

**2016 Southern African Accounting
Association (SAAA)
National Teaching and Learning and
Regional Conference Proceedings**

ISBN number: 978-0-620-74761-5



**TAX 04: Has the changing research and development
taxation legislation affected research and development
output in South Africa?**

**Riley Carpenter
University of Cape Town**

ABSTRACT

National Treasury and the South African Revenue Service introduced section 11D into the Income Tax Act No. 58 of 1962 in the 2007 Taxation Laws Amendment Act, effective from November 2006. This section incentivises investment in research and development through an attractive tax regime for qualifying expenditure. Since section 11D's introduction into the Income Tax Act, it has undergone multiple amendments. These amendments have attempted to meet the section's objective of higher domestic productivity, economic growth, increased employment levels and better skills development through creating a more robust definition of research and development, improving the innovative nature of research and development and shifting the focus to more scientific and technological pursuits. The objectives as defined in the Explanatory Memorandum on the Taxation Laws Amendment Acts have been met, but evidence from the Department of Science and Technology and the South African Revenue Service indicate that research and development output has increased only marginally, and may have been significantly lower had there been no tax incentive.

Keywords: income tax, taxation, research and development, section 11D, innovation, National Survey of Research and Experimental Development, Department of Science and Technology

INTRODUCTION AND RESEARCH OBJECTIVE

Section 11D³³ of the South African Income Tax Act No. 58 of 1962 (“the Income Tax Act”) has been a topical issue over the past few years. This is due to the potentially large tax incentive for research and development (“R&D”) that it affords the taxpayer, the number of amendments the section has undergone since it was introduced into legislation and its relevance to the general shift in business towards a more knowledge-based economy.

The changes that have occurred in the last few amendments to the Income Tax Act affect the operation of the tax incentive regime and shed clarity on issues where the intention of the legislation was not coming to pass in practice. The R&D Tax Incentive is supposed to support economic growth through innovation promotion and competitiveness enhancement (Department of Science and Technology, 2016b).

But have the objectives of the tax incentive regime been met and is there a greater output of R&D expenditure since its introduction?

There are reports which provide information regarding the R&D output in South Africa. These reports could be used to provide further insight into R&D.

The annual survey results from the National Survey of Research and Experimental Development, conducted on behalf of the Department of Science and Technology by the Centre for Science, Technology and Innovation Indicators at the Human Sciences Research Council provide some insight into whether the broader economic objectives of the legislation are being met.

The Tax Statistics, an annual joint publication between National Treasury and the South African Revenue Service (“SARS”), provides clarity on how companies’ profitability is forever changing (South African Revenue Service, 2016). This includes the statistics of the companies in the research and scientific institutes sector.

The annual Report to Parliament on the Performance of the Research and Development Tax Incentive Programme provides statistics on the uptake of the R&D tax incentive programme, tax revenue forgone, expenditure on R&D and the number of R&D personnel (Department of Science and Technology, 2015).

³³ All references in this paper to sections refer to sections of the South African Income Tax Act No. 58 of 1962 (as amended)

RESEARCH METHOD

A literature review was performed on section 11D of the Income Tax Act and its specific amendments. These amendments are then assessed as part of a doctrinal study to determine whether they are in line with the objectives of the legislation.

The success of any tax incentive is difficult to measure. The section 11D R&D Incentive was introduced into the Income Tax Act, on 2 November 2006.

The reports mentioned above were analysed to identify the changes in R&D output over time:

- The National Survey of Research and Experimental Development, from 2007 to 2014³⁴,
- The Tax Statistics, from 2007 to 2014³⁵, and
- The Reports to Parliament on the Performance of the Research and Development Tax Incentive Programme, from 2007 to 2015.

LIMITATIONS OF THE RESEARCH

This paper focuses on section 11D of the Income Tax Act (as amended). Its predecessor, section 11B was effective for years of assessment commencing on or after 1 January 2004 until it was repealed when section 11D replaced it on 2 November 2006. Section 11B applied to R&D performed by the taxpayer.

The R&D Tax Incentive measures analysed are focused on the increase in R&D, and not for what reason the incentive and expenditure is being used. The types of research output have not been specifically identified.

Had there been no tax incentive, businesses may not have incurred the expenditure on R&D. The paper does not investigate whether the business expenditure on R&D would have remained the same had there been no tax incentive. No research on this topic has been performed in South Africa to date (Köhler, Laredo, & Rammer, 2012).

³⁴ The latest R&D Survey, published on 24 May 2016.

³⁵ The 2015 Tax Statistics, published in November 2015, includes data up till the 2014 tax year.

THE LEGISLATION

Definition

The section 11D R&D Incentive was introduced into the Income Tax Act, in 2006 to replace the previous R&D rule that existed in terms of section 11B.

The Taxation Laws Amendment Acts promulgated in 2011 and 2013 contained several changes and enhancements to the legislation with respect to the R&D incentive that is available to taxpayers. A pre-approval process for R&D activities undertaken after 1 October 2012 was included. Prior to this date, only retrospective approval could be given.

One of the main objectives of the amendments to section 11D was to ensure that the definition of R&D is more robust, and requires the activities that qualify for the incentive to be innovative in nature (National Treasury, 2013). This was reflected in the various additions to the definition, as well as the stylistic changes and reorganisation of the subsections within section 11D, as detailed below.

