrease in taxable income, while tax credits are a decrease in tax liabilities (OECD, 2023).

Over the course of the last ten years, there has been a consistent transformation of R&D tax incentives in OECD nations and other analysed economies, causing a perpetual shift in the accessibility, scope, generosity, and implementation of R&D tax relief actions (OECD, 2023).

The South African tax incentives on R&D will be compared to countries that were both in the BRICS alliance before its expansion as well as key partners in the OECD. The basis for selecting BRICS nations is their prominence in leading emerging and developing economies, and their contribution of a major part of world GDP growth (BRICS, 2023). The BRICS economies have established R&D incentives as a testament to their unwavering commitment to advancing innovation and driving economic growth through technological advancements (PwC, 2012) These factors, in combination, serve to enhance the overall development and competitive edge of the economies within the BRICS coalition. All four nations present a distinctive perspective on the composition of their R&D tax incentives framework, from which South Africa can gain insight.

1.2 Research problem

1.2.1 The statement of the problem

In today's global market, R&D is a vital component in promoting innovation, advancing economic development, and enhancing a nation's competitiveness. (National Treasury, 2021) To encourage businesses to invest in R&D, the government of South Africa offers tax incentives (National Treasury, 2021). To maintain its edge in technological development, the country must actively seek out and recognise potential improvements in the current tax system. One key area to focus on is the tax incentives on R&D expenditure. Even though South Africa has tax incentives available, its competitiveness and desirability for conducting business should be assessed in relation to policies of other countries, and a comparison with international policy makers may indicate if improvements need to be made.

It is important to take into account the criteria for eligibility in regard to the R&D tax incentive. Simplifying the qualification process and reducing the administrative burden could attract more companies to participate in R&D.

The primary goal of this research is to examine and contrast the current R&D tax incentives in South Africa and other member countries of the BRICS alliance. Existing tax policies will be examined and areas for improvement in the South African tax system will be identified.

1.2.1.1 The sub-problem

I. The first sub-problem is to assess eligibility for R&D tax incentives in each country, including definitions of R&D activities, covered industry sectors and requirements needed to claim benefits. This study will help provide potential gaps identified in the South African tax system.
II. The second sub-problem is to examine the different methods of calculating tax relief or incentives in different countries, such as the percentage of eligible R&D expenditure or tax credits. A comparison of taxes and procedures will

provide insight into possible improvements to make the taxation in South Africa viewed as more favourable.

III. The third sub-problem is to examine the administrative aspects of the required tax incentives such as documentation required, reporting obligations and compliance mechanisms that are necessary to identify opportunities for the South African tax system.

IV. The final sub-problem is to examine the evaluation and assessment strategies used by different countries to ensure the effectiveness of their R&D tax incentives. This study will help identify best practices and provide a monitoring framework for South Africa.

1.3 Research methodology

The research will be qualitative in nature. The primary sources to be analysed will include the DSI parliamentary reports and other R&D reports, OECD material, tax experts' opinions in published journal articles, South African tax legislation and the related tax legislation of selected comparative countries.

A comprehensive review of existing literature will be conducted to determine whether any improvements need to be made to the South African R&D tax incentives.

1.4 Scope and limitation

The research will compare the South African tax incentives on R&D to those of Brazil, Russia, India, and China. Surveys are not within the scope of this report and therefore will not be analysed.

1.5 Chapter outline

This research report consists of ten chapters.

Chapter 1: Introduction: This chapter introduces the background and significance of the research, the problems and sub-problems identified, the research methodology used, scope and limitations.

Chapter 2: The focus of this chapter is on the present tax provisions that govern the tax incentives for expenditures related to research and development in South Africa. The chapter will further look at the history of the R&D tax incentives and any proposed development in the tax provision. The R&D tax scheme in South Africa is tailored to support both large corporations and small and medium-sized enterprises (SMEs).

Chapter 3: This chapter will focus on the evaluation of quantitative and qualitative outcome of R&D tax incentives in South Africa. The effectiveness of tax incentives will be measured by examining the increase in companies' R&D expenditure. Several studies have revealed a positive correlation between R&D tax incentives and growth in private research spending at a country level (OECD, 2021). Increased R&D spending could indicate the effectiveness of tax incentives in encouraging businesses to pursue innovative endeavours. The evaluation will examine the spill-over consequences of R&D tax incentives. These may include the implementation of novel technologies, job generation, and enhanced competitiveness in various sectors.

Chapter 4: This chapter will compare South Africa's eligibility criteria for R&D tax incentives to those of the other countries. The eligibility criteria for R&D tax incentives are designed to ensure that the activities being rewarded are truly innovative and technological in nature. Comparing South African eligibility criteria to those of other countries will indicate whether South African eligibility criteria are on par with international norms and what improvements are required.

Chapter 5: This chapter will examine South Africa's various tax relief programmes or tax incentives in contrast to the selected countries.

Tax incentives for R&D can take the form of an allowance, exemption, deduction, or credit. Tax allowances, exemptions, and deductions effectively deduct from taxable income before calculating the tax burden, lowering the taxable amount before assessing the tax.

Chapter 6: This chapter will concentrate on the administrative aspects of the required tax incentives. Administration activities includes the following: pre-approval, evaluation of R&D tax relief applications and audit. Nations that employ a pre-approval selection process must prioritize timely feedback to avoid project delays. The proper monitoring and evaluation of projects relies on reliable firm-level data to facilitate thorough qualitative analysis (World Bank, 2019).

Chapter 7: This chapter will look at the evaluation and assessment strategies of different countries as stated in the problem statement. This chapter will help identify best practices and provide a monitoring framework for South Africa.

Chapter 8: This chapter will focus on the refinements introduced by the Department of Science and Innovation in collaboration with National Treasury. The chapter will look closely at the proposed improvements and whether they are aligned to international best practices.

Chapter 9: This chapter will focus on the potential improvements that can be introduced to the South African R&D tax provisions to align them with International best practice. It will focus primarily on shortcomings to the current provisions and how to rectify them.

Chapter 10: Conclusion: This chapter will summarise the findings of the research and propose areas requiring further research.

Chapter 2

South African R&D tax incentive scheme

2.1 History

To determine whether there are any areas for improvement of South African R&D tax incentives, it is essential to have an understanding on the existing tax incentive provisions for R&D. This chapter aims to achieve this by giving an overview of the history of South Africa R&D tax incentive provisions, and by discussing the definitions of R&D and qualifying criteria, administrative aspects of the tax provisions, and the assessment and evaluation of R&D.

The R&D tax incentives in South Africa has undergone numerous modifications, with various crucial policy actions implemented throughout the years (National Treasury, 2021). The R&D tax incentives was initially implemented in 2003 in accordance with the provisions of section 11B of the Income Tax Act (Republic of South Africa, 1962), which was subsequently amended by section 11D in 2006 (National Treasury, 2021). The incentive stated in section 11D grants a 150% deduction for costs associated with eligible scientific or technological research and development conducted by companies in South Africa (Income Tax Act, s11D, ss2). Effective from 2006, companies were authorised to claim accelerated depreciation allowances on assets utilised for scientific or technological R&D (National Treasury, 2021). This would be carried out over a time span of three years, with a proportional distribution of 50%, 30% and 20%, commencing from the year of assessment in which the asset was initially used (Income Tax Act, s12C). This constituted a significant deviation from section 11B, where the deduction for operating expenses was limited to the same 100%, while the capital R&D depreciation allowance was apportioned in a 40:20:20:20 proportion (National Treasury, 2021).

In the 2006 budget speech, the former Minister of Finance, Trevor Manuel, declared revisions to the R&D incentives as follows:

> *'To encourage businesses to increase investment in technology and innovation, the deduction for current research and development expenditure will be increased from 100 per cent to 150 per cent, and a more favourable regime for depreciation of R&D capital expenditure is proposed'* (Manuel, 2006).

The Income Tax Act's Section 11D was initially introduced in the 2006 Revenue Laws Amendment Bill and later adopted into South African law through section 13 of the Revenue Laws Amendment Act, which was passed on 7 February 2007 (Revenue Laws Amendment Bill, 2006). Henceforth, the provision was in operation for all relevant research and development costs incurred on or after 2 November 2006 (Revenue Laws Amendment Bill, 2006).

To supplement government spending on the R&D, the National Treasury implemented an indirect approach to increasing national investment in scientific and technological R&D by introducing section 11D, the aim of which was to encourage private sector investment in scientific or technological R&D initiatives (SARS, 2014).

From 2006 to September 2012, companies were required to submit their retrospective R&D tax incentive claims directly to SARS and only report their R&D spending to the DSI (National Treasury, 2021). Effective 1 October 2012, companies were required to go through a pre-authorisation process from the DSI for their R&D activities. In order to claim a tax exemption from SARS, applicants must first submit their applications to the Minister of Higher Education, Science and Technology (National Treasury, 2021).

In 2013, the definition of R&D was revised to clarify that the incentive was geared towards R&D expenditures that would not have been undertaken without the presence of the incentive. The purpose of this initiative was to incentivise investments in R&D that would yield favourable externalities for the economy, while

simultaneously excluding expenditure on normal business operations (National Treasury, 2021).

The additional 50% claimed under sections 11D (2) and (3) was considered in the DSI's review of applications received from 1 October 2012 to 31 December 2013. During this period, it was at the discretion of the Commissioner to determine whether the expenses were eligible for a 100% allowance under section 11D (SARS, 2014). Section 11D of the Taxation Laws Amendment Act was amended to grant the Minister the authority to grant the full deduction claim of 150%. This amendment became effective from 1 January 2014 (Taxation Laws Amendment Act). The rationale for this extension supports the viewpoint that only activities meeting the R&D requirements outlined in section 11D (1) are eligible for a deduction under sections 11D (2) and (4) (SARS, 2014). All other expenses must be claimed under the general provision outlined in section 11(a) of the Income Tax Act (Republic of South Africa, 1962).

A fundamental amendment was made in 2014 whereby the deduction for capital investment towards buildings, machinery, equipment, utensils, or articles utilised for research and development purposes has been shifted from section 11D to sections 12C and 13 (SARS, 2014). The allowance on the capital assets under those sections was limited to 100%.

The definition of R&D underwent revisions in 2014, which introduced the "innovative" requirement for functional designs and expanded the scope of R&D to include multisource pharmaceutical products and clinical trials (SARS, 2014).

A further amendment was introduced to s11D in 2016, which involved the incorporation of s11D (20) to permit companies to recoup their deductions following difficulties with administrative bottlenecks (National Treasury, 2021).

In the 2023 Budget Speech, the Minister of Finance stated that the R&D tax credit would be extended for the next 10 years and will undergo enhancements to

streamline and enhance its effectiveness (Godongwana, 2023). The refinements to section s11 D of the Income Tax Act are effective from 1 January 2024.

Section 11D of the Income Tax Act addresses the following elements with regards to research and development, which will be discussed below:

I. Qualifying criteria: For the company to be granted the tax incentives, it is a requirement for the company to meet specific criteria as well as conduct R&D activities that qualify for the R&D tax incentive. Therefore, the different criteria and R&D activities that the company needs to meet are discussed in detail below.
II. Tax incentives: Eligible companies can benefit from tax deductions for incurring qualifying R&D expenditure. A detailed discussion follows that outlines the different tax incentives to which companies are entitled. Tax incentives in South Africa are designed to encourage companies to invest in innovation and technology advancement.
III. Administrative aspects of the tax incentives: the R&D tax incentives in South Africa are subject to Government oversight and support. This includes the role played by the Department of Science and Innovation, National Treasury and SARS to ensure that companies adhere to the R&D tax incentives regulations. Therefore, understanding of the administrative aspect of the tax incentives is important and is discussed below.
IV. Evaluation and assessment: Companies receiving R&D tax incentives may undergo compliance reviews or tax audits by the tax authority. It is also important for the DSI to provide feedback to the parliamentary committee on the progress that is made to the tax incentives as s11 D has undergone several amendments in order to refine the tax incentives and align them with international standards.

2.2 Qualifying criteria

To be eligible for R&D tax incentives, companies must meet certain qualifying criteria. This is to guarantee that the incentives are awarded to companies that are genuinely involved in R&D activities and are actively advancing scientific and technological development. The qualifying criteria serve to uphold the integrity of the R&D tax incentives programme by ensuring that companies meet certain standards and fulfil specific requirements before being granted access to the incentive, thereby minimising the potential for any misuse or abuse. Additionally, the qualifying criteria prioritise fairness, transparency, and equality in making R&D accessible to a broad spectrum of companies that fulfil specified criteria.

The Income Tax Act section 11 D defines scientific or technological R&D in the following terms (Republic of South Africa, 1962):

> *'(1) For the purposes of this section "scientific or technological research and development" means systematic investigative or systematic experimental activities aimed at resolving scientific or technological uncertainty and the resolution of which is not readily deducible by a person skilled in the relevant scientific or technological field for the purpose of—*
>
> *(a) discovering new scientific or technological knowledge*
>
> *(b) creating or developing new or significantly improved products, processes or services;*
>
> *(c) . . .*
>
> *(d) creating or developing a multisource pharmaceutical product, as defined in the World Health Organisation Technical Report Series, No. 937, 2006 Annex 7 Multisource (generic) pharmaceutical products: guidelines on registration requirements to establish interchangeability issued by the World Health Organisation, conforming to Regulation 344 of 23 April 2015 and any requirements*

as must be prescribed by regulations made by the Minister after consultation with the Minister of Higher Education, Science and Innovation; or

(e) conducting a clinical trial as defined in Appendix F of the Guidelines for good practice in the conduct of clinical trials with human participants in South Africa issued by the Department of Health (2006), conforming to Regulation 346 of 23 April 2015 and any requirements as must be prescribed by regulations made by the Minister after consultation with the Minister of Higher Education, Science and Innovation:

Provided that for the purposes of this definition, "scientific or technological research and development" does not include activities for the purpose of—

(a) routine testing, analysis, collection of information or quality control in the normal course of business;

(b) . . . . . .

(c) market research, market testing or sales promotion;

(d) social science research, including the arts and humanities;

(e) oil and gas or mineral exploration or prospecting except research and development carried on to develop technology used for that exploration or prospecting;

(f) the creation or development of financial instruments or financial products;

(g) the creation or enhancement of trademarks or goodwill; or

(h) any expenditure contemplated in section 11 (gB) or (gC).'

Various significant concepts and requirements are encompassed in the definition of "scientific and technological R&D", which are discussed separately below. Consistency in the interpretation of these words was ensured by adopting definitions from other legislation. In cases where the legislation was silent, the ordinary meaning of the words was relied upon.

2.2.1 Systematic investigative or systematic experimental activities

The Act does not explicitly define systematic investigative or experimental activities. As a result, these terms should be interpreted according to their ordinary meaning in relation to the particular subject matter being addressed.

According to the Oxford Dictionaries, the words listed below have the following definitions:

- Systematic means *"arranged or conducted according to a system, plan, or organised method; involving or observing a system; acting according to system".*
- Investigative means *"the action or process of investigating a person or thing; examination; inquiry; research; specially scientific".*
- Experimental means *"an action or operation undertaken in order to discover something unknown, to test a hypothesis".*
- Resolving *"means to find an acceptable solution to a problem or difficult*; and
- Uncertainty means *"the state or character of being uncertain in mind; a state of doubt; want of assurance or confidence; hesitation, irresolution".*

The DSI made a decision to align with other OECD countries by explicitly adhering to the guidelines outlined in the 2002 Frascati Manual while revising the definition of scientific research and development. According to the most recent Frascati Manual, the term "person skilled in the art" refers to an individual with a comprehensive understanding of the field (someone familiar with the essential stock of common knowledge) (OECD, 2015). With the intent of making it explicit in the legislation and ensuring that R&D activities that are innovative but not obvious toqualify for the R&D tax incentive, the modified definition incorporates an assessment to ascertain if a qualified individual in the specific field, equipped with the necessary knowledge and competencies, and having access to publicly accessible information, would resolve any scientific or technological uncertainty without undertaking any R&D activities (Department of Science and Innovation, 2024).

The planned activities must be undertaken in a precise, orderly, and methodical manner in the realm of science or technology, utilising experiments or analysis to enhance scientific knowledge or striving for technological progress and uncovering the unknown or validating a theory (SARS, 2014).

In both basic and applied research, there is a level of scientific uncertainty, while in experimental development, there is technological uncertainty. Acknowledging and addressing this uncertainty is a crucial part of any systematic investigation and implies an understanding of the necessity for progress. The ultimate result of the tasks must remain uncertain at the beginning (SARS, 2014).

2.2.2 Discovering new scientific or technological knowledge

The definition of "discovering" is not in the income tax legislation, therefore reliance will be placed on the ordinary meaning of the word per the Oxford English Dictionary.

Discovering means *"to obtain sight or knowledge of or become aware of (a thing or person) previously unknown."*

According to the Oxford English Dictionary, the term "knowledge" refers *"to facts, information, and skills that are obtained through personal experience or education".*

The concept of "newness" in scientific or technological knowledge indicates that the information must not have been made known to the general public anywhere in the world. Scientific knowledge is the outcome of systematically collecting information or conducting experiments using scientific approaches, with the goal of revealing something that was not obvious before or known anywhere else in the world (SARS, 2014). Technological knowledge is the understanding acquired by applying practical sciences to industries or businesses. It is typically expressed in physical form and manifested in products or procedures (SARS, 2014)

According to Chapter 2 of the 2015 Frascati Manual, R&D encompasses three categories of work: basic research, applied research, and experimental development.

Basic research is the process of conducting experimental or theoretical investigations to expand our understanding of the fundamental principles that govern

phenomena and observable facts, without any intended practical application (OECD, 2015).

Applied research involves conducting original studies with the goal of obtaining new knowledge. Its main focus, however, is on achieving a specific practical objective (OECD, 2015)

Experimental development is systematic experimentation which combines research and practical knowledge to generate fresh insights and create new products or enhance existing ones (OECD, 2015)

2.2.3 Creating or developing new or significantly improved products, processes or services

Consistent with the government's position from the beginning, the revised definition now places greater emphasis on scientific or technological uncertainty and the need for systematic investigative and experimental methods, placing a stronger emphasis on the originality of products, processes, or services, rather than the intellectual property results (Department of Science and Innovation, 2024). In order to make applying for and deciding on the incentive easier and more practical, it is suggested that an approach that is not solely based on end-results or IP statute be adopted. This is mainly due to the fact that R&D is characterised by uncertainty and risk, making it unrealistic to assume that taxpayers will have a thorough understanding of the intricacies of their intended research unfold at the time of applying for the incentive (Department of Science and Innovation, 2024)

2.2.4 Creating or developing a multisource pharmaceutical product

A “multisource pharmaceutical product” is defined in the WHO Technical Report as *‘pharmaceutically equivalent or pharmaceutically alternative products that may or may not*

be therapeutically equivalent. Multisource pharmaceutical products that are therapeutically equivalent are interchangeable' (World Health Organisation, 2006).