The definition of R&D in section 11D(1) is three-fold, with the first part relating to discovery, creation or development, the second relating to improvements and the last part to medical research (creating or developing a product or conducting a clinical trial). The newer versions of the definition have introduced the requirement of “systematic investigative or systematic experimental activities of which the result is uncertain...” (National Treasury, 2013) to be applicable to both parts of the R&D definition as opposed to only the first part as it was in the 2011 amendment. The Taxation Laws Amendment Act (2013), promulgated on 12 December 2013, contained medical research subsections 11D(1)(d) and (e) which included the creating or developing of a multisource pharmaceutical product and conducting a clinical trial.

R&D activities should lead to the creation or development of an invention, functional design, computer program or knowledge essential to the use of these items. The latter activity has been clarified to exclude “creating or developing operating manuals or instruction manuals or documents of similar nature...” (National Treasury, 2013) to ensure that the outcome of the R&D is not only an integral part of the intellectual property that has been created, but also that such intellectual property should be intended for a more expansive use than the internal business operations of that entity or a connected person (Taxation Laws Amendment Act, 2013).

Both of the above amendments to the definition show an increased emphasis on innovation for the purpose of the incentive, as well a move towards R&D activities which have a scientific or technological focus.

Research and development exclusions

In previous amendments, expenditures which were disallowed for the purpose of the R&D deduction were detailed in section 11D(8). The revised definition of R&D in section 11D now encompass these exclusions within the *proviso*, with two minor changes. The exclusions now forming part of section 11D(1)'s *proviso* indicate that the expenditure should be viewed by the taxpayer as falling outside the scope of the definition of R&D as opposed to a prohibition of a deduction.

The section 11D(1) *proviso* (b) relating to the development of internal business processes has now been expanded to clarify that no deduction shall be allowed for such expenditure unless those business processes are intended for use by persons "who are not connected parties in relation to the person carrying on that research and development" (Taxation Laws Amendment Act, 2013). This further emphasises the intention of the legislature to incentivise the creation of intellectual property which is intended for sale to or use by third parties in relation to the taxpayer that carried out such R&D.

The other change relates to overhead and indirect costs which may be incurred in the process of R&D, such as financing and administrative costs, are not included in the *proviso*'s but disallowed in terms of section 11D(2)(b)(ii). Such expenditures do not form part of an activity that is outside the scope of the definition, but are instead a denial of the deduction as detailed in that subsection, and thus the movement.

Research and development deduction

Prior to the promulgation on 12 December 2013 of the Taxation Laws Amendment Act of 2013, section 11D(2) provided for an automatic deduction of 100% of qualifying expenditure that is incurred by the taxpayer in respect of R&D. This deduction could be claimed by such taxpayer without pre-approval provided that the expenditure is incurred solely and directly in respect of R&D activities which are undertaken in the Republic, are incurred in the production of income and in carrying on of any trade (National Treasury, 2012). Taxpayers could then potentially receive an additional deduction of 50% of the original qualifying expenditure if the expenditure is approved by the adjudication committee of the Department of Science and Technology, and the expenditure was incurred in respect of R&D activities that were undertaken on or after the date of receipt of the application for approval by the Department of Science and Technology (National Treasury, 2012).

An objective of the revised incentive regime, as stated in the Explanatory Memorandum on the Taxation Laws Amendment Bill (2013), is to align the previously separate 100% and 50% deductions. It was noted during the approval process that taxpayers had taken the view that expenditure which met the definition

of R&D in section 11D(1) would automatically receive the 50% additional deduction, while it was intended that the approval process for the uplift (additional deduction) should require further effort on the part of the taxpayer to ensure that the R&D activities which ultimately are subsidised by the government are those which would not have occurred in the ordinary course of business (National Treasury, 2013). To this end, there have been numerous changes to the wording of the subsections which deal with the available deductions under the incentive. Importantly, there is no longer an automatic deduction, and section 11D(2)(a) of the new amendment to the Income Tax Act requires that the taxpayer apply and receive approval from the Department of Science and Technology in order to be afforded a deduction of the full 150% of qualifying expenditure incurred on R&D activities which are undertaken after the date of successful application (National Treasury, 2013). The requirements that the expenditure be incurred directly and solely in respect of R&D activities undertaken in the Republic, in the production of income and in the carrying on of any trade have remained unchanged in section 11D(2)(a).

Disallowed deductions

The 2011 amendment to section 11D made no reference to items which are capital in nature and the potential deduction available in respect of such expenditures. As it stands, all expenditures on R&D activities are thus deductible provided that they meet the requirements within section 11D. While it is understandable that R&D activities which may culminate in a capitalised asset are deductible (since entities may undertake R&D for the purpose of developing an intangible asset that will be sold to, or the right of use granted to, third parties), this left open the possibility that capital assets such as plant, machinery and immovable property could qualify for the deduction under section 11D notwithstanding that they are provided for in sections 12C and 13(1) of the Income Tax Act.

While R&D expenditure that is of a capital nature is still deductible in terms of the 2013 Tax Laws Amendment Act, the proposed relief has dealt with the capital assets ambiguity in section 11D(2)(b) which states explicitly that no deduction is allowable under the section for “expenditure incurred in respect of immovable property, machinery, plant, implements, utensils or articles excluding any prototype or pilot plant...” (Taxation Laws Amendment Act, 2013). This section also disallows any deduction for financing, administration, compliance and similar costs. These costs were previously dealt with under the list of excluded items in section 11D(8), which have now been incorporated into the definition of R&D as discussed above.

Accelerated capital allowances under section 12C and section 13(1) of the Income Tax Act

Given that section 11D(2)(b) has disallowed the deduction of plant, machinery and immovable property and related expenditure, the taxpayer is only allowed to seek relief in the other sections of the Income Tax Act where accelerated capital allowances for these items are provided for, namely section 12C and section 13(1). There had been some ambiguity in the rates applicable in section 12C, but this was remedied in the 2013 amendment. Section 12C(1) *proviso* (d) provides for an accelerated allowance of 50%, 30% and 20% in three successive years.

Section 13(1)(b), (d), (dA) and (e), through the inclusion of the R&D option on top of a process of manufacture, permits the taxpayer an allowance on buildings used for R&D.

Third party funding of research and development activity

The requirements and allowable deductions in section 11D(4) for taxpayers who incur expenditure to fund R&D of another entity who undertakes such R&D on behalf of the entity that provides the funding has not changed, in effect, in the last two amendments to the section.

In the last three amendments of the legislation, the party who funds the R&D is entitled to the deduction allowable (i.e. 150%) provided that the R&D activities are approved by the Minister of Science and Technology, the expenditure is incurred by the party who receives the funding to undertake such R&D activities after the date of receipt of a successful application by the Department of Science and Technology, and to the extent that the party who carries out the R&D is exempt from normal tax under section 10(1)(cA) or is a company forming part of the same group of companies as defined in section 41, which has not claimed the deduction itself.

To the extent that the party that undertakes the R&D forms part of the same group of companies that funds such R&D, the deduction available to the funding company is limited to 150% of the expenditure actually incurred by the party undertaking the R&D, directly and solely for the purpose of R&D (National Treasury, 2012). This effectively eliminates the possibility of the funding party deducting any profit element which is charged to them by the party who carries out the R&D activities. This section 11D(2)(a) has been amended in the latest amendment of the legislation in order to align all deductions and allowances with the 150%. The previous percentage under section 11D(3), which has since been deleted, was 50%.

Given that section 11D(2) grants the taxpayer who undertakes R&D the potential deduction under the incentive, and section 11D(4) grants the deduction to the party

who funds the R&D in the event that it is carried out by another party on behalf of the funder, section 11D(6) has clarified which party shall be considered the party to undertake or carry out the R&D activities.

A person who is carrying on R&D is the person who has control over the R&D process by virtue of possessing the ability to determine or alter the methodology in terms of which the R&D is carried out (Köhler et al., 2012).

The section 11D(6)(b) amendment has broadened the scope of the above by allowing the Minister of Science and Technology to designate certain categories of R&D by way of government regulations which will be published in the Government Gazette (Taxation Laws Amendment Act, 2013). While the above rule regarding the research methodology will provide sufficient guidance in most circumstances, there are certain instances where complexities arise, and it is submitted that it is for this reason that the legislature has afforded the Minister of Science and Technology this outlet (Department of Science and Technology, 2016b).

The amendment to section 11D(6)(b) has also made it clear that while the incentive is only available for R&D activity undertaken within South Africa, the activities that are taking place within the Republic must have some level of significance to the R&D endeavour as a whole (National Treasury, 2013). This speaks to the overall intention of the taxation legislation, noting that it is intended to encourage local skills development, and this can only occur if some significant activity occurs in South Africa (National Treasury, 2013).

There may be some exceptions to the above in the pharmaceuticals and Information and Communications Technology (ICT) sectors given the nature of the operations of these sectors (National Treasury, 2013). This further highlights the necessity to amend the section to allow the Minister of Science and Technology the power to prescribe criteria by which one can evaluate which types of R&D will be eligible for the incentive. It is expected that more guidance will be provided in the regulations regarding the pharmaceuticals and ICT sector specifically (National Treasury, 2013).

Government and quasi-governmental funding

In terms of previous legislation, where an amount was received by way of a government grant, such amount was not eligible for a deduction under the additional uplift incentive (the extra 50%) provided for in section 11D. This is intended to prevent double dipping by virtue of the grant being exempt in the hands of the recipient while still allowing an additional deduction to the taxpayer (National Treasury, 2012).

Given that the purpose of the introduction of the incentive regime was to encourage private sector funding of R&D activity, the application of this limitation in respect of government grants was thought to be too narrow (National Treasury, 2013). The 2013 amendment thus broadened this provision to be applicable to not only exempt government grants, but also funding received from any quasi-governmental agency such as a public entity which is listed under schedule 2 or 3 of the Public Finance Management Act No. 1 of 1999 or a municipality. Under the current legislation, which has not changed for section 11D(7), should funding be received from any of the above entities, the 150% deduction shall not be available to the taxpayer to the extent of such funding.

Withdrawal of approval

Under previous legislation, section 11D(10) allowed for the withdrawal of the approval that has been granted in terms of section 11D if the taxpayer had failed to disclose any material facts that may have had an effect on the approval process if they had been known at the time it was granted, or if the taxpayer should fail to submit any of the reports that are required under section 11D.