It is crucial to remember that even when working with a pharmaceutically equivalent product, its effects, efficacy, and safety may differ from those of another, even when they are administered via the same route and under the same circumstances as stated on the other product's label (SARS, 2014). A product classified as pharmaceutically alternative is one that has the same molar amount of the active ingredient but a different form (dosage and/or chemical form) (SARS, 2014). Therefore, the final product might differ from the original in terms of effects, safety, and efficacy. When two medications are given to patients through the same method and in the same manner as specified on the original product's label, they are considered therapeutically equivalent in a generic pharmaceutical product. This phenomenon is observed when the products, when given at equal molar doses, yield identical results in terms of safety and effectiveness (SARS, 2014).

To be eligible for section 11D(1) classification as R&D, a multisource pharmaceutical product must meet the requirements outlined in Regulation R346 as mandated by the Minister of Finance, in addition to the definition found in the WHO Technical Report (SARS, 2014). According to these regulations, the multisource pharmaceutical product has to meet either of the following requirements in Regulation R346 (National Treasury, 2015).

> *'(1) It must constitute –*
>
> *(a) any activity in respect of analysis or characterisation of the properties of a pharmaceutical product with the purpose of determining the excipients and other ingredients to be utilised in the formulation of the multisource pharmaceutical product; compatibility tests between the API, excipients and other ingredients; and dosage form design; or*
>
> *(b) laboratory scale reformulation through experimentation on API, excipients and other ingredients, and pilot plant scale reformulation; or*
>
> *(c) activities, tests, design and reformulation referred to in (a) and (b); or*

(2) It must constitute –

(a) a determination of analytical and stability testing methods if those methods are determined in conjunction with –

(i) the activities, tests and design referred to in (1)(a);

(ii) the reformulation referred to in (1)(b); or

(iii) the activities, tests and design referred to in (1)(a) and the reformulation referred to in (1)(b).'

2.2.5 Conducting a clinical trial

Appendix F of the Guidelines for Good Practice defines a "clinical trial" as follows (Department of Health, 2020):

> *'Any investigation in human participants (including patients and other volunteers) intended to discover or verify the clinical, pharmacological and/or other pharmacodynamic effects of an investigational product(s), and/or to identify any adverse reactions to an investigational product(s), and/or to study absorption, distribution, metabolism, and excretion of an investigational product(s) with the object of ascertaining their safety and/or efficacy.'*

The main objective of these guidelines is to establish a set of clearly defined Guideline for Good Practice (GCP) standards for locally conducted research, in order to assist researchers and other stakeholders. This is to guarantee that clinical studies involving human participants from South Africa adhere to local regulations and uphold strong scientific and ethical principles within the accepted guidelines of good clinical practice (Department of Health, 2020).

The Guidelines for Good Practice are noteworthy in that they exclusively discuss clinical trials involving human subjects. This reference indicates that a trial that does not meet the requirements for human clinical trials under section 11D(1)(e) will not be considered a R&D (SARS, 2014).

2.2.6 Exclusions of activities

Moreover, the following activities are expressly excluded from being R&D activities by s11 D (Income Tax Act, 1962 s11D, ss1e), and will not qualify for the 150% deduction under section 11D (2) even if it meets the requirements under section 11D (1) of R&D. Under section 11(a), the expenses associated with these activities may be eligible for deduction as a general expense (Republic of South Africa, 1962).

2.2.6.1 Routine testing, analysis, collection of information or quality control in the normal course of business

Companies typically engage in routine testing as part of their daily operations, but it does not necessarily lead to any scientific or technological advancement. The approach entails applying established methods in existing products or processes, yielding known results (SARS, 2014).

2.2.6.2 Market research, market testing or sales promotion

R&D eligibility does not extend to project activities that do not directly contribute to resolving scientific or technological uncertainty. A couple of examples may involve the identification and analysis of market segments in which R&D could be advantageous for a company, and a comprehensive review of the financial, marketing, and legal elements of a project.

2.2.6.3 Social science research, including the arts and humanities

Despite the incorporation of scientific and systematic investigative methods, such as quantitative and qualitative approaches, social science research is not eligible for the deduction. Languages, literature, history, philosophy, religion, visual and performing arts (including music), psychology, and economics are all examples of social sciences in this category (SARS, 2014).

2.2.6.4 Oil and gas or mineral exploration or prospecting except research and development carried on to develop technology used for that exploration or prospecting

The Tenth Schedule of the Income Tax Act outlines the regulations for oil and gas exploration and prospecting, providing a unique exemption for companies engaged in these activities (SARS, 2014).

2.2.6.5 The creation or development of financial instruments or financial products

An action or process in the realm of finance ultimately leads to a financial product. A prime illustration of this is an income protection policy, which is a product that results from a financial action or process. The definition of R&D in section 11D(1) explicitly excludes the development of any financial instrument or product (SARS, 2014).

2.2.6.6 The creation or enhancement of trademarks or goodwill

Section 11D does not allow for deduction of any costs involved in trademarks, including their establishment, growth, safeguarding, renewal, or enforcement (SARS, 2014).

2.2.6.7 Any expenditure contemplated in section 11 (gB) or (gC)

Expenses related to patents, trademarks, designs, and copyright are not covered by section 11D, but may be eligible for deduction under sections 11(gB) or (gC) if the criteria are satisfied (SARS, 2014).

2.3 Tax incentives

There exist various tax incentives for R&D such as tax credits, tax deductions, and accelerated depreciation allowances (Pouris, 2003). Tax deductions and credits differ in that the former is deducted from taxable income and the latter is credited against the tax liability (Pouris, 2003). Through tax deductions, a business can deduct a specific percentage of investment expenses from its taxable income in the year the investment is made (SARS, 2014). In this instance, the relief translates into an immediate, upfront tax savings for the business (Pouris, 2003). With the R&D tax credit, a business can lower its tax obligation by a portion of the eligible investment.

A qualifying investment may be written off more quickly with the help of an accelerated depreciation allowance (SARS, 2014). In South Africa, tax incentives related to research and development consist of the tax deduction under section 11D for non-capital expenses, while an entity using capital expenditures for R&D can benefit from an accelerated depreciation allowance on machinery under section 12C and a building allowance under section 13 for R&D-related buildings (SARS, 2014).

2.3.1 Tax Incentives on non-capital expenditure

Section 11 D (2a) of the Income Tax Act states the following with regards to the expenditure incurred on R&D:

> *'For the purposes of determining the taxable income of a taxpayer that is a company in respect of any year of assessment there shall be allowed as a deduction from the income of that taxpayer an amount equal to 150 per cent of so much of any expenditure actually incurred by that taxpayer directly and solely in respect of carrying on of scientific or technological research and development in the Republic if—*
>
> *(i) that expenditure is incurred in the production of income*
> *(ii) that expenditure is incurred in the carrying of any trade*

(iii) that scientific or technological research and development is approved in terms of subsection (9) and

(iv) that expenditure is incurred within six months prior to or on or after the date of receipt of the application by the Department of Science and Innovation for approval of that scientific or technological research and development in terms of subsection (9).'

An incentive granted by the government primarily has the effect of raising the investment's after-tax return to the company, thereby increasing the investment's profitability. The principal benefit of R&D tax incentives over other forms of fiscal incentives is their narrow focus—a company can only benefit from them if it makes the right investments (Pouris, 2003).

In A*BC (Pty) Ltd v. The Commissioner for the South African Revenue Service*, the court of Appeal concluded that

> *'By parity of reasoning, it must be accepted that section 11D creates a class privilege for certain categories of research and development expenditure, by permitting the deduction of 150% thereof, whereas the norm is that only the actual amount of qualifying expenditure can be deducted. I see no reason why in principle such an approach should not be applied in a matter such as the present. Section 11D(5) places a curb on the class privilege available to such categories of research and development expenditure. In my judgment, section 11D(5) must be interpreted as I have done, in the manner set out by Conradie J, in* D & N Promotions*,* supra*.'*

In the aforementioned ruling, the court rejected the appeal in favour of the SARS Commissioner, concluding that not all activities related to R&D qualify for a deduction. The court makes reference to the class privilege of R&D expenses; consequently, only R&D related to a particular class as specified in s11D (1) will be eligible for a deduction. According to the ruling in *ABC (Pty) Ltd v. The Commissioner for the South African Revenue Service*, the Income Tax Act also prohibits specific R&D activities because they do not fall under a designated class privilege. For a taxpayer's revenue expenditure to be eligible for the 150 percent tax deduction

incentive mentioned in section 11 D(l) above, that expenditure must meet the following requirements (Republic of South Africa, 1062):

“1) must be in the production of income

2) must be carrying on a trade;

3) must be approved in terms of subsection 9 of section 11 D of the Income Tax Act

(4) must be incurred within six months prior to or on or after the date of receipt of the application by the Department of Science and Technology for approval of that R&D.”

Important concepts and qualifying criteria requirements will be discussed separately below:

2.3.1.1 Production of income

"In the production of the income" refers to "income" in the sense that it is defined in section 1(1) of the Income Tax Act, which is the gross income less the exempt income. This was confirmed in *CIR v Nemojim Pty Ltd (45 SATC 241)* (Stiglingh et al., 2021:130). Consequently, if a deduction does not relate to producing income as that term is defined, it will not be permitted (Stiglingh et al., 2021:130). In *Port Elizabeth Electric Tramway Co Ltd v CIR* (1936 CPD), the definition of the phrase "in the production of the income" was examined. A transport company was the taxpayer in question (Stiglingh et al., 2021:130). One of its drivers was involved in an accident, which led to injuries and, ultimately, the driver's death. The dependents of the deceased received compensation from the company. The court had to decide what actions resulted in the expenditure and the purpose of the action, and if the expenditure was a necessary concomitant of the revenue-generating business operations (Stiglingh et al., 2021:130). As per *Sub-Nigel Ltd v CIR* (1948 A), expenses do not have to generate income in the year of incurrence in order to qualify for a deduction. The income can only be earned in a subsequent year; however

expenses incurred in order to generate that income are deductible (Stiglingh et al., 2021:130).

Even if the R&D activities are still in the early stages of development or are a complete failure, the taxpayer will still be able to deduct the expenditure as long as they follow section 11D's guidelines (SARS, 2014). If a taxpayer generates income from its R&D activities, they are eligible for a deduction under section 11D(2) when the product of their R&D activities is developed on behalf of another taxpayer (SARS, 2014).

2.3.1.2 Carrying on a trade

The deductibility of expenses and losses incurred in the course of conducting business is contingent upon compliance with the requirements outlined in Section 11D (Stiglingh et al., 2021:124). Section1(1) of the Income Tax Act gives the word "trade" a very broad definition that encompasses:

> *'every profession, trade, business, employment, calling, occupation or venture, including the letting of any property and the use of or the grant of permission to use any patent as defined in the Patents Act, or any design as defined in the Designs Act, or any trademark as defined in the Trade Marks Act, or any copyright as defined in the Copyright Act, or any other property which is of a similar nature.'*

Furthermore, it was noted that the definition is not always comprehensive and that the word "trade" was meant to refer to any profitable activity (Stiglingh et al., 2021:124). Maintaining a trade does not require continuity or the pursuit of profit. To determine whether the taxpayer is actually conducting business, all of the relevant activities should be investigated (*Estate G v COT* (1964 SR)). It is argued that under certain conditions, a taxpayer will be engaged in trade activity even if his goal is not to profit and even if he deliberately sets out to make a loss (Stiglingh et al.,

2021:124). *De Beers Holdings (Pty) Ltd v. CIR* (1985 AD) established that a taxpayer might be forced to sell at a loss or could choose to trade for another commercial advantage for his company. Note on Interpretation No. 33, in par 4.1, issue 5. 6. refers to this as the "active step requirement" and clarifies that it encompasses more than simply keeping an eye on investments that are currently in place but are not intended or expected to generate income (SARS, 2017).

A deduction under section 11A is allowed for R&D expenses that, had they been incurred after the taxpayer began conducting business, would have qualified under section 11D (Stiglingh et al., 2021:124). Once the taxpayer begins to engage in any trade, the pre-trade R&D expenses will be deductible (SARS, 2014).

2.3.1.3 Expenditure actually incurred by the taxpayer

According to the ruling in *Caltex Oil (SA) Ltd v. SIR* (1975 A), "expenditure actually incurred" does not equate to "expenditure actually paid" during the assessment year. It was defined as "all expenditure incurred for a liability during the year, whether or not the liability was discharged during that year.". Therefore, actual payment is not required in order to deduct expenses (Stiglingh et al., 2021:124). In *Edgars Stores Ltd v. CIR* (1988 A), Corbett JA addressed the definition of "incurred" in the majority of the Appellate Division's judgment (at 90).

> *'It is clear that only expenditure (otherwise qualifying for deduction) in respect of which the taxpayer has incurred an unconditional legal obligation during the year of assessment in question may be deducted in terms of s 11(a) from income returned for that year . . . if the obligation is initially incurred as a conditional one during a particular year of assessment and the condition is fulfilled only in the following year of assessment, it is deductible only in the latter year of assessment.'*

Therefore, before any money is "actually incurred," there must be an unwavering legal obligation to pay that amount (Stiglingh et al., 2021:124).

Even if they are funded domestically, activities carried out outside the Republic of South Africa are not eligible for section 11D deductions (SARS, 2014). The deduction-eligible activities have to have been carried out "directly and solely" for an R&D purpose. When a project as a whole has an R&D goal, not every activity is carried out specifically and exclusively for that purpose (SARS, 2014). As a result, general physical and administrative overheads are eliminated because only activities that directly relate to the specified statutory activities are eligible for a deduction (SARS, 2014).

2.3.2 Tax Incentives on capital expenditure

Sections 12C(1)(gA) and (h) of the Income Tax Act on machinery and plant, and section 13(1)(b) or (d) of the Income Tax Act on buildings used for R&D activity, respectively, provide for an accelerated depreciation allowance on eligible assets. Under section 12C(1)(gA) and (h) of the Income Tax Act, a deduction is permitted if the eligible assets are plant and machinery that is (Republic of South Africa, 1962):

- New and unused;
- Under the ownership of the taxpayer or obtained by the taxpayer through acquisition; and
- First utilised by the taxpayer; or
- Developed and utilised for R&D in the applicable fiscal year.

If the eligible assets are buildings that the taxpayer has constructed or acquired for R&D activities, a deduction will be permitted under section 13(1)(b) or (d) of the Income Tax Act (SARS, 2014).

Plant and machinery that has been acquired and put into use by the taxpayer after January 1, 2012, and has not been previously used, can be depreciated for tax purposes if it is being used for research and development; in the year the asset is used, the taxpayer can deduct 50% of its cost, followed by 30% in the second year

and 20% in the third year, this will be allowed in each of the three years of assessment that the asset is in use (Stiglingh et al., 2021:384). Section 13(1)(b) of the Income Tax Act allows for an allowance on buildings used entirely or primarily for R&D activities. Assets that do not meet the requirements for the allowance under section 12C may still be eligible for an allowance under section 11(e) (SARS, 2014). The taxpayer could either buy or construct the buildings for the R&D project. The building's lessor whose tenant or subtenant uses the space exclusively is also eligible for the allowance (SARS, 2014).

2.3.3. Financial assistance

The Support Programme for Industrial Innovation (SPII) supports the growth of technology in South Africa by offering funding for the creation of innovative products and processes. The main objectives involve the enhancement of innovative products and processes, as well as the realisation of projects commencing from basic research to the production of prototypes (Deloitte, 2020). There are two schemes under the SPII:

- The Product Process Development Scheme (SPII PPD Scheme) aimed at aiding small, very small, and micro-enterprises as well as individuals, provides a substantial grant of up to ZAR 2 million. In order to be eligible for this programme, the recipient must possess a turnover figure below ZAR 13 million, assets valued at less than ZAR 5 million, and a workforce size not exceeding 50 individuals (Deloitte, 2020).
- The SPII Matching Scheme provides a maximum of ZAR 5 million in grant funding to enterprises and individuals, including those of large size. Any costs incurred prior to the submission of a fully completed application are not deemed qualifying costs under the SPII (Deloitte, 2020).

Companies may be granted funding 50% to 85% of eligible expenses during the technical development stage. The extent of Broad-Based Black Economic

Empowerment (B-BBEE) ownership dictates the value of the benefits in both schemes (EY, 2023).

2.4 Administrative aspect of tax incentives

2.4.1 Appointment of the R&D adjudication committee

Subsection (9) of the Income Tax Act states the following:

> *'The Minister of Science and Technology or a person appointed by the Minister of Science and Technology must approve any research and development being carried on or funded for the purposes of subsections (2) and (4) having regard to—*
>
> *(a) whether the taxpayer has proved to the committee that the research and development in respect of which the approval is sought complies with the criteria contemplated in the definition of "research and development" in subsection (1);*
> *(b) ….*
> *(c) such other criteria as the Minister of Finance in consultation with the Minister of Science and Technology may prescribe by regulation.'*

In order for the adjudication committee to properly consider the taxpayer's application, it is the taxpayer's responsibility to submit an application. The applicant must provide evidence that its operations align with the definition of "R&D" as per Section 11D(9)(a) (SARS, 2014). Accordingly, the taxpayer has to provide the committee with all the supporting documentation that is required to confirm that the application and the planned R&D comply with section 11D(1). Submission of the application form and all required supporting materials is required (SARS, 2014). Project-by-project applications, not departmental ones, are required for approval of R&D activities (SARS, 2014). A department-based application will not be taken into consideration by the committee unless it clearly identifies the projects for which it is being submitted under each department (SARS, 2014). The approval process is the

sole focus of the committee's mandate as well as determining the extent to which the claimed expense is truly incurred by the taxpayer and whether it is directly related to the R&D activities. (SARS, 2014).

Seven people make up the committee: three DSI representatives appointed by the Minister, one National Treasury representative, and three SARS representatives appointed by the Minister of Finance. The Ministers of Trade and Industry and Finance may appoint substitutes to make sure the committee has the necessary number of representatives from the various state entities (SARS, 2014). Furthermore, in order to serve on the committee as needed, any individual designated as an alternate member may also carry out the duties of a main or alternate member of the relevant department (SARS, 2014).

2.4.2 Function of the committee

In terms of s11D (12) of the Income Tax Act, the committee is required to perform the following functions (Republic of South Africa, 1962):

- Elect its own chairman and determine the protocols for its meeting (Income Tax Act, s11D (12)(b)(i)).
- Review R&D application forms of taxpayers to determine if they meet the criteria outlined in section 11D(1) for defining R&D (Income Tax Act, s11D (12)(b)(ii)).
- Provide the required recommendations to the Minister for approval in accordance with section 11D(9) (Income Tax Act, s11D (12)(b)(ii)).
- Scrutinise or designate individuals to scrutinise approved R&D applications (Income Tax Act, s11D (12)(b)(iii)).
- Review all approved applications to assess the effectiveness of the incentive and provide recommendations to the relevant Ministers regarding potential changes to this section in the future (Income Tax Act, s11D (12)(b)(iv)).