The 2013 amendment extended the criteria for withdrawal of approval to include the following circumstances: “the taxpayer on that R&D is guilty of fraud, or misrepresentation or non-disclosure of material facts which would have had the effect that approval under section 11D(9) would not have been granted” (Taxation Laws Amendment Act, 2013).

Administrative provisions

There have been various changes to the administrative subsections of section 11D. Section 11D(9) deals with the approval process of the R&D Incentive, and has been amended to allow a person who has been appointed by the Minister of Science and Technology to approve the applications as opposed to this being the responsibility of the Minister alone. Previously, the Minister of Science and Technology would consider the innovative nature of the R&D, the extent to which it will require specialised skills and other criteria which is prescribed by them in making the decisions regarding approval. These aspects have been encompassed within a more robust definition of R&D and the Minister of Science and Technology (or appointed individual) must consider whether the R&D complies with the criteria that is set out in the definition of R&D under section 11D(1), or alternatively the criteria which has been prescribed by the Minister of Finance in consultation with the Minister of Science and Technology.

Section 11D(13) requires that the taxpayer who has been granted approval report to the committee (as required by section 11D(11)) on an annual basis, within 12 months of the end of the year of assessment of the taxpayer, to present the progress of the R&D Incentive to date. In addition to this requirement, section 11D(13) requires that the approval report to the committee should also detail “the extent to which that research and development requires specialised skills” (Taxation Laws Amendment Act, 2013). This requirement was previously consideration for the granting of approval, and again speaks to the intention of the legislation to enhance skills development in the Republic (National Treasury, 2012).

Section 11D(14) has been amended to allow the Commissioner for SARS (Commissioner) to disclose to the Minister of Science and Technology any information in relation to the R&D activities of a taxpayer, if that information is material with regard to either the granting of approval for the tax incentive or the withdrawal of approval by the Minister.

Section 11D(16) has been amended to allow a person appointed by the Minister of Science and Technology (in addition to the Minister) to provide written reasons for the approval or withdrawal of approval, as well as to service the Commissioner with information regarding the granting of approval, the withdrawal of approval and the date on which such events take effect.

The other changes that have been made to section 11D are stylistic and grammatical in nature.

THE OBJECTIVES OF SECTION 11D

Through an analysis of the amendments to taxation legislation as stated in Explanatory Memorandums on the Taxation Laws Amendment Bills, an assessment can be made as to whether the theoretical objectives of the R&D Incentive have been met. The improvement in R&D in the South African economy must then be measured and an assessment of whether the overall objective of the introduction of section 11D into legislation has been met can be made.

The overriding objectives of section 11D are higher domestic productivity, economic growth, increased employment levels, increased taxable income and better skills development. The Department of Science and Technology introduced the 150% deduction incentive to motivate R&D in the business sector to help promote national competitiveness (Department of Arts, Culture, Science and Technology, 2002).

While all of these still hold, the Explanatory Memorandum on the Taxation Laws Amendment Bill (2013) states the following:

“The existing research and development tax incentive regime has been revised to achieve the following main objectives:

1. *To align the 100% and the 50% deductions.
The additional uplift was intended to force the taxpayer to put in extra effort to obtain the additional allowance through an application process, and not assume an automatic uplift if the definition was met. Since this was not occurring as intended, the application must now be for the full 150%.*
2. *To ensure a more robust definition of research and development, requiring that research and development for the purpose of the incentive will be innovative in nature.
This was necessary as the prior policy of the 50% uplift potentially allowed for the claiming of expenditure which was never intended to fall within the ambit of the section.*
3. *To simplify and streamline the legislation for ease of use.”*

The first stated objective has been met. The change in the wording of the legislation will ensure that it is achieved by forcing taxpayers to apply for the full 150% deduction. The revision of the definitions in section 11D(1) as well as the other changes previously discussed have the potential to ensure that R&D activities that are undertaken are more innovative in nature. However, given this amendment's recent date of promulgation (12 December 2013) and the lack of research survey data, there is no evidence on which to base an assessment of this issue. Therefore, a limited assessment of whether or not the latest amendment has been simplified and streamlined must be performed.

There are recurring issues in the previous legislation that were considered pitfalls of section 11D from the perspective of the taxpayer. These include the following:

- The interpretation and implementation of section 11D requires extensive knowledge of not only tax law but also intellectual property law (Strauss, 2011).
- There is contention with regards to the application of the section to the development of computer programmes. This is related to the fact that SARS is of the view that computer programmes which automate internal business processes or create management efficiencies do not qualify for the deduction even if such programmes are for sale to third parties. This excludes most software development companies from the claiming the deduction (Strauss, 2011).
- Interpretation Note 50, released by SARS in 2009, on the topic of R&D (and which was needed by taxpayers due to the difficulty in interpretation and implementation as mentioned above) has been highly criticised (Strauss, 2011). It has been said that it is at odds with the Frascati Manual issued by

the Organisation for Economic Co-operation and Development (OECD), and widely accepted as best practice on the subject. The interpretation note has also been criticised for misinterpretations of well-established legal principles, particularly with regard to the concept of “novelty” (Strauss, 2011). The first issue has been specifically addressed in the new taxation amendment, and given the changes to the definitions and arrangement of the section it is possible that the interpretation of the section will be less onerous. The definitions and details pertaining to software development have also been updated in the new amendment, although some of the issues regarding internal business processes are likely to remain. Finally, there has not been an updated interpretation note on R&D, but the concept of novelty has been removed from the latest amendment to the section.