- Seek guidance from individuals with suitable knowledge and skills to provide advice to the committee on specific issues as needed (Income Tax Act, s11D (12)(b)(v)).
- Seek further information or documents from an applicant to support their submitted application (Income Tax Act, s11D (12)(b)(vi)).

Members of the committee are required to protect its integrity by guaranteeing the confidentiality of all applications (SARS, 2014). Any confidential information included in the application may not be used by a committee member for their own benefit or the benefit of another individual. Members of the committee are required to stay away from circumstances that could lead to a conflict of interest (SARS 2014).

2.4.3 Pre-approval process

Subsection 16 of section 11D describes the pre-approval process for R&D (Republic of South Africa, 1962)

> *'The Minister of Science and Technology or the person appointed by the Minister of Science and Technology contemplated in subsection (9) must—*
>
> *(a) provide written reasons for any decision to grant or deny any application for approval of any research and development under subsection (9), or for any withdrawal of approval contemplated in subsection (10);*
>
> *(b) inform the Commissioner of the approval of any research and development under subsection (9), setting out such particulars as are required by the Commissioner to determine the amount of the deduction in terms of subsection (2) or (4); and*
>
> *(c) inform the Commissioner of any withdrawal of approval in terms of subsection (10) and of the date on which that withdrawal takes effect.'*

The taxpayer must be informed of the Minister's decision regarding any application that is received. If an application is accepted, rejected, or its approval is revoked,

written justifications must be given. The Act's objection and appeal procedures do not apply to any decision made by the Minister under section 11D of the Income Tax Act. A taxpayer is required to submit an annual progress report to the committee detailing the amount of R&D that is conducted, as well as the extent to which such R&D requires specialised skills (SARS, 2014). If the applicant is dissatisfied with the Minister's decision made pursuant to section 11D(1) of the Income Tax Act, they must apply to the High Court to have the matter reviewed in accordance with the provisions of the Promotion of Administrative Justice Act 3 of 2000 (PAJA) (SARS, 2014).

The necessary data must be submitted in the format, manner, and location that the Minister may from time to time specify, including electronically (SARS, 2014). Every year that follows in which the deduction is claimable, the first submission must be made within a year of the assessment year in which approval was given. The DST can assess the incentive's effectiveness, among other things, by reporting once a year (SARS, 2014).

2.5 Evaluation and assessment

Every year, the Minister is expected to report to parliament on the direct benefits to employment, economic growth, other overarching government goals, and the total amount spent on the activities listed in section 11D(1) of the Income Tax Act (SARS, 2014). Section 11D(17) of the Income Tax Act may require the Commissioner to furnish information that the Minister needs to fulfil its reporting obligations.

A taxpayer is required by section 29 of the Tax Administration Act to keep all documents pertinent to their tax return for five years following the date of submission to SARS. The following records must be kept by taxpayers claiming expenditure under section 11D:

- The initial claim for deduction must be submitted within one year of the approval year, with subsequent claims made each year thereafter. The DSI provides a method for assessing the effectiveness of the incentive, tracking the progress of activities, and validating the actual expenses involved in conducting the R&D project. Additionally, it guarantees the maintenance of accurate records for R&D expenses claimed under section 11D(2) or (4), such as timesheets and apportionment calculations used to determine claimable expenditures (SARS, 2014);
- Information regarding assets, including acquisition and disposal dates, descriptions, costs, and deductions claimed under sections 12C(1)(gA), 11(e), or 13(1)(b), (d), or (dA), or previously under section 11D(1) (SARS, 2014);
- Information about grants, including those provided by the government, that have been received or accrued for funding purposes (SARS, 2014);
- Spending on R&D (SARS, 2014);
- details of related recoupments (SARS, 2014);
- records which monitor the technical progress of the R&D activities (SARS, 2014); and
- Returns filed with DSI in accordance with section 11D(13) (SARS, 2014).

2.6 Conclusion

South Africa provides a range of tax incentives to promote R&D activities within the country. The objectives of these incentives are to promote economic expansion, technological innovation, and growth (National Treasury, 2021). Companies that carry out eligible R&D activities are eligible for tax benefits, which are the primary incentives and are administered by SARS. For eligible expenses paid during the tax year, businesses are entitled to a tax deduction. Companies can claim a tax

allowance for qualified R&D assets, such as machinery and equipment used in R&D activities, in addition to the tax deduction (Income Tax Act, s12C). The overall aim of these tax benefits is to increase South Africa's competitiveness, innovation, and R&D spending. They offer financial assistance to businesses that are prepared to engage in R&D and advance the economic growth of the country (National Treasury, 2021).

Chapter 3

Evaluation of the impact of the R&D tax incentives in South Africa

3.1 Statistical report on the application process and approval of tax incentives

R&D tax incentives are primarily designed to encourage innovation and improve competitiveness, ultimately leading to the creation of jobs, widespread technology adoption, and economic growth (World Bank, 2019). The reason behind the tax incentives is to encourage companies to increase their investment in R&D, offsetting any negative impact of market imperfections that could deter private involvement in this field (World Bank, 2019).

At the time of completing this research paper, the DSI had not published the latest report to parliament for the 2022/23 financial year to demonstrate the impact of tax incentives on R&D activities. The latest published report was for the 2020/21 financial year, which was published on 18 January 2024 (Department of Science and Innovation, 2024). This demonstrates the administrative challenges faced by the department. Therefore, this chapter will look at the 2020/21 DSI parliamentary report, 2023/24 Budget and Annual Performance Plan as well as other reports from the world bank and OECD to evaluate the impact of R&D tax incentives in South Africa.

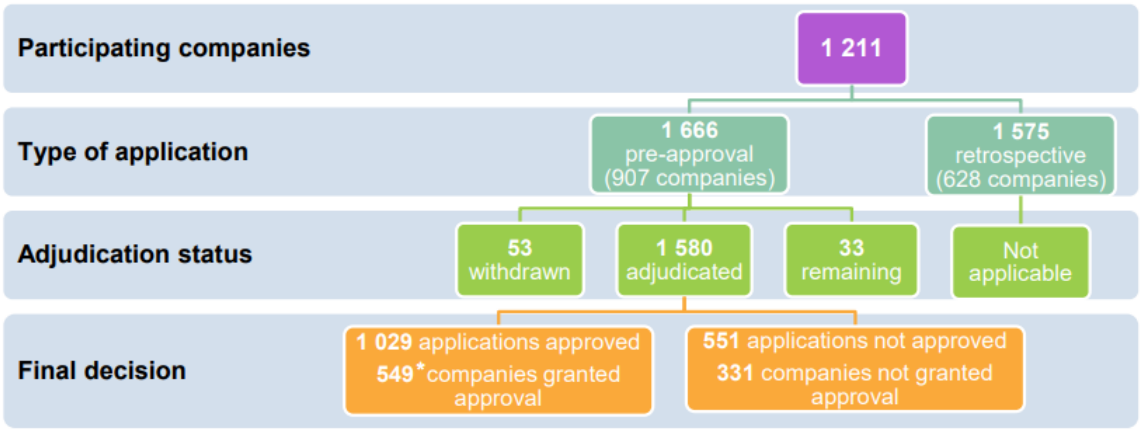
The Department of Science and Innovation's 2023/24 Budget and Annual Performance Plan outlines their main priority for the upcoming years, which is to bolster research infrastructure and innovation capabilities through sustained funding for the South African Research Infrastructure Roadmap (SARIR) which is set aside a budget of R3.9 billion for this objective (Department of Science and Innovation, 2023). The primary objective of enhancing research capacity involves the

establishment of the National Space Infrastructure Hub and the expansion of the Square Kilometre Array (SKA) radio telescope, with respective funding amounts of R1.2 billion and R1.3 billion in the medium-term budget (Parliamentary Monitoring Group, 2023). The Department remains dedicated to promoting human capital development, ensuring the National System of Innovation (NSI) remains globally competitive and supporting South Africa's skills requirements with a budget of R8.7 billion (Parliamentary Monitoring Group, 2023).

During the reporting period, the timely communication of decisions to applicants and the number of applications processed and completed are crucial factors in evaluating the efficiency of the R&D tax incentive programme (Department of Science and Innovation, 2024).

Figure 1 illustrates a summary of the progress of the incentives from its inception to 2020/21 fiscal year. The DSI has seen a total of 1,211 companies participate from 2006 to 2021. As shown in figure 2, in the 2020/21 fiscal year, 123 applications were received by the DSI from 104 companies. These applications were for 306 R&D projects, with a combined estimated R&D expenditure of R2.1 billion. Since October 2012, the DSI received a total of 1,666 pre-approval applications. Out of these, 53 candidates withdrew their applications, leaving the DSI with 1,613 valid ones. Per the DSI 2020/21 report R&D tax incentive is accessible for different categories of companies. Small and medium-sized firms (SMEs) with a revenue of R40 million or less were identified as 424 (42.6%) of the 995 businesses that have received support since 2006. Large enterprises (with a turnover of R41 million to R100 million) made up 13% (129) of the total, while very large enterprises with a turnover of R100 million and above made up 346 (34,8%) and the rest of the companies did not disclose their turnover (Department of Science and Innovation, 2024).

Figure 1: Summary of the R&D application received and approved from 2006 to 2021

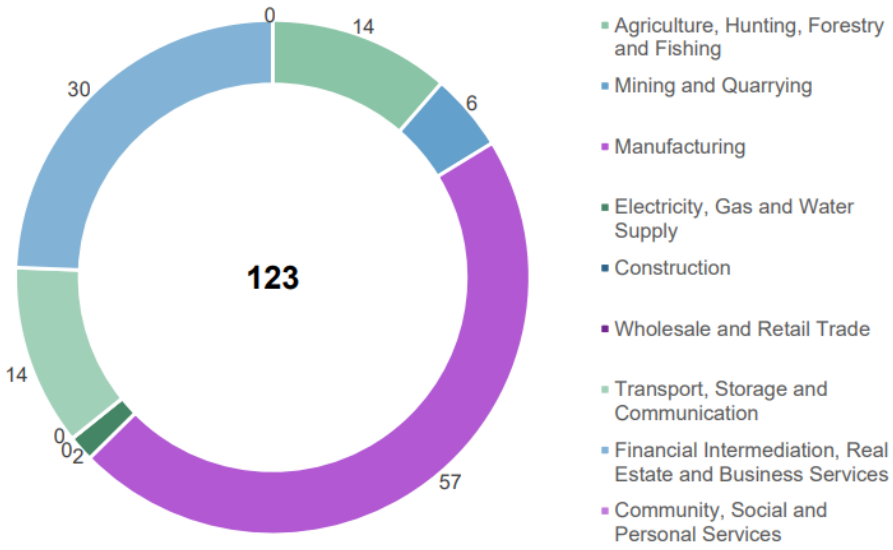


Source: Department of Science and Innovation (2024)

There has been an increase in the number of applications received surpassing those received in the past two years. Increased awareness of the R&D tax incentive program and a better understanding of the requirements for approval could be the reason for the increase in applications that the DSI has received.

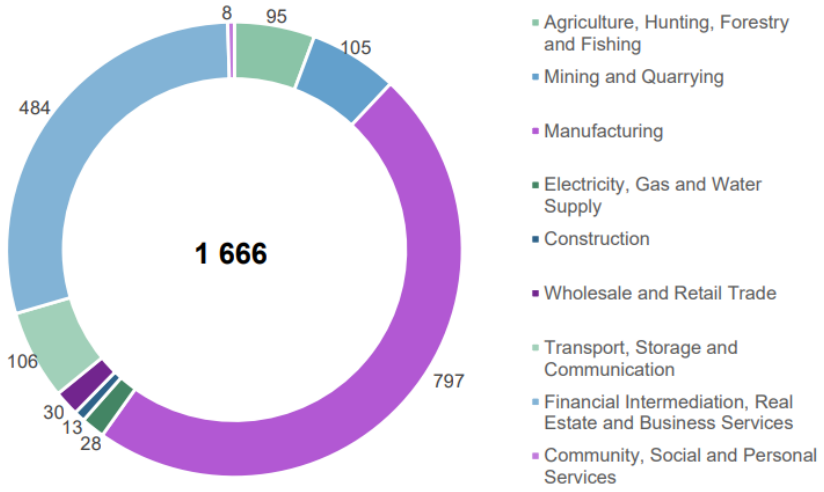
Figure 2 presents the 2020–2021 distribution of applications by Standard Industrial Classification (SIC) sectors; Figure 3 presents the same data for the October 2012–February 2021 period.

Figure 2: Distribution of applications received amongst the different sectors for 2021



Source: Department of science and Innovation (2024)

Figure 3: Distribution of applications received amongst the different sectors from 2012 to 2021



Source: Department of Science and Innovation (2024)

Of the applications received by the program, the bulk (77%) come from the manufacturing sector (797), financial intermediation (484) and real estate (484) firms. Financial intermediation, real estate, and business services are dominated by industries associated to information and communication technology (ICT), whereas the pharmaceutical industry leads the manufacturing sector. (Department of Science and Innovation, 2024). As seen in figure 2 and 3 above, the manufacturing industry is the sector with highest applications. It appears that the incentive encourages R&D in sectors key to generating employment.

3.2 Estimates of tax revenue foregone due to the incentive

Government assistance for corporate sector R&D in science and technology is provided by tax revenue foregone (Department of Science and Innovation, 2024). Tax expenditures refer to the estimated amount of lost revenue resulting from preferential tax treatment (National Treasury, 2024). According to the National Treasury Budget Review (2024), approximately R6.3 billion in tax revenue was foregone between 2005 and 2021/22 due to the R&D tax incentive. These numbers are updated each year as companies file their claims (National Treasury, 2024). Based on the figures in Table 1 below, the revenue foregone as a result of SARS granting the tax deduction in terms of s11D, the revenue foregone fluctuates year on year and it does not truly reflect the impact the changes in the tax legislation has in companies investing in R&D activities.

Table 1: R&D Expenditure estimates (revenue foregone) from 2005 to 2022.

Reporting period	Tax revenue foregone (R'000)
2005/06	183 000.00
2006/07	449 000.00
2007/08	358 000.00

2008/09	594 000.00
2009/10	966 000.00
2010/11	1 216 000.00
2011/12	361 000.00
2012/13	197 000.00
2013/14	219 000.00
2014/15	207 000.00
2015/16	277 000.00
2016/17	234 000.00
2017/18	266 000.00
2018/19	279 000.00
2019/20	119 000.00
2020/21	268 000.00
2021/22	161 000.00
Total	6 354 000.00

Source: National Treasury (2024)

The B-Index estimates of each country are monitored by the OECD, which is among several methods used to gauge the extent of R&D tax incentives and innovation activities (OECD, 2024). Utilising the B-Index enables the assessment of the attractiveness of R&D tax incentives in different countries by determining the profitability benchmarks for corporations involved in R&D. In the realm of R&D, a positive B-Index is seen as desirable for companies, while a negative B-Index is seen as undesirable.

The B-Index is calculated as follows:

$$B\text{-Index} = \text{ATC}/\ 1 - \text{Ƭ} = 1 - \text{A}/1 - \text{Ƭ}$$

In the B-Index, the numerator shows the after-tax expenditure for investing in a single unit of R&D, considering all existing tax provision. In this expression, ‘A’ is the aggregate net present value of tax deductions and credits for incremental research and development investment and ‘Ƭ’ is the corporate tax rate. The denominator converts the after-tax numerator into pre-tax terms, allowing the comparison across countries with different tax rates (OECD, 2024).

According to the OECD database accessed on 22 February 2024, South Africa has maintained a steady B-Index of 0.16 over the years (OECD, 2024). This might be an indication that the changes in the tax provision have little effect on the B-index of the country, this is also evidenced by companies continuously investing in R&D activities regardless of the changes in the R&D tax provisions.

South Africa responded to the COVID-19 crisis by amending R&D legislation, specifically in regard to the administration of tax incentives for quicker and easier access to R&D funding and modifications to the eligibility requirements to ensure that a diverse group of businesses could benefit from the R&D tax incentive (Department of Science and Innovation, 2024).

3.3 Impact of R&D tax incentives on South African GDP

South Africa's economic progress has been noticeably slower in recent years compared to other developing nations, leading to concerns about its competitiveness and hampering its ability to generate tax revenues (Department of Science and Innovation, 2024). The 2021/22 R&D statistical analysis reveals that the gross expenditure on research and development (GERD) has exhibited minimal growth in correlation to the gross domestic product (GDP) over the years (Department of Science and Innovation, 2024). In light of the launch of the 2019 STI White Paper, the Department of Science and Innovation aspires to elevate GERD/GDP to 1.5% by the year 2030 and an aspirational GERD/GDP of 2% a decade later (Department of Science and Innovation, 2024). For the 2021/2022 fiscal year The majority of R&D funding, 52.5% (R20.049 billion), came from the government. Business funding accounted for 29.0% (R11.081 billion) and foreign funding made up 14.5% (R5.539 billion). In the past decade, foreign funding has reached its highest point at R5.539 billion. There has been a noticeable increase in foreign investment over the years,

with a significant portion being directed towards higher education and the business sector.

3.4 Conclusion

The impact of South Africa's R&D tax incentives on encouraging innovation and fuelling economic progress can be observed through the consistent GERD/GDP measurement (Department of Science and Innovation, 2024). These incentives have motivated companies to invest more in their research and development efforts by allowing them to recoup a portion of their expenses. As a result, there has been a greater emphasis on innovation as businesses work to stay ahead in their respective industries. In addition, the growth of R&D departments has contributed to the creation of jobs and the development of skills, as companies strive to take full advantage of the offered incentives.

Chapter 4

Assessing the eligibility criteria for R&D tax incentives in each country

This chapter will compare South Africa's qualifying criteria with those of other nations that were key OECD partners and members of the BRICS alliance prior to its expansion. The BRICS countries were chosen based on their stature as the leaders of developing and emerging economies, which accounts for a significant portion of global GDP growth (BRICS, 2023). The establishment of R&D incentives by the BRICS economies is evidence of their resolute dedication to promoting innovation and propelling economic growth via technological advancements (PwC, 2012). When combined, these elements help to improve the economies of the BRICS alliance's overall growth and competitiveness. South Africa can learn from the unique perspectives that each of the four countries offers regarding the structure of their R&D tax incentive programme. The tax laws of those individual nations and OECD reports will be the primary sources of information.

4.1 Brazilian eligibility criteria

The General Rule (Law of Goodness), automotive sector benefit (Program Rota 2030), informatic sector benefit (The New IT Law), and automotive regime incentive are the four main tax incentives for R&D in Brazil (KPMG, 2021). In certain circumstances, it is a common practice to combine the different laws, for example, the automotive industries combine the Law of Goodness and the Rota 2030 programme together (KPMG, 2021). In line with global technological trends, the Brazilian system is progressively gaining appeal as a means to boost investments in

R&D and drive the development of cutting-edge technologies and innovations (PwC, 2012).

R&D initiatives across various sectors in Brazil have been strongly supported by the Brazilian government. Tax incentives for R&D was implemented by the government in 2005, taking effect in 2006 (EY, 2023). R&D tax incentives were introduced in South Africa and Brazil at roughly the same time.

The Brazilian Law No. 11.196/2005 defines technological innovation as

> *'I – the conception of a new product or manufacturing process, as well as the addition of new functionalities or characteristics to the product or process that implies incremental improvements and effective gains in quality or productivity, resulting in greater competitiveness in the market*
>
> *II – technological research and development of technological innovation, the activities of:*
>
> *a) directed basic research: work carried out with the aim of acquiring knowledge regarding the understanding of new phenomena, with a view to developing innovative products, processes or systems;*
>
> *b) applied research: work carried out with the aim of acquiring new knowledge, with a view to developing or improving products, processes and systems;*
>
> *c) experimental development: systematic work designed based on pre-existing knowledge, aiming to prove or demonstrate the technical or functional viability of new products, processes, systems and services or, even, an evident improvement of those already produced or established;*
>
> *d) basic industrial technology: those such as the measurement and calibration of machines and equipment, the design and manufacture of specific measuring instruments, certification of conformity, including the corresponding tests, the standardization or technical documentation generated and the patenting of the product or process developed; It is*

e) technical support services: those that are essential for the implementation and maintenance of facilities or equipment intended exclusively for the execution of research, development or technological innovation projects, as well as the training of human resources dedicated to them.'

In order for a project to signify a new development for the taxpayer; it need not be innovative in the sector (PwC, 2012).

Chapter 8 of the Brazilian instruction IN-RFN 1187/11 regulates the use of benefits in technological innovation. Some of the primary requirements are listed below:

- The company must have a taxable income within the period
- All project-related expenses must be monitored and managed through designated accounts (Article 18, IN-RFN 1187/11).
- In order to be eligible, items and services must be acquired within the borders of Brazil, with a few limited exceptions (Article 8, IN-RFN 1187/11).
- Entities that utilise the Information Technology Law benefit can also use the incentives (Article 18, IN-RFN 1187/11).
- Expenditures eligible for tax benefits in Brazil encompass expenses related to employee salaries, outsourced R&D services, procurement of machinery and equipment, as well as raw materials for testing and certain local costs directly linked to R&D projects (Article 5, IN-RFN 1187/11).
- In order to utilise the benefit, the company must have federal clearance that is valid for two semesters of the calendar year (Article 19, IN-RFN 1187/11)

The eligibility criteria for South Africa and Brazil are similar. However, South Africa requires R&D projects to focus on resolving technological scientific uncertainties while Brazil emphasises the need for certification of R&D activities and a focus on technological innovation and product development.

4.2 Russian eligibility criteria

Russia has witnessed remarkable advancements in enhancing its innovation capabilities in recent times. The adoption of R&D tax incentives has opened up new avenues for promoting innovation and bringing about a modernised economy. This is considered a key factor in future economic growth (PwC, 2012).

The Russian government passed tax incentives in 2009 to boost domestic business expansion through heightened research and development initiatives (Deloitte, 2015). The government appears to be gradually reducing its direct involvement in R&D initiatives, favouring indirect encouragement through the expansion of R&D incentives and simplification of administrative procedures (EY, 2022).

The growing trend of investing in research and development activities is leading to an increasing number of companies showing interest in becoming residents of special economic technology zones (EY, 2022). The government has put forth a proposal to implement new R&D tax incentives and extend the current ones.

On June 7, 2011, then Russian President Dmitry Medvedev signed Federal Law No. 132-FZ (Russian Federation, 2010), which introduced significant changes to tax laws regarding research and development, including a new approach to determining R&D costs for tax advantages. The regulations of Law No. 132-FZ officially came into force on January 1, 2012 (PwC, 2012).

Clause 1 of Article 262 of the Tax Code of the Russian Federation Part Two states the following:

> *'expenses for research and (or) development shall be taken to mean expenses associated with the creation of new or improvement of already manufactured products (goods, work and services), and in particular expenses associated with inventive activity and expenses for the formation of the Russian Technological Development Fund and other sectoral and intersectoral funds for the financing of research and development work which have been registered in accordance with the*

procedure envisaged by the Federal Law, Concerning Science and State Scientific and Technical Policy.'

R&D investments should be directed towards creating new products, enhancing production methods, or launching new services in accordance with company objectives (EY, 2022). Qualifying expenses include costs for labour, payments to external R&D providers, and the depreciation of equipment used for research and development, along with other related expenditures (with restrictions) (EY, 2022).

Eligible activities are restricted to conducting research and development within five key clusters, as well as profiting from the findings. These activities involve the transfer of intellectual property rights, offering consulting services for research and development, and manufacturing pertaining to the results of R&D activities (Deloitte, 2015). In order to qualify for tax incentives related to R&D, it is crucial for the company to maintain its registration as a Russian legal entity and engage in one of the designated types of innovative: energy efficient technologies; nuclear technologies; space technologies and telecommunications; biomedical technologies; information technologies (Deloitte, 2015).

The eligibility criteria for Russia focus on development of new products, services and goods for specific innovative activities in order to qualify for the R&D incentives, whereas the eligibility criteria for South Africa require R&D projects to focus on resolving technological scientific uncertainties and are not specific to any industry.

4.3 Indian eligibility criteria

Throughout the years, India has become a favoured destination for numerous multinational enterprises seeking to invest in the country (PwC, 2012). The Indian government upholds a progressive perspective when it comes to driving R&D activities and consistently reinforces such activities, with a pronounced focus on

advancing the manufacturing industry and nurturing innovative solutions within the realms of science and technology (KPMG, 2021). India's favourable demographics have fuelled its technological capabilities, resulting in a sustained inflow of investments (PwC, 2012). Furthermore, the Indian authorities have been providing preferential taxation schemes for investments made towards in-country research and development undertakings over the course of the last two decades (EY, 2023). In order to be eligible for R&D tax benefits in India, an organization must be involved in the realm of biotechnology or the production of any tangible commodity, with the exception of those explicitly excluded (KPMG, 2021). It is imperative that the Department of Science and Industrial Research (DSIR) under the Ministry of Science and Technology grants approval for R&D activities (EY, 2023).

In South Africa, the R&D tax incentive is available to all tax-paying entities actively involved in R&D activities that meet the prescribed definition under the Income Tax Act. In India the incentives are targeted at specific sectors such as biotechnology and manufacturing, and companies must obtain approval from the Department of Science and Industrial Research for their in-house R&D activities. Furthermore, India has a broader definition of R&D. Just like South Africa, however, it includes activities related to the creation of new knowledge, products, or processes or the improvement of existing ones.

4.4 Chinese eligibility criteria

China has long been offering a substantial portion of R&D incentives, and the system is continuously improving with frequent updates to legislation and regulations (PwC, 2012). Taxpayers who qualify for Technologically Advanced Service Corporation (TASC) and High and Innovative Technology Enterprise (HNTE) status are eligible for government incentives in China. TASC and HNTE refer to companies that

possess state-of-the-art technologies and a highly skilled workforce, resulting in efficient production and service provision (EY, 2023).

In order to be granted HNTE status, companies must have full ownership of the intellectual property related to the core technology used in their products within the Chinese market, or the worldwide exclusive license for the aforementioned IP has to be awarded to the Chinese subsidiary for a minimum period of five years (US-China Business Council, 2013).

China's HNTE programme provides a reduced tax rate of 15% for innovative companies that meet specific criteria, instead of the standard corporate tax rate of 25%. In order to be eligible for HNTE status, a corporation must (US-China Business Council, 2013):

- Have been operating in China for over a year;
- Consistently conduct R&D activities and proficiently convert intellectual property into viable products or services;
- Must over the past three years have procured proprietary ownership of the essential technology behind its main product or service, utilizing methods such as independent research and development, transfer or purchase, charitable donations, and mergers or acquisitions, or by way of a distinctive license encompassing a term of greater than five years.
- Pursue business endeavours in a qualified field of progressive and emerging technology, encompassing areas such as aviation, aerospace, biological and medical sciences, electronic data, sustainable energy, novel materials, and high-tech services, or progressive technologies integrating resources, environmental protection, and advanced innovations to modernize traditional industries);
- Encourage the participation of 10 percent of staff in R&D initiatives, with a substantial 30 percent holding at least an associate degree.

HNTE is not the only significant innovation tax policy in China. TASC status is also a crucial aspect that aims to promote the growth of information technology outsourcing (ITO) and business process outsourcing (BPO), or knowledge process outsourcing (KPO) services to overseas entities (Zhou, 2023). Initially introduced within the Suzhou Industrial Park in 2016, the TASC incentive was subsequently implemented on a nationwide scale in 2017, resulting in a reduction of the Corporate Income Tax (CIT) rate for eligible TASC entities from the prescribed 25 percent to 15 percent, similar to HNTE treatment (Zhou, 2023)

The eligibility criteria for TASC are as follows (Zhou, 2023):

- Company must specialise in providing expert and cutting-edge outsourcing solutions, such as information technology outsourcing (ITO), business process outsourcing (BPO), and knowledge process outsourcing (KPO), with a focus on implementing advanced technologies or possessing robust capabilities in research and development
- It is imperative that the personnel possess a minimum level of education, with at least 50% of the workforce being graduates with an associate degree or higher.
- The mandated minimum revenue threshold from qualified technologically advanced services, equivalent to half of the annual total revenue, must be met.
- The minimum revenue requirement for qualified offshore outsourcing services must be set at 35% of the annual total revenue.
- In order to receive zero-rated value-added tax on revenue from eligible offshore outsourcing services, it is imperative that the company offers technologically sophisticated outsourcing services in the fields of ITO, BPO, or KPO to foreign companies.

South Africa has a broad definition of R&D which includes activities aimed at the development or improvement of products, processes or services. China, on the other hand, has a more specific definition that focuses on technological innovation and scientific research activities. South Africa's R&D tax incentives are available to all industries, whereas in China the focus is more on high-tech industries.

4.5 Conclusion

Based on the assessment of the eligibility criteria for R&D tax incentives of the BRICS nations, it can be concluded that the South African eligibility criteria are simpler and very generous, as the tax incentives are available to a wide range of industries, compared to other countries where their main focus is on technological or manufacturing industries.

Chapter 5

Examining the different methods of calculating tax relief or incentives in South Africa in comparison with the selected countries

The focus of this chapter is on South Africa's tax relief programmes and incentives, which will be compared to those of other BRICS countries. Businesses that engage in research and development may be eligible for allowances, exemptions, deductions, or credits through these initiatives. The taxable income is reduced by tax allowances, exemptions, and deductions before the tax burden is calculated, effectively reducing the tax burden during tax assessment. A tax credit is a deduction from the taxpayer's tax liability, applied after the liability has been determined.

5.1 Brazilian Tax Incentives

Brazil has the following R&D tax incentives which will be discussed below:

- Tax credits
- Reduced tax rates/preferable tax rates
- Accelerated depreciation on R&D assets
- Tax deduction (including super deduction)
- Financial support
- Tax exemption

The main tax incentives for R&D in Brazil can be categorized into four groups: the General Rule (Goodness Law), benefits for the automotive sector (Rota 2030 Program), benefits for the informatics sector (New IT Law), and the Automotive Regime. These legislations can be integrated in some circumstances, as seen by

the automotive industry's application of the Law of Goodness in conjunction with the Rota 2030 initiatives (KPMG, 2021).

5.1.1 Tax incentives available under the law of Goodness (*Lei do Bem*)

Chapter 3 Article 17 of the Law 11.196/2005 (Law of Goodness) states that the following are the incentives for technological innovation (KPMG, 2021):

I. *'deduction, for the purpose of calculating net income, of an amount corresponding to the sum of the expenditures made in the calculation period with technological research and development of technological innovation classifiable as operating expenses by the Corporate Income Tax (IRPJ) legislation or as payment in the manner provided for in paragraph 2 of this article;*
II. *reduction of 50% (fifty percent) of the Tax on Industrialized Products (IPI) levied on equipment, machinery, apparatus and instruments, as well as the spare accessories and tools that accompany these goods, intended for research and technological development;*
III. *full depreciation, in the same year of acquisition, of new machinery, equipment, apparatus and instruments, intended for use in technological research and development of technological innovation activities, for the purpose of calculating IRPJ and CSLL; (Text given by Law No. 11,774 of 2008)*
IV. *accelerated amortization, by means of deduction as an operating cost or expense, in the calculation period in which they are made, of the expenditures related to the acquisition of intangible assets, linked exclusively to the activities of technological research and development of technological innovation, classifiable in the beneficiary's deferred assets, for the purpose of calculating the IRPJ;*
V. *reduction to 0 (zero) of the withholding income tax rate on remittances made abroad for the registration and maintenance of trademarks, patents and cultivars.'*

5.1.1.1. Tax Deduction

Taxpayers who have incurred qualified expenses can access a generous super deduction ranging from 160% to 200%, while the "standard" super deduction is equal to 160% of eligible R&D expenditures (KPMG, 2021). Should a company decide to raise its contracted researcher count in a designated fiscal period, surpassing the average from the previous period, the super deduction will reflect this increase (KPMG, 2021).

A significant constraint of this incentive is that it is a temporal restriction, exclusively relevant to the fiscal year in which R&D expenses are invested (PwC 2012). In the event that a qualifying company is unsuccessful in generating tangible profits in the designated calendar year, or if its profits are inadequate to cover all research and development expenditures, the non-deductible portion of those costs will remain unused (PwC, 2012).

5.1.1.2. Reduced tax rates

Eligible companies engaged in research and development projects can benefit from a decrease in federal excise tax (*Imposto sobre Produtos Industrializados*, or IPI) as per the relevant regulations (EY, 2023). As per the IPI reduction, Brazilian businesses utilising imported instruments, equipment, machinery, apparatus and tools or conducting research and development within Brazil can benefit from a 50% decrease in IPI levied and taxpayers must claim the incentive at the time of acquisition in order to receive the IPI reduction (KPMG, 2021).

5.1.1.3. Accelerated depreciation.

Under R&D regulations, businesses have the option to expedite the write-off of costs associated with acquiring assets that are solely used for R&D purposes during the assessment period of their acquisition (Deloitte, 2020).

5.1.1.4. Financial support

The Brazilian government has launched a programme to support national companies in their emerging research and development projects by providing reduced interest rates. The preapproval process must be completed in order to access up to 90% funding for the total project expenses (EY, 2023).

5.1.2 Tax incentives available under the IT Law Tax exemption

To be eligible according to the provisions of Law No. 8,248/1991, enterprises must be actively engaged in the creation of information and communication technology merchandise, allocating resources towards R&D, and adhering to the fundamental manufacturing process (KPMG, 2021).

5.1.2.1. Tax exemption

In terms of article 8 of the IT Law No. 8,248/1991, the following tax incentives are available (EY, 2023):

> *'Purchases of machines, equipment, apparatus and instruments produced in the country, as well as their parts and spare parts, accessories, raw materials and intermediate products carried out by the National Development Council are exempt from the Tax on Industrialized Products (IPI).'*

The purchase of machinery, equipment, devices, and instruments, along with their spare parts, accessories, and raw materials within the country, is not subject to IPI tax. In addition, this option is open to eligible companies, with the requirement that the assets are solely utilised towards research and development initiatives (KPMG, 2021).

5.1.2.2 Tax credit

Article 4 of IT Law No. 8,248/1991 states the following regarding tax credit (Brazilian Government, 2021):

'Legal entities that carry out development or production activities of information and communication technology goods that invest in research, development and innovation activities in this sector will be entitled, until December 31, 2029, to financial credit resulting from the minimum expenditure effectively applied in these activities.'

Companies that produce information and communication technology products, engage in research and development, and follow standard manufacturing procedures are eligible under the provisions of Law No. 8,248/1991. Companies in Brazil have the opportunity to receive a 13.65% tax credit on incentivised products, as long as they invest a minimum of 4% of their sales in R&D initiatives (Deloitte, 2020).

5.1.3 Automotive sector benefit (Program Rota 2030)

Companies in the automotive industry can take advantage of tax incentives under Law 13.755/18 (KPMG, 2021). In accordance with Law 13.755/18, Article 7, the establishment of the Rota 2030 Program focuses on promoting technological advancements, competitiveness, innovation, vehicle safety, environmental conservation, energy efficiency, and overall quality of cars, trucks, buses, and chassis with engines and auto parts (Law 13.755/18, Article 7).

5.1.3.1. Reduced tax rates/preferable tax rates

In accordance with Article 2 of Law 13.755/18, the tax incentives included in Programme Rota 2030 are specified in the legislation below (KPMG, 2021):

'2 The federal Executive Branch may reduce the Tax on Industrialized Products (IPI) rates for vehicles referred to in the caput of art. 1st [sic] *of this Law in: (Production of effect) (See Provisional Measure No. 1,205, of 2023) Validity*

I - up to two percentage points for vehicles that meet specific energy efficiency requirements.

II - It is up to one percentage point for vehicles that meet specific structural performance requirements associated with steering assistive technologies.

1. Subject to the provisions of 2, the rate reduction referred to in item II of the caput may only be granted to the vehicle whose applicable IPI rate has already been reduced, in accordance with item I of the caput of this article, in, on minimum, one percentage point.

2 The sum of the rate reductions referred to in items I and II of the caput of this article is limited to two percentage points.

3 In the reduction of rates referred to in this article, imported goods will be granted treatment no less favourable than that granted to similar goods of national origin.

4 Hybrid vehicles equipped with an engine that uses, alternatively or simultaneously, gasoline and alcohol (flexible fuel engine) must have a reduction of at least three percentage points in the IPI rate in relation to conventional vehicles, of similar class and category, equipped with this same type of engine.'

The law permits a maximum 2% decrease in IPI for qualifying vehicles, and also exempts import taxes for products not produced domestically. To be eligible for this deduction, the business must meet the energy efficiency, structural proficiency, and driving-aid technology stipulations set forth in the legislation (EY, 2023).

Article 11 of Law 13.755/18 provides further tax incentives by reducing the income tax and social contribution rate for companies that engage in the Rota2023 program:

'The legal entity qualified in the Rota 2030 Program - Mobility and Logistics may deduct from the Corporate Income Tax (IRPJ) and the Social Contribution on Net Profit (CSLL) due the amount corresponding to the application of the rate and additional of IRPJ and the CSLL rate on up to 30% (thirty percent) of expenditures made in the country, in the calculation period itself, as long as they are classifiable as operational expenses under IRPJ legislation and applied to:

I - research, covering the activities of directed basic research, applied research, experimental development and structuring projects;

II - It is development, covering development activities, supplier training, basic manufacturing, basic industrial technology and technical support services.

1 The deduction referred to in the caput of this article cannot exceed, in each calculation period, the amount of IRPJ and CSLL due based on:

I - in real profit and in quarterly adjusted results;

II - in the real profit and in the adjusted result determined in the annual adjustment; or

III - on the estimated calculation basis, calculated based on gross revenue and additions or based on the result determined in the balance sheet or reduction balance sheet.