MEASURING RESEARCH AND DEVELOPMENT

Prior to the introduction of section 11D, the applicable legislation in respect of R&D was contained within section 11B, which has since been repealed. The initial draft of the original section 11D was proposed in October 2006, enacted in February 2007, and came into operation on 2 November 2006. As discussed above, it has been amended numerous times since the date it was passed into law, with the first amendment occurring in February 2007. This is expected to continue until the objectives of the section have been met (Strauss, 2011). The intentions and objectives of the introduction of the section can be assessed through review of the National Surveys of Research and Experimental Development, published by the Department of Science and Technology.

The overall objective of the introduction of section 11D

It is recognised that innovation and technological advancement are key factors in the pursuit of higher productivity within a country. South Africa is no different, and with enhanced productivity, there is the potential for higher economic growth and improved competitiveness on an international level (National Treasury, 2013). While many European and Asian countries have established themselves as specialists in various scientific and technological fields, South Africa has had to pay royalties to these foreign nations as a result of the lack of innovation and advancement on its own shores (Williams, 2012). These are contributing factors which have caused National Treasury and SARS to incentivise investment in R&D through an attractive tax regime for qualifying expenditure.

In addition to the tax incentives provided by the government for R&D, there are currently a number of direct subsidies which will aid this cause. However, it is noted that the main objective of the current tax regime is to encourage private sector funding and expenditure on R&D (National Treasury, 2012). With this private sector

undertaking, South Africa hopes to encourage spending on R&D that would not have otherwise occurred in the normal course of business (National Treasury, 2013). Thus the effect of the incentive on the growth of R&D in the country can be measured by enhanced domestic productivity, economic growth, job creation, skills development and taxable income (National Treasury, 2013).

Section 11D(17) states that “The Minister of Science and Technology must annually submit a report to Parliament advising Parliament of the direct benefits of R&D in terms of economic growth, employment and other broader government objectives and the aggregate expenditure in respect of such activities without disclosing the identity of any person”. It is these reports by the Department of Science and Technology that will be analysed in determining the success of the incentive since its introduction in 2007.

According to the reports issued by the Department of Science and Technology, the National Survey of Research and Experimental Development is undertaken annually, and provides information on the sources of R&D funding, the amount of expenditure on R&D in institutional sectors as well as information regarding the human capital that is involved in these R&D activities (Department of Science and Technology, 2013). The survey is carried out in terms of the principles which have been set out in the Frascati Manual Guidelines (Organisation for Economic Co-operation and Development, 2002), which was developed by the OECD and is widely considered best practice on the subject matter (Department of Science and Technology, 2011). The primary data in the survey is sourced from various public and private sector organisations. In the public sector, data is collected from universities, science research councils as well as department based research institutes. Public sector institutions are normally not taxpaying entities anyway, so would not qualify for section 11D. In the private sector, the primary data providers are both non-profit organisations and profit making firms (Department of Science and Technology, 2008).

One of the key indicators that is calculated in the R&D report is the gross expenditure on R&D (GERD), and GERD as a percentage of Gross Domestic Product (GDP). Per the R&D report, the target of GERD:GDP reaching 1% by 2008 was set, however a new target of 1.4% by 2015 was set (Department of Science and Technology, 2008), and the new legislature intended for the amended R&D Incentive to help attain this goal.

Section 11D came into operation at the end of the 2007 fiscal year. While the amendment would have been known prior to this, it is submitted that the effect of the incentive would have had a minimal impact in 2007 and that growth in R&D from 2008 must be assessed and compared to the results of the latest available survey, being 2013/2014.

The National Survey of Research and Experimental Development results

Key indicators

TABLE 1: KEY R&D INDICATORS, SOUTH AFRICA, 2013/14 WITH COMPARATIVE FIGURES FOR 2007/08

KEY INDICATOR	VALUE	
	2007/08	2013/14
Gross domestic expenditure on R&D (GERD) (R million)	18 624	25 661
Gross domestic product (GDP) at current prices (R million)	2 002 580	3 534 326
GERD as a percentage of GDP (%)	0.93	0.73
Total R&D personnel (FTE)*	31 352	37 957
Total researchers (FTE)#	19 320	23 346
Total R&D personnel (FTE) per 1 000 in total employment	2.4	2.5
Total researchers (FTE) per 1 000 in total employment	1.5	1.6
Total R&D personnel (headcount)	59 344	68 838
Total researchers (headcount)	40 084	45 935

* FTE = Full-time equivalent

Following OECD practice, doctoral students and post-doctoral fellows are included as researchers

Data source: South African National Survey of Research and Experimental Development, 2007/08, and South African National Survey of Research and Experimental Development Statistical Report, 2013/14

GERD

TABLE 2: GERD IN CONSTANT 2010 RAND VALUES

Year	Amount (R million)
2007/08	23 174
2008/09	24 057
2009/10	22 286
2010/11	20 254
2011/12	20 824
2012/13	21 213
2013/14	21 515

Data source: South African National Survey of Research and Experimental Development Statistical Report, 2013/14

GERD amounted to R25.661 billion in 2013/14. This represents an increase of 37.78% from R18.624 billion in 2007/08. R&D expenditure has been increasing nominally between 2001/02 and 2012/13 (Department of Science and Technology, 2013). However, as can be seen in Table 2, at a constant 2010 Rand value, GERD has decreased slightly (Department of Science and Technology, 2016a). Statistics South Africa (2014) revised and adjusted the GDP figures to 2010 Rand values. GERD has yet to reach its highest value, recorded in 2008/09 (Department of Science and Technology, 2016a).