2 The amount deducted from IRPJ and CSLL calculated from the estimated calculation base referred to in item III of 1 of this article:'

Furthermore, as per Brazilian regulations, businesses have the opportunity to receive a tax deduction ranging from 10.2% to 12.5% on income tax and social contributions when they allocate a specific investment towards R&D (KPMG, 2021).

5.2 Russian tax incentives

Russia has the following R&D tax incentives which will be discussed below (EY, 2023):

- Tax credits
- Reduced tax rates/preferable tax rates
- Reduced social security contributions
- Accelerated depreciation on R&D assets
- Tax deduction (including super deduction)
- Tax exemption

- Tax holiday

5.2.1 Investment tax credit

Clause 1 of article 66 of the Tax Code of the Russian Federation Part One defines investment tax credit (KPMG, 2021)

> *'as an alteration of the time limit for the payment of tax whereby, subject to the existence of the grounds referred to in Article 67 of this Code, an organization is granted the possibility of reducing its tax payments over a specified period and within specified limits and subsequently paying the amount of credit and interest charges on an instalment basis. Investment tax credit may be granted in respect of tax on the profit of an organization and in respect of regional and local taxes. Investment tax credit may be granted for a period of from one to five years*.'

The investment tax credit serves as a tax deferral plan where taxpayers can lower their tax payments for a set time period, followed by repayment of the tax credits and any interest accrued (EY, 2023). Taxpayers have the opportunity to receive an investment tax credit for a period of one to five years, capped at 50% of their total payment.

In terms of clause 1 of article 67 of the Tax Code of the Russian Federation Part One, investment tax credit is granted to an organisation when the following grounds apply:

1) *'the organization is conducting research and development work or technical modernization of its own production activity, including with the aim of creating jobs for disabled persons or protecting the environment against pollution by industrial waste and (or) raising the energy efficiency of the production of goods, performance of work and rendering of services;*

2) *the organization is carrying out technical adaptation or innovation work, including the creation of new or improvement of existing technologies and the creation of new types of raw materials and other materials;*
3) *the organization is executing an order which is highly important for the social and economic development of the region or provides essential services to the public;*
4) *the organization is fulfilling the State defence order;*
5) *the organization invests in the creation of facilities which have the highest energy efficiency rating, including apartment blocks, and (or) are connected with renewable sources of energy, and (or) are classified as facilities for the generation of thermal energy or electrical energy which have an efficiency coefficient exceeding 57 per cent, and (or) other highly energy-efficient facilities and technologies in accordance with the list approved by the Government of the Russian Federation.'*

The tax authorities have a 30-day period to approve or reject taxpayers' requests for an investment tax credit on their current R&D expenses (KPMG, 2021).

5.2.2 Reduced tax rates

Eligible taxpayers undertaking certain R&D activities can take advantage of a reduced corporate income tax rate of 15.5%, rather than the usual 20% (Deloitte, 2020). In addition, assets used for R&D purposes may be eligible for a reduced assets tax rate, lower than the standard (some regions provide assets tax exemption) (EY, 2023).

Legislation has been implemented by the Russian government to facilitate the swift expansion of the IT field and to centralize resources for emerging projects (Federal Law dated 31 July 2020 N 265-FZ 'On amendments to the part two of the Tax Code of the Russian Federation'). On 1 January 2021, a number of alterations and tax incentives were introduced for the IT and Technology (KPMG 2021).

From 1 January 2021, software and electronics developers benefited from a reduced 3% profits tax rate and a 7.6% rate for social insurance contributions. Furthermore,

another amendment made was the extent of the VAT exemption for the sale of software (including through a licensing agreement) which was restricted and exclusively applied to Russian software named in a designated register (Deloitte, 2020).

Article 284 of the of the Tax Code of the Russian Federation Part two states the following regarding the reduced tax rate:

> *'For Russian organizations which operate in the field of information technology, develop and sell their own computer programmes and databases on physical media or in the form of an electronic file via communications channels, irrespective of the type of agreement, and (or) render services (perform work) involving the development, adaptation and modification of computer programmes and databases (computer software and information products) and install, test and support computer programmes and databases, the tax rate for tax payable to the federal budget shall be established at 3 per cent and the tax rate for tax payable to the budget of a constituent entity of the Russian Federation shall be established at 0 percent.'*

The criteria for the application of the benefits for IT companies are as follows as per clause 1.15 of the Article 284 of the Tax of the Russian Federation part two:

- The company needs to obtain state accreditation for its IT operation (Part 2 of Russian Federation, Article 284, 1.15).
- The primary source of the company's income is generated through IT operations, including the production and distribution of computer programmes and databases, and the sale of license rights, which collectively account for 90% of their total revenue. IT operations do not encompass the commercialization of software through advertising (Part 2 of Russian Federation, Article 284, 1.15).
- A minimum of seven staff members is required (Part 2 of Russian Federation, Article 284, 1.15).

5.2.3 Accelerated depreciation

Taxpayers may apply a special coefficient, not exceeding three, on the standard depreciation rate for depreciable fixed assets in terms of Clause 2.2 of Article 259.3 of the Tax of the Russian Federation Part Two; however, the fixed assets must be used exclusively for conducting scientific and technical work (Tax Code of the Russian Federation Part Two, 2000). Generally, the expenses can be rolled over for a period of 10 years (Tax Code of the Russian Federation Part Two, 2000).

5.2.4 Tax deduction (including super deduction)

A 150% super deduction is available to companies undertaking eligible R&D activities, which can significantly decrease their taxable income (Deloitte, 2015). Even if R&D efforts do not result in a new product or service, a super deduction can still be claimed. Generally, any unutilised expenses can only be carried forward to cover up to half of the tax profits in the current tax period (KPMG, 2021).

5.2.5 Tax holiday

Entrepreneurs who engage in R&D and utilise simplified or patent tax systems can qualify for a 0% tax rate for two years through this incentive (Deloitte, 2020).

5.2.6 Special Economic Technology Innovative Zones (SEZ)

Tekhnopolis (Moscow), Dubna (Moscow Region), Istok (Moscow Region), St. Petersburg, Tomsk, Saratov, and Innopolis make up the six SEZ TIPs.

Article 37 of the Federal Law No. 116-FZ Concerning Special Economic Zones in the Russian Federation of 22 July 2005 (Russian Federation, 2005) states that the customs treatment of free customs zone is as follows:

> *'1. A free customs zone shall mean the customs treatment under which foreign commodities are placed and used within the limits of the territory of a special economic zone without paying customs duties and value-added tax, as well as without imposing in respect of the said commodities the bans and restrictions of*

economic nature established in compliance with the laws of the Russian Federation on the state regulation of foreign trade activities, while Russian commodities shall be placed and used under the terms and conditions applied to exportation in compliance with the customs treatment of exports making payment of excise tax and without payment of export customs duties.

2. Commodities shall be placed by residents of a special economic zone under the customs treatment of a free customs zone for the purpose of exercising by them industrial-and-production or technological-and-innovative activities.'

According to the current legislation, SEZ residents are eligible for the following benefits and preferences (EY, 2023):

- An exemption from property taxes for 5 to 10 years (Federal Law No. 116-FZ, article 37)
- Exemption from VAT (Federal Law No. 116-FZ, article 37)
- Exemption from land taxes for a period of 5 to 10 years (Federal Law No. 116-FZ, article 37)
- The federal government imposes a 2% corporate income tax, while regional governments impose a tax ranging from 0% to 13.5% (12.5% from 2017 to 2022).

5.2.7 Free customs area

To be eligible for residency in an SEZ (Trade and Industry Policy Strategies (TIPS), the following requirements must be met:

- SEZ requires official registration within its designated boundaries (Federal Law No. 116-FZ, article 37)
- A distinct agreement with the governing bodies of the SEZ must be concluded regarding the execution of eligible technological and innovation projects (Federal Law No. 116-FZ, article 37).

SEZ TIPS encompass technological and innovation activities, which involve producing software products, data collection systems, and related services (EY, 2023).

5.2.8 Skolkovo Innovation Center

Article 1 of the Federal Law No. 244-FZ Concerning Innovative Centre Skolkovo of 28 September 2010 (Russian Federation, 2010) define activities that are under the Federation law:

> *'The project involving the creation and maintenance of the innovation centre Skolkovo (hereinafter referred to as the project) shall be implemented for the purpose of expansion of scientific research works, developments and commercialization of their results along the guidelines cited in Part 8 of Article 10 of this Federal Law*.'

The Russian Government has established the Skolkovo Innovation Centre to promote innovation and technical research in the country. Companies in Russia that are officially recognized as residents of the Skolkovo Innovation Centre may receive a range of tax benefits, financial grants, and exemptions from taxes to support their research and development initiatives (PwC, 2012). According to Skolkovo Law No. 244-FZ, the R&D activities must encompass strategic computer technologies and software with the intent of commercial use. Upon registration, project participants are eligible for a status that lasts up to 10 years (EY, 2022).

Article 8 of the Skolkovo Law No. 244-FZ states the following with regards to the scientific research activities:

> *'scientific research activities shall be exercised along the following guidelines:*
>
> *1) energy efficiency and energy saving, in particular the development of innovative energy technologies;*
>
> *2) nuclear power technologies;*

3) space technologies, primarily as regards telecommunication and navigation systems (in particular, the creation of the appropriate land infrastructure);

4) medical technologies, as regards the development of equipment and medicines;

5) strategic computer technologies and software.'

To qualify as a member of the Skolkovo Innovation Centre:

- a Russian company must demonstrate its engagement in research and development activities aligned with its foundation documents (PwC, 2012).
- The company's executive management is permanently situated within the boundaries of the Skolkovo Innovation Centre (PwC, 2012).
- The company does not include shareholders hailing from countries deemed as offshore (PwC, 2012).

Under this scheme, individuals working for these companies who decide to move to the vicinity (located three to four miles southwest of Moscow) can receive grant funds totalling US$150,000 to millions of dollars (EY, 2022).

The Skolkovo Innovation Centre offer R&D incentives such as

- Exempting profits from taxation;
- Taxpayer's VAT obligations being waived;
- Exempting property from taxes; and
- The Russian Pension Fund, Social Insurance Fund, Federal Mandatory Medical Insurance Fund, and Regional Mandatory Medical Insurance Fund all have decreased rates for mandatory insurance contributions (14%, 0%, 0%, and 0%, respectively) (PwC, 2012).

From the date of obtaining project participant status, an entity can enjoy these benefits for a duration of 10 years (EY, 2022).

5.3 Indian tax incentives

India has the following R&D tax incentives which will be discussed below (EY, 2023):

- Cash grants
- Loans
- Reduced tax rates/preferable tax rates
- Reduced social security contributions
- Tax deduction (including super deduction)
- Tax exemptions
- Patent-related incentives
- Financial support
- Tax holidays
- VAT reimbursement

5.3.1 Cash grants

The DSIR offers financial assistance through its Technology Development Program (TDP) to support industrial R&D projects (EY, 2022). In September 1996, the Indian government established the Technology Development Board (TDB) in accordance with the Technology Development Board Act, 1995, with the aims outlined in chapter 14 of the Project Funding Guidelines, which have the following responsibilities:

- Offering financial support, based on regulations, to industrial companies in the form of equity capital or other assistance, and other agencies trying to use indigenous technology for commercial purposes, or modifying foreign technology for broader use within the country;
- By providing financial assistance, the central government demonstrates its recognition and support for R&D institutions that are working towards

developing native technology or adapting imported technology for commercial use;

- Fulfilling any other tasks delegated by the central government.

Concessional loan assistance is the most frequently used method of funding by the Board, and it includes several requirements such as paying royalties on sales made during the loan period (Deloitte, 2020).

In addition, the Board provides funding through equity participation, which may necessitate promoters to pledge shares to the Board in return for equity subscription. In certain circumstances, the Board offers financial support through grants, which is an alternative form of funding. In the event of receiving financial assistance, the recipient may be obligated to repay the Board an equal amount or allocate a proportion of their profits (EY, 2023).

5.3.2 Tax deduction (including super deduction)

The Indian government introduced a 200% tax deduction on research and development expenditures in 2011, but this was lowered to 150% in 2016 and further reduced to 100% in 2020 (Deloitte, 2020).

Only approved entities that receive a donation or contribution are eligible for deductions.

The deductions available are as follows (Republic of India, 1961):

a) Taxpayers are entitled to a full 100% deduction on payments made to a national laboratory, university, or institute of technology, as long as the funds are earmarked for scientific research that has been approved as a programme by prescribed authorities. The Principal Scientific Adviser to the Indian government is the prescribed authority for specified individuals, while the head of a national laboratory, university, or institute of technology serves as the prescribed authority (Income Tax Act, 1961, s35, ss(i)).

b) Should the contributions be allocated towards scientific research, they may be eligible for a full tax deduction if directed towards accredited establishments such as research societies, tertiary institutions, or higher education centres. The central government formally approves and announces in the Official Gazette research associations, universities, or colleges as approved institutions (Income Tax Act, 1961, s35, ss(ii)).

c) Contributions to scientific research companies can receive a deduction of up to 100% (Income Tax Act, 1961, s35, ss(iia))

However, the following conditions must be satisfied to claim the deduction:

- The registration of the company must take place in India (Income Tax Act, 1961, s35, ss(iia)(A)).
- The primary goal of the company should revolve around scientific R&D (Income Tax Act, 1961, s35, ss(iia)(B)).
- Approval from the Chief Commissioner of Income Tax is required for the company (Income Tax Act, 1961, s35, ss(iia)(C)).

d) Contributions made to approved institutions can result in a deduction of up to 100% (e.g., research associations, universities, colleges that undertake research in social science or statistical research) primarily designated for conducting research in the fields of social sciences or statistics.

5.3.3 Patent-related incentives

Section 115BBE of the Income tax Act (Republic of India, 1961) states the following with regards to the patent registered in India:

> *'where the total income of an eligible assessee includes any income by way of royalty in respect of a patent developed and registered in India, the income tax payable shall be the aggregate of—*

(a) the amount of income tax calculated on the income by way of royalty in respect of the patent at the rate of ten per cent; and

(b) the amount of income tax with which the assessee would have been chargeable had his total income been reduced by the income referred to in clause (a).'

To further encourage the retention and commercialisation of current patents and the creation of new innovative patented products, Indian residents who hold a patent that was developed and registered in India may be subject to a 10% tax (plus surcharge) on their gross royalty income without any deductions for expenses (Deloitte, 2020).

To be eligible for the benefit, the following conditions must be met (Republic of India, 1961):

- It is imperative to develop and legally register the patent in India.
    - "Developed" is defined to mean "*at least 75% of the expenditure incurred by the assessee for invention in respect of which patent is registered*" (IncomeTax Act, 1961, s115BBE, ss4a).
- To be classified as an eligible assessee, a person must be a resident of India, the original creator of the invention, and have their name officially listed as the patent owner on the patent registry according to the Patents Act of 1970 (Income Tax Act, 1961, s115BBE, ss4b).
- Patents created and officially registered in India are deemed eligible income and include the following in the form of royalties:
    - Income earned from the sale or transfer of any patent rights (Income Tax Act, 1961, s115BBE, ss4h (i)).
    - Income gained through providing knowledge on the functioning of the patent (Income Tax Act, 1961, s115BBE, ss4h (ii)).
    - Income generated from the utilisation of a patent (Income Tax Act, 1961, s115BBE, ss4h (iii)).

- Provision of services related to the aforementioned activities (Income Tax Act, 1961, s115BBE, ss4h (iv)).

- Eligible income excludes the following (Republic of India, 1961):
  - The consideration is subject to taxation as capital gains (Income Tax Act, 1961, s115BBE, ss4h).
  - Sale of goods created through patented manufacturing method (Income Tax Act, 1961, s115BBE, ss4h).
  - A patented invention designed for commercial use (Income Tax Act, 1961, s115BBE, ss4h).

5.3.5 Tax holiday

S10AA of the Income Tax Act (Republic of India, 1961) states the following with regards to the tax holiday:

> *'(1) subject to the provisions of this section, in computing the total income of an assessee, being an entrepreneur as referred to in clause (j) of section 2 of the Special Economic Zones Act, 2005, from his Unit, who begins to manufacture or produce articles or things or provide any services during the previous year relevant to any assessment year commencing on or after the 1st day of April, 2006, but before the first day of April, 2021, the following deduction shall be allowed—*
>
> *(i) hundred per cent of profits and gains derived from the export, of such articles or things or from services for a period of five consecutive assessment years beginning with the assessment year relevant to the previous year in which the Unit begins to manufacture or produce such articles or things or provide services, as the case may be, and fifty per cent of such profits and gains for further five assessment years and thereafter;*
>
> *(ii) for the next five consecutive assessment years, so much of the amount not exceeding fifty per cent of the profit as is debited to the profit and loss account of the previous year in respect of which the deduction is to be allowed and credited to a reserve account (to be called the "Special Economic Zone Re-investment Reserve*

Account") to be created and utilized for the purposes of the business of the assessee in the manner laid down in sub-section (2).'

The tax holiday can be obtained by companies through the establishment of their units in Special Economic Zones (SEZs). SEZ businesses that have exported goods and services between 1 April 2006 and 31 March 2021 are entitled to a 15-year tax exemption on export profits, phased in over time (EY, 2023). That said, the SEZ units will not be granted the super deduction for R&D expenditures. Furthermore, businesses that choose to take advantage of the reduced corporate tax rates cannot also receive the tax holiday (KPMG, 2021).

In terms of subsection 2 of s10AA of the Income Tax Act (Republic of India, 1961),

'The deduction under clause (ii) of sub-section (1) shall be allowed only if the following conditions are fulfilled, namely: —

(a) the amount credited to the Special Economic Zone Re-investment Reserve Account is to be utilised—

(i) for the purposes of acquiring machinery or plant which is first put to use before the expiry of a period of three years following the previous year in which the reserve was created; and

(ii) until the acquisition of the machinery or plant as aforesaid, for the purposes of the business of the undertaking other than for distribution by way of dividends or profits or for remittance outside India as profits or for the creation of any asset outside India;

(b) the particulars, as may be specified by the Central Board of Direct Taxes in this behalf, under clause (b) of sub-section (1B) of section 10A have been furnished by the assessee in respect of machinery or plant along with the return of income for the assessment year relevant to the previous year in which such plant or machinery was first put to use.'

Units located in SEZs can access incentives, as long as they are not the result of dividing or reconstructing pre-existing businesses. Additionally, the establishment of a SEZ unit cannot occur by transferring previously owned plant and machinery. The

deduction or benefit can only be obtained by companies if they file their income tax return within the specified timeframe for the relevant fiscal year (Deloitte, 2020).

The following are the potential intentions for setting up a unit in an SEZ:

- Manufacturing
- Offering services (which may involve R&D services)
- Conducting trading and warehousing activities

5.3.6 Customs duty exemption and concessions

Institutions involved in pharmaceutical and biotechnology research have the potential to benefit from a reduced customs duty rate when importing particular instruments, equipment, or components, as long as they meet specified qualifying criteria. As per the Budget 2022 statements, this exception was valid until 31 March 2023. Currently, the applicable customs duty is imposed according to the tariff rate.