GERD as a percentage of GDP

For an international comparison, GERD expressed as a percentage of GDP can be used to compare countries' R&D. GERD as a percentage of GDP in South Africa was 0.73% in 2013/14. This ratio increased from 0.60% in 1997/98 and peaked at 0.95% in 2006/07 (Department of Science and Technology, 2011). However, there is no indication as to whether this movement was due to any tax incentives. GDP has increased at a higher rate than the nominal value of GERD until 2010/11, indicated by the decrease in GERD as a percentage of GDP. The rate has stayed relatively constant since 2010/11.

This indicates that the incentive objective did not come to pass in the 2007/08 period, which is in line with the expectation that a change in legislation will take time to filter to the economy. In light of the positive economic results discussed above, Mrs Naledi Pandor (the Minister of Science and Technology at the time) stated the following: "It does appear, from the R&D survey results, that both the investment in R&D and the growth in the number of researchers lagged these important developments. This observation requires careful analysis to determine appropriate policy responses in the future" (Department of Science and Technology, 2009). It is possible that these results were the driving force behind the numerous amendments that have followed since the inception of the tax incentive regime.

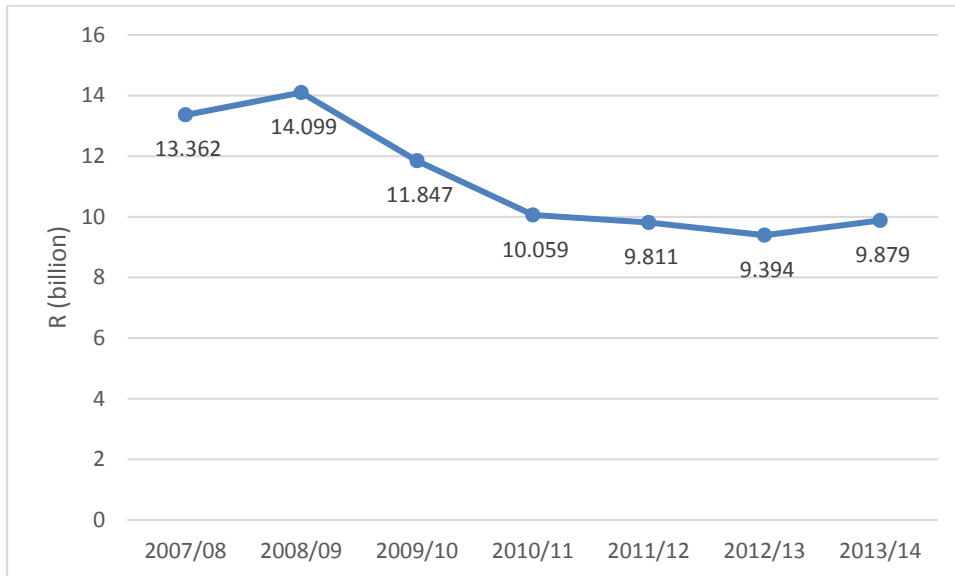
GERD by sector

The National Survey of Research and Experimental Development reports GERD by five sectors: Government, Science Councils, Higher Education, Business and Not-for-profit (Department of Science and Technology, 2016a). The business sector is the only sector that would be affected by the R&D tax incentive.

Business expenditure on R&D amounted to R11.783 billion in 2013/14, equivalent to 45.9% of GERD. This is a 10% nominal increase from the R10.739 billion recorded

in 2007/08. This sector has remained the largest contributor to R&D expenditure in South Africa, in both nominal and constant 2010 Rand value terms.

FIGURE 1: BUSINESS EXPENDITURE ON R&D (R BILLION), SOUTH AFRICA, 2007/08 TO 2013/14 IN CONSTANT 2010 RAND VALUES



Data source: *South African National Survey of Research and Experimental Development, 2007/08 to 2013/14*