5.3.7 Goods and Services Tax (GST) concessional rate (research institution)

Research institutions are eligible for a reduced GST rate on the purchase of specified goods, provided certain conditions are met (KPMG, 2021).

Additionally, the exportation of services can be applied to an Indian service provider offering R&D services focused on the pharmaceutical industry to a foreign recipient and therefore qualifies for benefits offered to exports (Deloitte, 2020).

The reduced rate of GST can be applied, provided that the specified conditions outlined in the relevant notifications are met:

- In order for a university to be considered, it must have official recognition from the government through the DSIR, and its head must issue a certificate to the supplier certifying the necessity of the goods for research and their exclusive use for their intended purpose (EY, 2023).
- The goods must not be sold or transferred within a period of five years after installation (EY, 2023).

5.4 Chinese tax incentives

China has the following R&D tax incentives which will be discussed below:

- Reduced tax rates/preferable tax rates
- Tax deduction (including super deduction)
- Tax exemptions
- Tax holidays

5.4.1 Reduced tax rates/preferable tax rate

Article 28 of the Law of the People's Republic of China on Enterprise Income Tax states the following with regards to the reduced tax rate: (People's Republic of China, 2007).

> *'with respect to a qualified small enterprise earning low profits, the tax levied on its income shall be reduced at a rate of 20 percent.*
>
> *With respect to a high and new technology enterprise that needs key support by the State, the tax levied on its income shall be reduced at a rate of 15 per cent.'*

During the validation period of the HNTE certification, eligible companies can benefit from a 15% decrease in the corporate income tax (CIT) rate (EY, 2023). As of 1 January 2018, an HNTE has the ability to roll over tax losses for a maximum of 10 years (for example tax losses from 2013 that are not utilised by an HNTE until 2018 can be carried forward for five more years) (Caishui, 2018).

Article 30 of Law of the People's Republic of China on Enterprise Income Tax states the following with regards to the reduced tax rate: (People's Republic of China, 2007).

'Weighted deduction may be made for the following expenses when the amount of taxable income of an enterprise is calculated:

(1) expenses on research and development incurred for developing new technologies, products or techniques; and

(2) wages paid for job placement of the disabled and of other persons so encouraged by the State.'

A business possessing TASC certifications can potentially receive a 15% decreased tax rate.

5.4.2 Tax deduction (including super deduction)

In March 2023, the Chinese tax authorities made an announcement that the pre-tax super deduction for R&D expenses would be extended indefinitely, reaffirming its standing as a permanent preferential policy for all businesses in China (Huld, 2023).

According to Announcement No.119 of Caishui, in order for R&D expenses to qualify for the super deduction, they must fulfil the following criteria: *'systematic activities with clear objectives that companies continue to carry out to acquire new scientific and technological knowledge, creatively apply new scientific and technological knowledge, or substantially improve technologies, products (or services), and processes.'*

Notice 64, released on June 25, 2018 by the Minister of Finance, the State Administration of Taxation, and the Ministry of Science and Technology, allows resident enterprises to receive super deductions for outsourced offshore R&D expenses effective from 1 January 2018 (Baker McKenzie, 2018).

5.4.3 Tax exemptions

In terms of Article 27 of the Law of the People's Republic of China on Enterprise Income Tax (People's Republic of China, 2007),

'tax on the following income of an enterprise may be exempted or reduced:

(3) income earned from qualified projects of environmental protection or energy and water conservation;

(4) income from qualified technology transfer; and

(5) income as specified in the third paragraph of Article 3 of this Law.'

The China Income Tax Law allows for qualified technology transfer income to be exempted or reduced, providing an incentive for current investments.

5.4.4 Tax Holidays

Any HNTE that meets the eligibility criteria and is based in any of China's five Special Economic Zones or Shanghai Pudong New Area, as of 1 January 2008, may be eligible for a tax exemption lasting two years, followed by a partial deduction lasting three years starting from the initial year of generating production or operating profit (EY, 2023)

The tables below will summarise all R&D tax incentives in the BRICS countries, while also drawing a comparison between South Africa's incentives and those of other BRICS nations. The table includes a brief comparison after each set of similar R&D tax incentives from the different countries.

Table 2: South African Accelerated depreciation on R&D assets compared to other BRICS countries.

Tax Incentive	Brazil	Russia	India	China	South Africa
Accelerated depreciation on R&D assets	100% on eligible R&D assets in the same year of acquisition	Special coefficient, of up to a maximum of three, to	A 100% on capital expenditures other than land in the	No incentive	Accelerated depreciation at a rate of: 50%, 30%, 20% over a

		calculate the basic depreciation rate for amortisable fixed assets	same year it was incurred		period of 3 years
Comparison comment: All the BRICS countries provide the accelerated depreciation tax incentives on fixed assets purchased for R&D except for China. Brazil and Russia provide 100% upfront deduction on capital expenditure (EY, 2023), whereas South Africa splits the incentives over a period of three years (Income Tax Act) and Russia provides a basic depreciation with a special coefficient not higher than three i.e., the original cost of the asset is multiplied by three in order to calculate the total depreciation (Tax Code of the Russian Federation Part Two, 2000). The purpose of this tax incentive is for companies to recover the cost of the asset more quickly than the traditional straight-line method. This comparison shows that South Africa take longer to recover the cost of the capital expenditure compared to the other nations. South Africa only changed the way in which capital expenditure on R&D are amortised in 2012. The primary objective of the change was to stimulate businesses to boost their investment in technology and innovation (SARS, 2014).					

Table 3: South African tax deduction (including super deduction) compared to the tax deduction of other BRICS countries.

Tax Incentive	Brazil	Russia	India	China	South Africa
Tax deduction (including super deduction)	160% to 200% deduction on approved R&D activities	150% deduction of R&D expenses	100% deduction on approved in-house R&D expenditure	200% deduction on approved R&D activities	150% deduction on expenditure incurred directly for R&D
Comparative comment: The super deduction for R&D in South Africa and other BRICS nations all aim to provide the tax incentives for companies engaging in R&D activities (Deloitte, 2020). The utilisation of additional tax deductions can result in lower tax burdens for companies. In comparison to other countries, South Africa shares a similar alignment, while Brazil offers a more distinct tax super deduction in contrast to other nations. In Brazil,					

taxpayers have the right to claim an extra 60% deduction for investments in technological innovation (KPMG, 2021). This deduction can increase to 80% if an additional 5% of researchers are employed as full-time staff. In addition, a 20% added deduction is applicable for any intellectual property that arises from an innovative project (EY, 2022). In March 2023, the Chinese government made the decision to permanently extend the pre-tax super deduction policy for R&D, applying it to all companies in China (Huld, 2023). In as much as the super deduction from the different BRICS countries have the same objectives, it is important to note that there are differences in the qualifying criteria for the R&D deduction.

Table 4: South African tax credits on R&D activities compared to those of other BRICS countries

Tax Incentive	Brazil	Russia	India	China	South Africa
Tax credits	Up to 13.6% of revenue can be granted as tax credit	50% of taxpayer total payment for a period of one to five years	No incentive	No incentive	No incentive
Comparative comment: Tax credits are only available to Brazil and Russia compared to other BRICS countries. However, the purpose of these tax credits for Brazil and Russia has different objectives. The purpose of the tax credit under the Brazil Technology Innovation Law serves as a financial incentive for companies to invest in R&D projects, develop new products or processes, improve existing technologies, and enhance their overall innovation capabilities (KPMG, 2021). It encourages companies to take risks and explore new avenues of technological advancements, which can have a long-term benefit for the company, industry and the economy as a whole. The tax credit allows companies to reduce their tax liability by deducting a percentage of their qualifying R&D expenses (OECD, 2020). Like Brazil, the aim of the Russian tax credit is to serve as an incentive for companies to invest in R&D activities and to promote technological innovation and to allow the encourage the business to allocate resources towards R&D projects. However, the Russian tax credits have the following features which are different from Brazil. Time period: the tax credit can be claimed for R&D expenses incurred over a period of one to five years (Deloitte, 2020). This					

allows companies to plan and undertake long-term R&D projects with the assurance that they can receive credit for a significant portion of their tax payments. Maximum credit limit: the tax credit cannot exceed 50% of the taxpayer's total payments for the specified period (EY, 2023). This ensures that the credit is reasonable and proportionate to the taxpayers tax liability while providing a meaningful incentive for R&D investment. Whereas the incentives for Brazil are up to 13.65% and it is dependent on the company achieving 4%of its billing in order to claim the deduction (EY, 2023).

Table 5: South African tax exemption incentive on R&D compared to those of other BRICS countries

Tax Incentive	Brazil	Russia	India	China	South Africa
Tax exemption	50% tax exemption on IPI for acquiring assets solely dedicated to R&D initiatives.	VAT exemption granted for select R&D production activities	Imported approved assets for in-house R&D exempted from customs duty	VAT exemption (with refundable input VAT) when offering R&D and offshore outsourcing services	No incentive
Comparative comment: South Africa is the only country in the BRICS alliance that does not have the tax exemption in place for R&D activities. With regards to the other countries, the tax exemptions available are different and serve different purpose. By exempting companies from paying IPI (excise duties) on machinery, equipment and materials used in R&D, the Brazilian government is focused on easing the financial strain and promoting company investment in R&D activities (EY, 2022). The exemption makes it more affordable for companies to acquire the necessary resources and access cutting-edge tools for their research projects. The government's goal in granting IPI exemption is to boost the global competitiveness of Brazilian companies. Starting in 2010, businesses based in the Skolkovo Innovation Centre in Russia can enjoy a tax break on VAT and property taxes. The incentives aim to encourage innovation in various fields such as energy efficiency, nuclear engineering, space technology, medicine, and IT (KPMG, 2021). The tax					

exemption in India and China serves the same purpose as the other tax incentives, with the main aim being for companies to promote technological innovation and to encourage businesses to allocate resources towards R&D projects.

Table 6 South African reduced rates tax incentive compared to those of other BRICS countries

Tax Incentive	Brazil	Russia	India	China	South Africa
Reduced rates (including reduced social security contributions)	A deduction in income tax and social contribution on profit, resulting in a decrease from 10.2% to 12.5%	Reduced rates of social security contributions (from 20% to 15.5%)	Gross royalty income taxed at a reduced rate of 10%, along with any applicable surcharges and taxes	Reduced CIT rate of 15%	No Incentive
Comparative comments: South Africa is the only country in the BRICS alliance that does not provide reduced tax rates as an incentive for R&D activities. The Brazilian Law 13.755/18 was enacted to provide tax incentives to companies involved in the automotive industry. This includes a provision for a maximum 2% decrease in IPI for vehicles that meet the specified criteria in the law. in addition, there is an exemption for import tax on goods that are not produced domestically (Law 13.755/18). Additionally, if the company invests a minimum amount in R&D, they are eligible to claim a deduction of 10.2% to 12.5% on their income tax and social contribution for profit (KPMG, 2021). In Russia, IT companies have access to lower social security contribution rates, ranging between 7.6%, 6.1% and 0.1% depending on the annual compensation. In addition, as of 1 January 2021, IT businesses were qualified to pay a lower 3% corporate income tax rate (EY, 2022). The implementation of the lower corporate tax rate for IT firms starting in 2021 also entailed the elimination of their ability to claim lump-sum deductions for computer equipment expenses rather than through depreciation charges. In order to encourage the retention and commercialization of existing patents and the creation of new innovative patented products, India will offer an extra incentive. Gross royalty incomes are taxed at a reduced rate of 10%, along with any applicable surcharges and taxes (KPMG, 2021). Chinese companies meeting the					

requirements for TASC and HNTE status can take advantage of tax advantages such as a 15% lowered corporate income tax rate under Article 28 of the Law on Enterprise Income Tax (People's Republic of China, 2007). The incentive can only be obtained through a pre-approval process (EY, 2023). The tax incentive introduced by governments in the different BRICS countries vary and they exist in order for companies to invest in R&D activities.

Table 7 South African Tax Incentive on tax holiday incentive compared to those of other BRICS countries

Tax Incentive	Brazil	Russia	India	China	South Africa
Tax holiday	No incentive	A tax-free period of two years granted to individual entrepreneurs involved in R&D projects that follows simplified or patent tax regulations	15 year phased tax holiday on exports for companies in SEZ units	Tax holiday for one of the five SEZs, providing a two-year exemption and a three-year 50% deduction from the initial year of production or operation income	No Incentive
Comparative comments: Brazil and South Africa are the only countries in the BRICS countries without a tax holiday tax incentive on R&D. Entrepreneurs in Russia can take advantage of a tax holiday incentive, which grants a 0% tax rate for two years to those engaged in R&D and using simplified or patent tax systems (KPMG, 2021). Any HNTE that meets the eligibility criteria and is based in any of China's five Special Economic Zones or Shanghai Pudong New Area, as of 1 January 2008, could potentially qualify for a two-year tax exemption, followed by a three-year partial deduction beginning in the first year of generating production or operating profit (EY, 2023). In India, companies offering R&D services could be eligible for incentives if they export their services to a foreign principal (EY, 2023). These companies have the opportunity to establish units in SEZs and enjoy tax benefits. From 1 April 2006 to 31 March 2021, SEZ enterprises that export goods and services are entitled to a 15-year tax holiday that will be implemented over time (Deloitte, 2020). On the other hand, the SEZ unit will not be eligible for the super deduction on research and development costs (Deloitte, 2020).					

Table 8 South African financial assistance on R&D activities compared to those of other BRICS countries

Tax Incent-ive	Brazil	Russia	India	China	South Africa
Financial support, Loans and Grants	Government can finance up to 90% of the total project expenses	Competitive tender processes are utilised to provide direct grants for strategic R&D initiatives in energy efficiency, information technology, medicine, and life sciences	Equity capital or loans are offered by the TDP board to industrial enterprises and research associations	No incentive	SPII Product Process Develop-ment (PPD) programme provides funding for 50% to 85% of eligible expenses during the technical develop-ment stage
Comparison comment: of the selected the BRICS nations, it is only China that does not provide financial assistance to companies that want to engage in R&D activities. Brazilian companies can receive financial aid for new R&D ventures at lower interest rates. The government fund can cover up to 90% of the project expenses. However, before financial support can be granted, pre-approval is required (EY, 2023). In Russia, grants are commonly awarded to companies that partner with a Russian state university, on condition that the company's investment in the project meets or exceeds the amount of funds granted. The project implementation time frame can vary between one and three years, with grant funds ranging from USD 1 to 5 million (EY, 2022). Additionally, manufacturing companies may receive subsidies to cover interest expenses. The Technology Development Program (TDP) of DSIR in India provides grants as financial assistance for industrial R&D projects. Industrial entities and research associations can receive equity capital investments or loans from the Technology Development Board through the TDP programme, which aims to promote the use and advancement of local technology or the adoption of foreign technology (Deloitte, 2020). The Department of Trade, Industry and Competition (DTIC) in South Africa is responsible for					

managing the Support Programme for Industrial Innovation (SPII), which grants financial aid in the form of cash to drive the innovation of new products (Department of Trade, Industry and Competition, 2023). The main objective of the SPII is to support the development phase, which occurs after basic research and concludes with the creation of a pre-production model (Deloitte, 2020). When comparing the financial assistances granted by the different BRICS countries, the eligibility criteria vary; however the main objective of granting financial assistance is the same, which is to incentivise companies to engage in the R&D activities through financial assistance from the government.

5.5 Conclusion

In comparison with BRICS countries, it can be concluded that South African is the country with the least efficient incentive system when compared to the rest of the BRIC countries with regards to the R&D tax incentives. South Africa offers a variety of tax incentives to encourage research and development among businesses, such as deductions and allowances for R&D expenditures however it does not have additional incentives such as tax holiday, reduced tax rates, tax exemptions, and tax credits as compared to the rest of the BRIC countries.

When evaluating the R&D incentives of BRICS nations like Brazil, Russia, India, and China, South Africa's may not match up in terms of monetary benefits. The BRICS member countries all offer R&D tax incentives, but the specific benefits and eligibility requirements vary for each nation. Through the *Lei do Bem* tax deduction, eligible companies in Brazil can enjoy tax incentives for their research and development initiatives by deducting a portion of their R&D costs from their taxable income (PwC, 2012). Companies conducting R&D in Russia can take advantage of tax breaks and reduced social security contributions, as well as a 0% tax rate on profits earned from select forms of intellectual property resulting from their research. In India, eligible companies can receive tax deductions equivalent to 150% of their research and development expenses. China provides a range of tax benefits, subsidies, and

grants for both local and international R&D initiatives. This includes a 200% super deduction on qualifying R&D costs and special tax advantages for high-tech firms.

Chapter 6

Examination of the administrative aspects of the required tax incentives of South Africa in comparison with selected countries

The focus of this chapter will be on the administrative components of the R&D tax incentives. This encompasses pre-approval, evaluating applications for R&D tax relief, and performing audits. The proper monitoring and evaluation of projects depends on reliable firm-level data to facilitate thorough qualitative analysis.

6.1 Brazilian administration requirements for tax incentives

The Ministry of Science, Technology and Innovation (MCTI) holds a significant role in the management of R&D incentives, approving and monitoring the utilisation of tax benefits for eligible projects (EY, 2023). It is the responsibility of the MCTI to assess if innovation projects and expenses comply with R&D regulations. With their specialised abilities, MCTI is the only organisation equipped to thoroughly analyse the projects put forth by companies (EY, 2023). The Brazilian Internal Revenue Services (IRS) maintains its responsibility for auditing incentives that have a tax impact and may or may not conduct investigations into certain accounting and fiscal aspects related to R&D incentives (EY, 2023).

Chapter 8 of the Instruction Notice (IN-RFB 1187/11) regulates the use of benefits in technological innovation. It states the following with regards to the administrative requirements:

> *'Art. 18. The expenditures and payments referred to in this Normative Instruction must be controlled in accounting in specific accounts.*

Art. 19. The legal entity that opts for incentives for technological research and development of technological innovation referred to in this Normative Instruction must demonstrate regularity regarding the discharge of federal taxes and other credits registered in the Union's Active Debt by presenting a Debt Clearance Certificate (CND) or Positive Debt Certificate with Negative Effects (CPD-EN) valid for the 2 (two) semesters of the calendar year in which you make use of the benefits.

Art. 20. The documentation relating to the use of the incentives referred to in this IN must be maintained until any relevant actions are prescribed. The documentation relating to the use of the resources referred to in arts. 12 to 14 must be maintained by ICT and the legal entity available for supervision by the RFB, until any actions that may be relevant to them are prescribed.

Art. 21. Failure to comply with any obligation assumed to obtain the incentives referred to in this Normative Instruction, as well as the improper use of the tax incentives referred to therein, imply loss of the right to incentives and the collection of the amount corresponding to taxes not paid as a result incentives already used, plus fines and interest, late payment or ex officio, provided for in tax legislation, without prejudice to applicable criminal sanctions.'

To stay compliant, companies are obligated to fill out their income tax return every year. Moreover, businesses seeking incentives must hold valid tax clearance certificates for the complete term (Deloitte, 2021).

6.2 Russian administration requirements for tax incentives

Companies must meet certain qualifications and have well-developed plans for research and development in order to confidently claim deductions. Valid documentation must also be provided. Research institutes specializing in various fields of R&D may review the documentation. The preapproval and annual compliance procedures are handled by tax inspection offices (EY, 2022).

In order to receive investment tax credit and reduced profits tax rates for their R&D activities, taxpayers must submit a formal request from the tax authorities and provide supporting details (Deloitte, 2021).

To take advantage of tax incentives for research and development, taxpayers must establish residency in special economic zones, advanced development territories, or the Innovation Centre in Skolkovo. (Deloitte, 2021).

6.3 Indian administration requirements for tax incentives

Section 35(2AB) of the Indian Income Tax Act states the following regarding the administration requirements for the tax incentives*:*

> *'(3) No company shall be entitled for deduction under clause (1) unless it enters into an agreement with the prescribed authority for co-operation in such research and development facility and fulfils such conditions with regard to maintenance of accounts and audit thereof and furnishing of reports in such manner as may be prescribed.*
>
> *(4) The prescribed authority shall submit its report in relation to the approval of the said facility to the Principal Chief Commissioner or Chief Commissioner or Principal Director General or Director General in such form and within such time as may be prescribed.'*

Therefore, in order to claim deduction in India in terms of s35, a company must meet the following criteria:

- Companies should apply for recognition of their in-house R&D facilities through the Department of Science and Industrial Research (DSIR).
- The recognised in-house R&D facility must submit an application in the prescribed form to DSIR in order to request approval for claiming a deduction.

- To stay in compliance, it is necessary to keep separate accounts for each in-house R&D facility and undergo audits on these accounts to secure approval for eligible R&D expenditures.

6.4 Chinese administration requirements for tax incentives

6.4.1 Administrative requirements for HNTE

Companies seeking HNTE status must apply to the Ministry of Science and Technology by going through their provincial branch. The annual application season will be determined by the particular city or province. Once approved, HNTE certificates will remain valid for three years starting from the date of issuance (US-China Business Council, 2013).

Below are a number of steps that need to be followed in order for the company to be granted the HNTE certification:

Step 1: Self-assessment and application by the enterprises

Businesses that meet the HNTE standards through self-assessment must register with the Network for Administration of HNTE and apply for accreditation from the relevant authority (Zhou, 2023). Concurrently, the applicants are expected to furnish essential paperwork verifying their expertise, which includes materials related to intellectual property, details about the company's staff and technical team, and financial reports from the previous three years (Zhou, 2023).

Step 2: Expert assessment

The HNTE accreditation authority will randomly select individuals who meet the evaluation requirements to form an expert panel. This panel will then evaluate the enterprise's declaration materials and make a judgement (Zhou, 2023).

Step 3: Review and public comments

The National HNTE Leading Team office will receive an accreditation opinion after the accreditation authority evaluates the applicants and takes into account the expert panel's assessment. A notice of approved HNTEs will be released on the Network for Administration of Accreditation of HNTE and will be displayed for ten working days (Zhou, 2023).

Step 4: Accreditation and certification

The Network for Administration of Accreditation of HNTE will publicly release the recorded HNTE list and award a standardised HNTE Certificate to eligible businesses unless any objections are raised. In the event of any objection, the accreditation authority must investigate and take appropriate action (Zhou, 2023).

If all the necessary components are in place, the complete process typically takes about 60 business days.

Government preapproval or record filing is a necessary requirement to receive R&D tax benefits. All necessary information, such as the R&D project budget, detailed project descriptions, and meeting documents showing approval from management or the board, must be provided to the government by taxpayers (EY, 2023).

6.4.2 Administrative requirements for TASC

Companies have the option of conducting self-assessment in alignment with the Guidelines for Evaluating TASC (Guo Ke Fa Zheng [2017] No.115) and are required to complete the enterprise information on a voluntary basis on the National Information Service Platform for TASCs (Zhou, 2023).

Within five business days, the relevant institutions organized by the provincial-level science and technology administrative departments shall verify the accuracy of the TASCs Information Form completed by enterprises. Companies that have all the necessary information and meet the specified requirements will be announced on the Service Platform for a period of ten business days. In the event that no public

objections are raised, businesses will be included in the National Information Database for TASCs (commonly known as the TSME Database) and issued a TSME registration number, valid from the date of publication until December 31 of the same year (Deloitte, 2015).

As illustrated above, the administrative requirements for R&D tax incentives in BRICS countries in comparison with South Africa vary. However, the administrative requirement across the different BRICs countries generally includes the following:

Registration process: companies interested in claiming R&D tax incentives need to register with the relevant tax authority. This registration process typically involves submission of an application form and supporting documents to demonstrate eligibility.

Documentation requirements: Companies are obligated to retain detailed documentation of their research and development undertakings, encompassing project plans, technical report, and financial records. These documentations are necessary to support the R&D tax incentive claim and may be subject to review by the tax authority.

Reporting obligations: companies claiming R&D incentives are usually required to submit regular reports to the tax authority. These reports may include information on the progress of R&D projects, expenditure incurred, and the outcome achieved.

Record keeping: companies must maintain accurate and up-to date records of their R&D activities and associated expenditure. These records should be retained for a period, as determined by the tax authority.

Compliance: companies claiming RD tax incentives must comply with all relevant tax regulations including filing tax returns and paying any applicable taxes.

6.5 Conclusion

The BRICS countries have diverse administrative prerequisites for R&D tax incentives, although they typically encompass documenting R&D projects, innovation, and expenditures. Each country has its own specific regulations and guideline for claiming R&D tax incentives, and businesses must comply with these regulations to qualify for the incentives.

When comparing the administrative requirements for R&D tax incentives in the BRICS countries to those in South Africa, it is clear that there are similarities and differences in the documentation and compliance standards. In South Africa the administrative requirements for R&D involves detailed documentation that demonstrates the scientific or technological nature of the research activities, the expenses incurred, and the innovation achieved. This documentation must be submitted in accordance with the prescribed procedures and guidelines to qualify for the R&D tax benefits in South Africa.

The BRICS nations, including Brazil, Russia, India, and China, share similarities in terms of their R&D processes and tax incentive requirements which necessitates thorough documentation of the R&D activities, innovation and expenditure. In order to fully benefit from tax relief opportunities for their R&D activities, companies operating in these nations must comply with specific regulations and guidelines set by each of the BRICS countries, as they all have their own unique regulations and guidelines.

Chapter 7

Evaluation and assessment strategies used by different countries to ensure the effectiveness of their R&D tax incentives

The effectiveness of tax incentives for R&D in the BRICS countries can be analysed based on several factors, taking into account the unique economic and regulatory environments of each member nation.

R&D investment and expenditure: The effectiveness of R&D tax incentives can be measured by examining their ability to encourage R&D investment and spending. This involves evaluating the amount of R&D expenditure by companies and the extent to which tax incentives play a role in this investment.

Innovation output and intellectual property: The effectiveness of tax incentives holds great significance in the advancement of intellectual property, including patents, trademarks, and copyright. The assessment of the quantity and quality of innovative breakthroughs driven by R&D tax incentives can offer valuable insights into their capacity to stimulate innovation.

Economic growth and competitiveness: assessing the significance of R&D tax incentives in the development and competitive landscape of BRICS nations is crucial.

According to the 2023 Global Competitive Report, China was ranked 21st globally with a score of 82.10, taking the lead among other BRICS nations such as the Russian Federation (56.36, 45th) per 2021 results, India (64.63, 40th), South Africa (40.19, 61st), and Brazil (42.09, 60th) (World Economic Forum, 2023). Russia was not included in the 2023 global competitive results; this is due to the limited reliability

of the data collected as a result of the war between Russia and Ukraine (World Economic Forum, 2023).

Evaluating the number of patent applications and grants is a common method used to gauge the intellectual property rights (IPR) performance of BRICS countries. The number of patent applications received by the National Intellectual Property Administration of China (CNIPA) in 2022 increased by 2.1% compared to 2021. This has been a consistent trend since 2015, with CNIPA receiving over a million applications annually. Brazil recorded 24,759 patent applications, Russia (26,924), India (77,068), and South Africa (13,990) (World Intellectual Property Organization, 2023)

In 2022, China was ranked among the top 10 countries for granting the most patents, surpassing its number from the previous year, showing a growth rate of 14.7%. South Africa experienced a significant increase of 84.5% in patent grants in 2022, surpassing its numbers from the previous year. The primary reason for the increase can be attributed to a robust growth in non-resident grants. The number of patents issued in Brazil decreased by 12.4% in 2022 compared to 2021, mainly due to a decrease in both resident and non-resident grants. In 2022, India saw a 15.5% increase in granted patents, while Russia's numbers rose by 17.66% compared to 2021 (World Intellectual Property Organization, 2023).

7.1 Effectiveness of R&D tax incentives in Brazil

In the past two decades, Brazil has made significant efforts to modernise its policies and institutions in order to advance R&D and innovation. As a result, the country has emerged as a pioneer in innovation within specific “islands of productive excellence”, industries like oil and gas, aviation, agriculture, and the health field (Deloitte, 2020). Despite efforts to improve innovation, the system as a whole remains inadequate and has failed to generate productivity growth, boost competitiveness, or strengthen

global market presence (World Economic Forum, 2018). Despite the rise in the number of doctorates and scientific publications, there has been no significant boost in innovation in Brazil as evidenced by the minimal increase in patent registrations by Brazilians in the past two decades (Figueiredo, 2024).

Companies continue to be the primary contributor to R&D investment in OECD economies, making up an average of 70% (OECD, 2017). Business expenditure accounts for only half of the total R&D in Brazil. The ICT sector made up around 15% of this expenditure in 2014 (the latest year for which data are available) (OECD, 2018). The Brazilian B-index has been consistent for the past decade, reaching a value of around 0.27 (OECD, 2024). Brazil allocated 1.15% of GDP to R&D in 2020, which includes contributions from both public and private sectors. The reason for the stagnant growth in R&D expenditure as a percentage of GDP is due to, the majority of companies in Brazil that innovate typically opt for slight modifications and innovative replicas, rather than major overhauls to existing technologies or creating new ones (Figueiredo, 2024).

According to research study titled “Impacts of the Brazilian innovation tax policy on the composition of private investments and on the type of innovation” conducted by Cruz (2022), the introduction of tax incentives for R&D resulted in the following effects: (a) an increase in overall R&D investment, leading to a greater focus on R&D in most innovative projects (b) the implementation of the policy led to an increase in the employment of researchers who held an undergraduate degree, but did not significantly affect those with higher levels of education and (c) the data did not support the notion that the policy had any influence on the balance between product and process innovation (Cruz, 2022).

In a study performed by the OECD on digital innovation in Brazil, the OECD made the following recommended amendments to the tax policy in order for the Brazilian government to increase investments in R&D:

- Formulate precise strategies for growth in critical digital technologies, such as artificial intelligence and data analytics, in partnership with sector-specific departments and private stakeholders.
- Foster the development of the public sector's procurement capabilities for state of the art and forward-thinking solutions, leveraging insights from the business and institutional sectors.
- Re-evaluate the current allocation of CAPES scholarships to prioritise financial support for STEM graduates and PhDs in engineering, natural sciences, and ICT. Expand the selection of Master's and PhD programmes offered in these fields, in co-operation with the private sector.
- Encourage the utilisation of English in courses and facilitate the transfer of knowledge and expertise from the business sector to academia in order to make Brazil's higher education institutions more appealing to foreign students.

- Amend the Informatics Law to reinforce its promotion of innovation. In particular, broaden the incentives for ICT services and businesses conducting R&D in digital technologies across all sectors; amend the calculation of the tax credit to motivate companies to invest in R&D beyond the mandatory threshold outlined in the law; and enhance the coordination of R&D funding for collaborative research in accordance with the innovation goals.
- Locate and empower innovation centres for the purpose of conducting experiments and transferring technology to small and medium-sized businesses and develop a viable co-financing strategy for the private sector.
- The Good Law could be amended to include cash-refund or carry-forward provisions in order to better accommodate young and innovative companies.
- Set up a convenient hub for start-ups to obtain information on various support programmes. Examine the current initiatives in place to improve efficiency and expand the most successful strategies, while also providing the

government with the opportunity to obtain innovative solutions from start-up ventures.

7.2 Effectiveness of R&D tax incentives in Russia

The gross expenditure on research and development (GERD) of Russia increased by 10% over the previous year to surpass 1.4 trillion Russian rubles in 2022.. Within the Russian economy, scientific pursuits employ nearly 0.8% of all those working in the national economy and generate 1.4% of GDP (Klepach, Vodovatov, and Dmitrieva, 2022). The following are the main achievements in Russia's R&D:

- A cluster of institutions, such as Rosnano, NTI, Skolkovo, RVC, and the Foundation for Assistance to Small Science and Technological Sphere (FSI Enterprises), have come together in the field of innovation to drive forward technological and entrepreneurial development.
- The national Science and Universities project has increased funding for massive science classroom installations and implemented a grant programme to support scientists and their research projects.
- The field of science saw a significant increase in salaries from 2013 to 2020, coinciding with a rise in the influx of young professionals and researchers.
- Significant progress has been achieved in the realm of technology, specifically in the areas of nanotubes, vaccines, composites, supercomputers, artificial intelligence, nuclear technologies, lasers, and hypersound.

The Innovative Development Strategy, established in 2011, set out to elevate the innovative pursuits of enterprises and optimise the process of translating scientific concepts into cutting-edge technologies and market breakthroughs. However, the majority of the objectives set forth were not met, specifically with regard to the intended allocation of domestic expenditure towards research and development,

which was initially planned to reach 3% of the GDP in 2020, yet ultimately amounted to only 1.09%. The indicator of R&D expenses relative to GDP has been stagnating for almost 13 years (Klepach, Vodovatov and Dmitrieva, 2022). The challenges that have accumulated over the course of several years have dramatically elevated due to the hybrid conflict initiated by West against Russia, which entails measures to isolate the Russian scientific community from the international scientific sphere and impose a technological blockade (Klepach, Vodovatov and Dmitrieva, 2022).

The Russian B-index has been consistent for the past decade, reaching a value of around 0.11 (OECD, 2024).

7.3 Effectiveness of R&D tax incentives in India

The Indian government initially granted a 200% tax deduction for research and development expenditures in 2011, but this was later lowered to 150% in 2016 and eventually reduced to 100% in 2020 (Kaushik, 2023). According to a survey carried out by the DSIR in India, companies have stated that the reduction of tax incentives allocated to currently operating manufacturing units for conducting research and development will result in a plunge in R&D investments and thus will have a negative impact on new product development in India (Department of Science, Technology and Innovation, 2019). The Indian government and public sector are responsible for most research and development, but there has been a notable increase in the participation of the business sector. Over the years, India's R&D expenditure has consistently risen, but its proportion of GDP allocated to public investment has remained stagnant for the past two decades. It has remained constant at around 0.6% to 0.7% of GDP (Department of Science, Technology and Innovation, 2019).

Based on a research study performed by the DST in 2019, the following issues were identified with R&D in India that hindered investment in R&D (Department of Science, Technology and Innovation, 2019):

- There is a lack of coordination and connection among R&D projects carried out by various departments of the government.
- The public sector takes on a more prominent role in Indian R&D ecosystem, while the private sector plays a subordinate role. This is in contrast to the situation in advanced countries.
- When it comes to R&D investment, there is no relationship between one public sector unit (PSU) and another. Furthermore, there is no established structure for connecting PSU investments in R&D with academic institutions.
- No independent unit is responsible for the systematic monitoring or evaluation of R&D projects.
- There is a lack of designated funds for R&D and insufficient financial support for state-level research initiatives.

7.4 Effectiveness of R&D tax incentives in China

China's growth strategy focuses on innovation, incentivising companies to enhance their R&D and innovation efforts (Dai and Chapman, 2022). As a crucial element of their strategy to drive innovation-led progress, the Chinese government implemented HNTE. This programme aims to incentivise selected companies by providing a lower corporate tax rate, with the goal of promoting growth in R&D as well as patent creation. The benefits of innovation are not evenly distributed among all firms. In fact, the impacts can vary greatly (Dai and Chapman, 2022).

Over the past two decades, China has experienced a notable surge in R&D and innovation. The annual growth rates of R&D spending have consistently surpassed

18%. The total value of R&D investments in China has risen sharply from 89.6 billion RMB in 2000 to 2,173.7 billion RMB in 2019. During this period, the number of domestic invention patents filed also saw a significant growth, increasing from 51,000 to 1,401,000 (Dai and Chapman, 2022).

In an effort to promote increased R&D research among enterprises, the government has implemented preferential tax policies. However, the lack of a comprehensive policy framework remains a challenge. For example, a lack of cohesive legal structure has resulted in numerous preferential tax policies being implemented through notice and method, scattered in the tax law (Ding, Wu and Long, 2023). The preferential tax policy's effectiveness is hindered by inadequate cohesion and transparency during implementation. Enterprises that are just starting out may not be able to take advantage of tax incentives due to potential losses or low profits (Ding, Wu and Long, 2023). The existing tax incentives for technology innovation primarily target the downstream sector of the industrial chain, with a focus on outcomes rather than the process. The privilege of preferential policies is reserved for successful R&D enterprises, while others are restricted from accessing them until they have reached maturity (Ding, Wu and Long, 2023).

The Chinese B-index increased from 0.15 to 0.23 for larger firms in 2017 and has been consistent (OECD, 2024).

Table 9 Comparison of the effectiveness of R&D tax incentives in the BRICS countries

	Brazil	**Russia**	**India**	**China**	**South Africa**
R&D expenditure as a percentage of GDP	1.15% of GDP	1.4% of GDP	0.7% of GDP	2.56% of GDP	0.62% of GDP
Patents registered	24759	26924	77068	1.6 million	13990

Economic growth and competitive-ness (Based on 2023 results)	60th	45th	40th	21st	61st

In comparison with the BRICS countries, South Africa is lagging in terms of global economic competitiveness as well as in patent applications and R&D expenditure as a percentage of GDP. This might be a result of economic challenges faced by South Africa, which include the high unemployment rate, inequality, poverty, fiscal constraints, compromised governance, and corruption. China is one of the world's largest economies, despite all the challenges that it faces as a country.

7.5 Conclusion

The tax incentives aim to stimulate R&D investment by providing tax relief. As seen in the chapter, there has been an increase in the number of applications for R&D development in each of the BRICS countries.

China has demonstrated significant success in promoting R&D through a combination of tax incentives, investment and policy support. The tax incentives implemented by the BRICS nations has contributed to increased investments, knowledge creation and the development of new products and technologies.

Chapter 8

Proposed refinements introduced by DSI

This chapter will focus on the refinements introduced by the South African DSI in collaboration with the National Treasury.