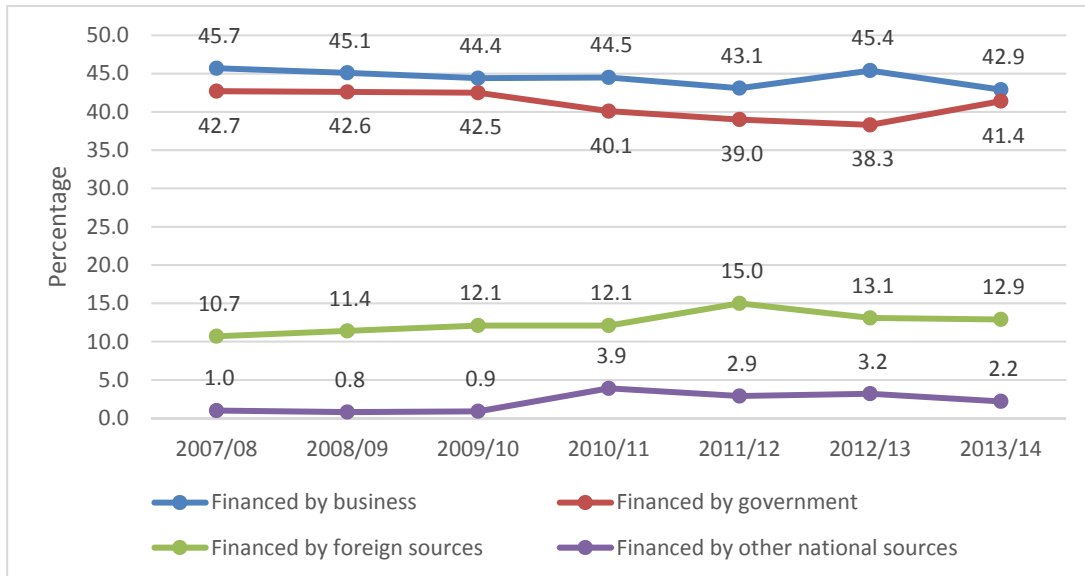
Figure 1 illustrates that in constant 2010 Rand value, Business expenditure on R&D has decreased 26% from R13.362 billion in 2007/08 to R9.879 billion in 2013/14.

The R&D Tax Incentive is supposed to change the behaviour of taxpayers, by stimulating additional investment over and above had there been no incentive (Guellec & De La Potterie, 2003). To the authors own knowledge, no published research has been performed in South Africa to determine whether the business expenditure on R&D would have remained the same had there been no tax incentive. International literature (Köhler et al., 2012) has indicated opportunity losses when government does not support private sector R&D, whereby short term tax revenue forgone is more than offset by long term economic benefits and efficiencies.

GERD by sources of funds

R&D expenditure in South Africa is funded by business, government, foreign sources and other uncategorised South African sources. Government-funded R&D included all public funding for R&D received by the higher education, science councils, business and government departments.

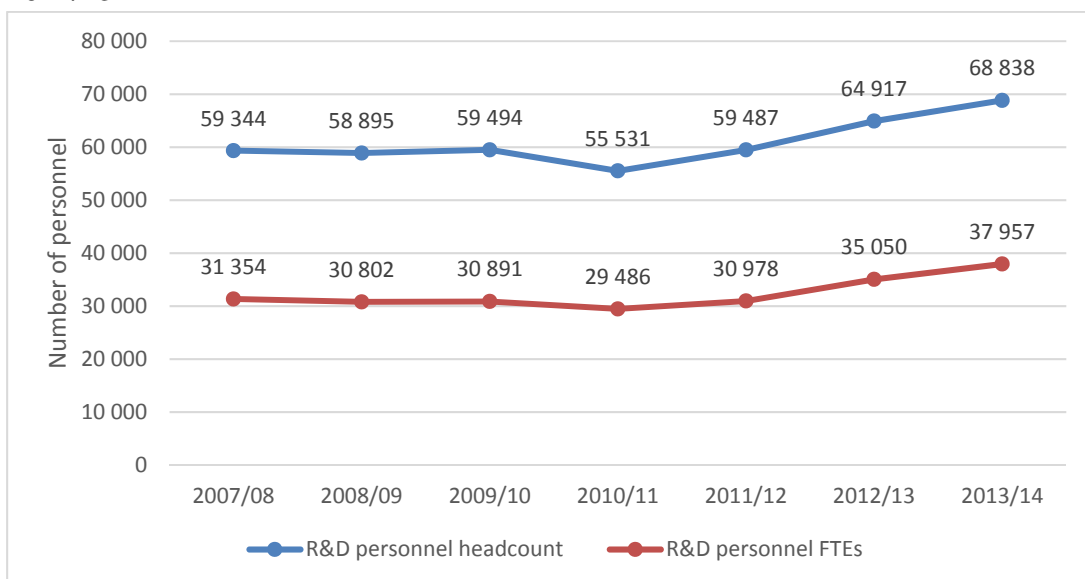
FIGURE 2: GERD BY SOURCE OF FUNDS (PERCENTAGE), SOUTH AFRICA, 2007/08 TO 2013/14



Data source: South African National Survey of Research and Experimental Development, 2007/08 and 2012/13

Government and business enterprises have consistently funded the largest proportion of GERD in South Africa. Government funding has exceeded all other enterprises, local and foreign, including business funding since 2007/08. The proportion of R&D funds from foreign sources and other national sources increased in 2013/14 from 2007/08, while the proportion of funds from government and business decreased. **Research and development personnel**

FIGURE 3: R&D PERSONNEL (HEADCOUNT AND FTEs), SOUTH AFRICA 2007/08 TO 2012/13



Data source: South African National Survey of Research and Experimental Development, 2007/08 and 2012/13

R&D personnel headcount totalled 68 838 in 2013/14, which is an increase of 9 494 since 2007/08. Note that as per OECD practice, doctoral students and post-doctoral fellows are counted as researchers. R&D personnel (Full-time equivalents) have also increased.