As reported in the 2021 Budget Review, the government initiated a review of R&D tax incentives. The National Treasury and DSI jointly released a discussion paper on 15 December 2021, inviting public feedback on the effectiveness of South Africa's R&D tax incentives, titled “Reviewing the design, implementation and impact of South Africa’s Research and Development tax incentives”. The review aimed to evaluate the necessity of extending R&D tax incentives beyond their sunset date and recommend any necessary modifications. Following the review, the government determined that R&D tax incentives should be maintained but acknowledged importance of refining the definition of R&D (National Treasury, 2021).

The National Treasury announced proposed changes to section 11D of the Income Tax Act in a media release on 7 October 2022. The public was encouraged to submit written comments to the National Treasury regarding the proposed changes mentioned below by 7 November 2022.

8.1 Refinements in the definition of R&D

The purpose of the change in the definition was to simplify the definition of R&D to facilitate understanding and evaluation, leading to a streamlined application process (National Treasury, 2022).

Section 11D(1) replaced the term “research and development” with “scientific or technological research and development” in the definition of scientific or technological research.

The reason for this change was to emphasise that the incentive was always intended to be applicable solely to activities aimed at resolving a scientific or technological uncertainty (National Treasury, 2022).

The refined definition further incorporates an assessment to ascertain if a qualified individual in the specific field, equipped with the necessary knowledge and competencies, and having access to publicly accessible information, would resolve any scientific or technological uncertainty without undertaking any R&D activities (National Treasury, 2022).

Section 11D (1)(a) replaced the word “non-obvious” with “new” scientific or technological knowledge and section 11D(1)(b) was completely changed to focus on creating or developing new or significantly improved products, processes or services.

The reason for the change was that the Department wanted to shift the focus from a strict result-driven or IP law perspective, to acknowledge the fact that research and development comes with uncertainty and risk, and that it is unrealistic to expect taxpayers to possess extensive understanding of the outcome of their planned R&D activities at the time of applying for the incentive (National Treasury, 2022)

The Department made an effort to implement the principles described in the OECD Frascati Manual (OECD, 2015), particularly those that classify activities as new, uncertain, systematic and transferable and/or reproducible (National Treasury, 2022) .

Section 11D(1)(c) was completely removed from the legislation. The reason for this approach was to remove the requirement of being "innovative," as it has resulted in unintended complications and misinterpretation (National Treasury, 2022).

8.2 Refinements on the exclusion provision

S11D (1) (b) was removed from the exclusion provision. The reason for the exclusion was that the creation of internal business procedures not primarily for sale or licensing might be applicable to various industries, including manufacturing and software development. Throughout the years, the understanding and application of this exclusion has resulted in unintended repercussions (National Treasury, 2022).

The document for discussion included multiple examples that demonstrated how the current interpretation of the internal business process exception could potentially exclude activities that would otherwise be deemed eligible, that encompass the positive outcomes aimed for by the incentives (National Treasury, 2022). As a result, if a project involves a systematic investigation or systematic experimentation to tackle a scientific or technological uncertainty and meets the revised definition of R&D for this incentive, it should be considered R&D irrespective of whether it is meant for sale or use (National Treasury, 2022).

The exclusion will still apply to business processes used for management and administrative purposes, to clarify that it does not qualify as R&D for this incentive (National Treasury, 2022).

8.3 Refinements on the pre-approval process

Section 11D(2)(a)(iv) includes the time frame during which the expenditure should be incurred.

Initially, only costs incurred after the Department of Science and Innovation have received an application were qualified for a 150% deduction under section 11D. Due to this, many taxpayers who are not familiar with the incentive, as well as smaller taxpayers, have either missed out on the chance to take advantage of it or hastily

submitted incomplete applications for the committee to review and decide on those applications. Therefore, a six-month grace period would be implemented for pre-approval applications to accommodate smaller, new, or innovative R&D applicants who may need additional time to gather information about their proposed activities, with the intention of improving their capacity to provide detailed information and consequently receive the incentive (National Treasury, 2022).

The abovementioned refinements were effective from 1 January 2024.

8.4 Conclusion

The refinement of R&D tax incentives in South Africa is a significant progression in fuelling innovation, propelling economic advancement, and elevating the country's global competitiveness (Department of Science and Innovation, 2022). In order to promote economic development and employment growth, the government is offering incentives to companies for investing in R&D activities. To optimise R&D tax incentives, a comprehensive approach that emphasises accessibility, strategic alignment, monitoring and evaluation, and transparency and accountability is crucial (OECD, 2022). The recent refinements to tax legislation were primarily geared towards promoting accessibility and inclusivity (National Treasury, 2022). This was achieved by streamlining the tax incentive criteria to cater to a wider range of companies, including SMEs in order to simplify the application process, thereby encouraging broader participation. The introduction of a six-month grace period for companies, including small businesses, to provide detailed information allowed for increased accessibility and inclusion in regard to the tax incentive. The accessibility and inclusivity were also noticeable in the exclusion of internal business processes that were not available for purchase or use. This expands the scope of R&D activities and industries that can now benefit from tax incentives.

Chapter 9

Potential improvements to South African tax incentives for R&D

Through an examination of the key issues discussed in the previous chapters, potential solutions emerged for the government to strengthen the effectiveness and implementation of the R&D tax incentive, with a focus on enhancing its appeal and encouraging wider adoption.

This chapter will focus on potential improvements that can be introduced to the South African R&D tax provisions to align them with international best practice. It will focus primarily on shortcomings in the current provisions and how to rectify them. When considering potential improvements to South Africa R&D there are valuable lessons that can be drawn from the approaches of the selected BRICS countries.

Improving the tax incentives for R&D in South Africa is crucial for fostering innovation and economic growth. Here are a few ways in which the South African government can enhance these incentives.

9.1 Simplifying the application process

South Africa has two ways in which R&D application form can be submitted, either through the online platform or submission of the RD2 application form by downloading the form and submitting it via email (Department of Science and Innovation, 2024).

South Africa is currently struggling with the backlog in the administration of application forms, approval of applications as well as the granting of the R&D tax incentives to companies that meet the qualifying criteria. According to the DSI's

report to parliament for 2020-21, programme has not achieved its target of reaching decisions on a number of applications within 90 days, despite making progress in turnaround time. (Department of Science and Innovation, 2024). The DSI stated that the timeframe for application processing largely relies on the accuracy of the information provided, and that they are consistently seeking ways to enhance their turnaround target, which includes holding meetings to raise awareness of the program, enlisting outside experts to evaluate applications, and implementing an online platform for submitting applications (Department of Science and Innovation, 2024). South Africa can learn from other BRICS countries on how to streamline the application process for claiming R&D tax incentives, in order to reduce administrative burden on companies. The DSI should shift more towards online application processes and the use of technology to reduce the backlog.

The following are some activities that are implemented in other BRICS countries to streamline the application process and reduce the administrative burden on the department and the applicants.

China has made efforts to provide comprehensive guidance and resources through online portals and government websites ensuring that eligible companies can easily understand the requirements and steps involved in applying for incentives. China has also implemented digital platforms and streamlined procedures to expedite the review and approval of R&D tax incentive applications. This has helped to reduce the administrative burden and minimise delays in accessing benefits, allowing companies to invest more quickly in innovation projects (Zhou, 2023). The Chinese government has further introduced a feedback mechanism that allows continuous improvements of the application process (Zhou, 2023). The purpose of the this is to ensure that the government gathers feedback from applicants to identify areas for enhancements, address common challenges and streamline procedure further, thus optimising the effectiveness of the application process over time. The turnaround time for the R&D application process in China is 60 working days (Zhou, 2023).

The effectiveness of the application process for R&D tax incentives depends on its ability to provide an accessible, efficient, transparent and supportive mechanism for companies seeking to leverage incentives to drive innovation. Continuous monitoring, evaluation and improvement of the application process are essential to ensure that it remains effective in supporting R&D activities across various industries.

9.2 Industry-specific incentives

South Africa should tailor tax incentives to key industries or sectors, promoting R&D activities that align with national development strategies and priorities. The purpose of these incentives is to stimulate innovation, enhance competitiveness and drive economic growth in key industries. Currently South Africa is offering a blanket incentive to different companies irrespective of the sector or industry in which they operate in for R&D investment. Companies engaged in greenfield investment, which refers to new industrial projects utilising new and unused manufacturing assets, are eligible for tax allowances under section 12I of the Income Tax Act, as part of this, there are also brownfield investments, which encompass the development or modernisation of current industrial projects (Income Tax Act, 1962, s12I). Specific areas of focus have been identified by the Industrial Policy Action Plan (IPAP) for policy and programmes improvements to enhance the manufacturing and other value-adding sectors. Its aim is to foster the development of decent employment prospects and improve value-adding capabilities and competitiveness in both domestic and export sectors (Department of Trade and Industry, 2022). In order to encourage R&D, the DSI should provide a specified tax incentive for various sectors such as agroprocessing, mineral beneficiation, chemicals, cosmetics,

pharmaceuticals and plastics, as well as electrotechnical and IT (Department of Trade and Industry, 2022).

South Africa can learn and implement the following industry-specific tax incentives which are currently implemented by other BRICS nations. These industry-specific tax incentives play a crucial role in promoting R&D activities, fostering innovation and driving economic growth. Companies that take advantage of these incentives will be able to enhance their competitiveness, create new job opportunities and contribute to the country's development in strategic sectors.

China offers preferential tax policies for qualified high-tech companies with HNTE status that engage in R&D activities. Included in the policies are a 10% decrease in corporate income tax from 25% to 15%, extra deductions for R&D costs, and relief from select taxes (Deloitte, 2022).

Brazil provides the following industry-specific tax incentives for companies that engage in R&D activities:

- The *Lei do Bam* (Good Law) in Brazil provides incentives in for companies that engage in technological innovation and R&D activities. It allows the company to deduct a percentage of their R&D expenses from their taxable income (KPMG, 2021).
- Software and information technology companies are eligible for various tax incentives to support R&D efforts. These incentives may include deductions from software royalties, and exemption from VAT for certain software products. Companies that engage in software development in Brazil are eligible for tax incentives such as exemptions and reduction in taxes (EY, 2023).
- Biotechnology and pharmaceutical sector companies benefit from tax incentives aimed at encouraging R&D investment in healthcare innovation. Possible incentives could involve tax breaks for R&D costs associated with pharmaceutical development, lower tax percentages on profits generated

from the sale of patented medications, and tax exemptions for approved medical goods (Deloitte, 2022).

- Companies involved in the automotive industry in Brazil, including manufacturers, importers, and auto parts makers, may qualify for tax incentives for up to five years if they engage in strategic automotive-related research and development: an exemption from import duty for imported parts and components to be used in the manufacturing of automotive products and a 2% reduction of the excise tax on vehicles that meet certain requirements related to energy efficiency and other performance indicators (EY, 2023).

The Russian Skolkovo Innovation Centre provides various tax benefits, grants and subsidies to support R&D projects in priority sector s such as IT, biomedicine, energy efficiency and space technologies. Companies located in the Skolkovo ecosystem can access tax breaks on profit, property taxes and land taxes (EY, 2022).

9.3 Patent box regime

The intellectual property regime, commonly known as the patent box, is a tax incentive programme designed to provide advantageous tax treatment for profits generated from intellectual property assets like patents, trademarks, and copyrights (EY, 2023). Patent box regimes have been implemented by both China and India as a means to incentivise innovation, advance technology, and facilitate the commercialisation of intellectual property.

South Africa should introduce a patent box regime by reducing the rate on profits derived from patent technologies development in the country. Further to the modified section 11D of the Income Tax Act which attempted to move away from end results of R&D because it is difficult for taxpayers to explain or prove upfront, it will be worthwhile for the DSI to provide additional incentives for companies that managed

to actualise their R&D activities into patented activities (Department of Science and Innovation, 2022).

South Africa can learn the following from India and China which have implemented patent box regimes. Indian residents who hold a patent that was developed and registered in India may be subject to a 10% tax (plus surcharge) on their gross royalty income (Deloitte, 2022). China's patent box regime functions differently compared to India. It specifically caters to technology and software companies and offers the following benefits:

Income up to five million CNY per year from qualified technology transfers (including non-exclusive licenses with a minimum term of five years) is exempt from income tax; earning over CNY five million per year will be taxed at 50% of the standard income tax rate (Deloitte, 2022).

In 2022, China was ranked among the top 10 countries for granting the most patents, surpassing its number from the previous year. It showed a growth rate of 14.7%, while India’s growth rate of patents granted was 15.5% from 2021 to 2022. The growth in patent applications and grants can be attributed to the patent box system, which has acted as a catalyst for innovation, development of technology, and economic progress by encouraging companies to prioritise investments in R&D, protecting their intellectual property and leveraging their innovations for competitive advantage (World Intellectual Property Organization, 2023).

9.4 R&D tax credits for start-ups

Due to their tax loss position and limited cash flow, start-ups do not fully benefit from the incentives until they are able to pay taxes, which makes the incentives less attractive for them. An R&D tax credit can be introduced by the South African tax authorities as it will serve as a significant and immediate cash source.

Introducing these targeted incentives for start-ups will assist in stimulating innovation in their early stages, will help the companies to overcome the financial barriers associated with R&D.

Although the BRICS nations do not have specified legislation that caters for R&D tax incentives for start-ups, they have implemented the following provisions which South Africa can learn from:

Companies in Brazil have the opportunity to receive a 13.65% tax credit on incentivised products, as long as they invest a minimum of 4% of their sales in R&D initiatives (Deloitte, 2020).

Taxpayers in Russia can take advantage of an investment tax credit, which can last between one and five years and is limited to 50% of their R&D expenses (EY, 2022).

Furthermore, tax holidays can be introduced for start-ups whereby companies that engage in R&D activities receive a temporary exemption or reduction in corporate income tax. For a duration of two years, Russian entrepreneurs can take advantage of a tax holiday (EY, 2022).

Table 10: Lesson learned and potential improvements to South African R&D tax incentives provisions

Improvements	**Best practice in BRICS countries**	**South Africa**
Administrative process: Turnaround time	China has implemented 60 days.	90 days
Application process	China and India have incorporated digital platforms and streamlined procedures	South Africa has tried to offer applicants clear guidance and support; however it still relies on downloading application forms and submitting them via email

Patent box regime	China and India have implemented a patent box regime by reducing the rate on profits derived from patent technology development.	South Africa does not have this incentive in place
Industry-specific tax incentives	China offers preferential tax policies for qualifying high-tech companies with HNTE status that engage in R&D activities. Companies in the automotive industries can enjoy a 2% reduction in the IPI (excise tax) in Brazil. Russia's Skolkovo Innovation Centre companies are entitled to tax breaks on profit, property taxes and land taxes	s11D provides a blanket tax incentive on R&D activities to all sectors
Incentives for start-ups	Businesses in Brazil can claim a tax credit of 13.65% on the sales of incentive products. Taxpayers in Russia can take advantage of an investment tax credit, which can last between one and five years and is limited to 50% of their R&D expenses. For a duration of two years, Russian entrepreneurs can take advantage of a tax holiday	No specific tax incentives on R&D for start-ups

By implementing these measures, South Africa can create a more supportive environment for R&D, driving technological advancement and competitiveness in the global market. The short-term impact of introducing new tax incentives in South Africa will be a burden on the fiscus. However, the long-term effect of these incentives will be seen in companies dedicating more resources towards research and development, leading to the creation of new products, and ultimately generating higher revenue and increased tax revenue.

Chapter 10

Conclusion

In the current climate, innovation has taken on a heightened level of importance worldwide, resulting in a strong focus on implementing policies that encourage it and consequently boosting economic growth. The BRICS countries, including South Africa, have prioritised the stimulation of innovation and technological advancement by implementing tax incentives for R&D, in accordance with the current trend of incentivising R&D efforts globally.

The aim of this research project was to compare South African R&D tax policies with those countries that are members of BRICS alliance (before its recent expansion, namely Brazil, Russia, India, and China) and explore potential improvements.

Through the evaluation of several aspects, including eligibility criteria, application process, and tax incentives, the research report has shed light on the effectiveness and impact of R&D in driving innovation and economic growth. In the comparison with the BRICS countries, several key findings have emerged: R&D tax incentives are a critical element in promoting investment in innovation by easing the financial burden for companies conducting R&D. By providing these incentives, companies are prompted to focus their resources on research and development, ultimately driving technological progress, product innovation, and enhanced competitiveness. Simplifying application processes and ensuring easy access to R&D tax incentives are crucial elements in achieving maximum participation and effectiveness. China and India have incorporated digital platforms and streamlined procedures, while Brazil and South Africa have striven to offer applicants clear guidance and support. By tailoring R&D tax incentives to specific industries, such as information technology, biotechnology, and other key strategic sectors, innovation within these fields can be further stimulated. These targeted incentives play a crucial role in addressing

challenges specific to each sector and its priorities, driving growth and development in critical areas of the economy. A comparative study of R&D tax incentive schemes among the BRICS nations provides valuable insights into best practices, policy effectiveness, and lessons learned. Although the BRICS countries differ in their methods of providing tax incentives for R&D, there are opportunities for knowledge sharing and working together to improve policy results and cultivate innovation ecosystems.

It is commendable to witness that the DSI has made notable strides in rectifying the challenges previously encountered by the R&D tax incentive initiative through the implementation of numerous propositions in its joint efforts with National Treasury. A collaborative effort between the DSI and National Treasury has yielded a discussion paper regarding the evaluation of tax incentives for research and development in South Africa, with the public being afforded the opportunity to submit their comments (National Treasury, 2022). The reviews have led to the refinement of section 11D of the Income Tax Act, making it more efficient and simplified. Nonetheless, there remains room for improvement to ensure that the incentive better aligns with the interests of a wider spectrum of companies. This involves exploring the potential adoption of the patent box system for companies involved in R&D, streamlining the application process to facilitate accessibility, transparency, and support for R&D applicants, as well as introducing industry-specific incentives and tax credits for start-ups.

To deepen understanding, effectiveness, and optimisation of these incentivised programmes, further exploration of various key aspects of R&D is necessary. Potential areas for future research may include carrying out a sector-specific analysis to acquire a thorough understanding of the distinctive challenges, opportunities, and outcomes linked to R&D tax incentives in different sectors, such as manufacturing, technology, healthcare, and energy. This study has the potential to provide valuable insights for focused policy initiatives and industry-specific support

aimed at enhancing innovation and competitiveness. Another potential research topic would be to explore the impact of R&D tax incentives on SMEs, a group that frequently encounters distinct challenges in accessing and utilising these incentives compared to larger firms. By conducting this research, potential strategies could be uncovered for optimising incentive programmes in order to effectively address the specific needs of SMEs and facilitate their growth and innovation initiatives.

In summary, R&D tax incentives are a vital tool for driving growth through innovation and enhancing global competitiveness. By creating a supportive atmosphere for R&D initiatives, nations can harness the full potential of their innovation ecosystems and establish a framework for long-term economic success in the digital age.

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