The Tax Statistics

The General Assembly of the United Nations adopted a resolution to endorse the Fundamental Principles of Official Statistics on 29 January 2014 (United Nations, 2014). Government agencies use these principles as best practice for the publishing (and generation) of statistics. SARS and National Treasury jointly publish tax statistics annually, generated from SARS' registers of taxpayers and from tax returns (South African Revenue Service, 2016).

TABLE 3: ASSESSED INDIVIDUAL TAXPAYERS WITH BUSINESS INCOME IN THE RESEARCH AND SCIENTIFIC INSTITUTES SECTOR, 2007 – 2014

TAX YEAR	Number of taxpayers	Taxable income (R million)	Tax assessed (R million)
2007 [97.1% assessed]	13 796	– *	572
2008 [95.9% assessed]	4 098	– *	176
2009 [94.5% assessed]	4 463	899	196
2010 [94.7% assessed]	1 542	407	116
2011 [93.3% assessed]	1 431	363	110
2012 [90.8% assessed]	1 393	423	125
2013 [85.2% assessed]	1 329	474	130
2014 [74.9% assessed]	1 379	564	145

* No data available

Data source: Tax Statistics, 2008 to 2015

The number of individual taxpayers with business income in the Research and Scientific Institutes sector (table 3), appears to have decreased. However, the large decrease in taxpayers from 2007 to 2008 and again from 2009 to 2010 is due to a change in classification of the composition of individuals in the Research and Scientific Institutes sector, and not necessarily as a result of a decrease in the number of taxpayers. No adjusted data was available for those years.

The comparable data from 2010 indicates that there was a slight decrease in 2011, but that the numbers have been constant since then. Additionally, the assessed tax, while increasing slightly, does not indicate a significant increase.

TABLE 4: ASSESSED COMPANIES IN THE RESEARCH AND SCIENTIFIC INSTITUTES SECTOR, 2007 – 2014

TAX YEAR	Number of taxpayers	Taxable income (R million)	Tax assessed (R million)
2007 [104.3% assessed tax]*	1 195	-318	89
2008 [102.2% assessed tax]	1 472	-289	103
2009 [98.7% assessed tax]	1 666	-638	126
2010 [99.2% assessed tax]	1 804	-1 088	119
2011 [100.5% assessed tax]	1 751	-820	146
2012 [99.5% assessed tax]	1 466	-748	189
2013 [93.3% assessed tax]	1 057	-619	214
2014 [44.5% assessed tax]	759	62	158

* as a percentage of provisional tax

Data source: Tax Statistics, 2008 to 2015

The number of companies in the Research and Scientific Institutes sector increased until 2010, and thereafter decreased. Once all 2014 returns have been assessed, the number may reach 2012 levels.

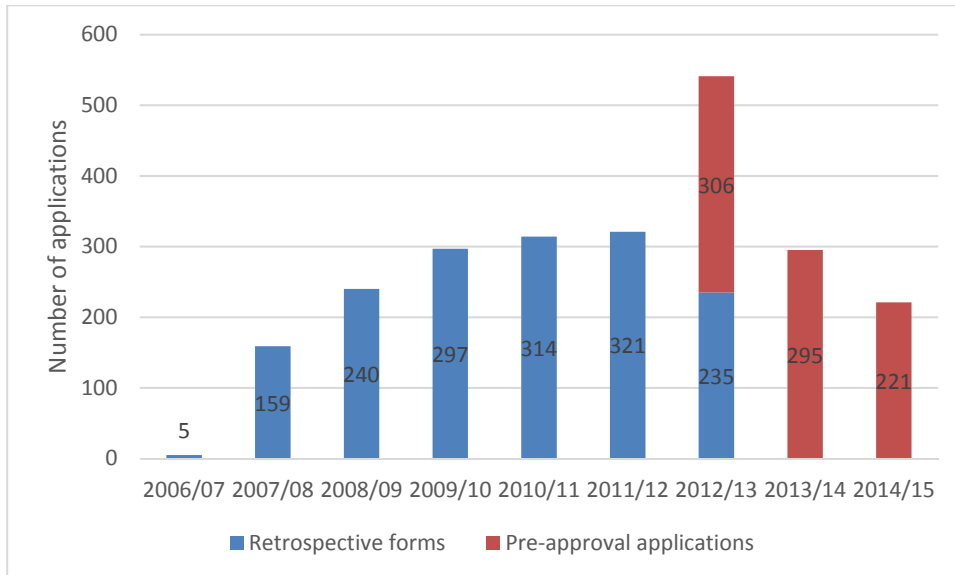
There has been a steady increase in the tax assessed from 2007 (with a small decrease in 2010) and this is expected to continue in 2014 after all returns are assessed.

Reports to Parliament on the Performance of the Research and Development Tax Incentive Programme

The reports follow the activities of the R&D Tax Incentive on an annual basis, using certain identified performance indicators, including uptake, participating company profiles, tax revenue forgone, amounts of R&D expenditure incurred and budgeted and estimated companies' results achieved from supported R&D (Department of Science and Technology, 2015).

Number of applications

FIGURE 4: NUMBER OF RETROSPECTIVE FORMS AND PRE-APPROVAL APPLICATIONS RECEIVED BY THE DST, 2006/07 TO 2014/15



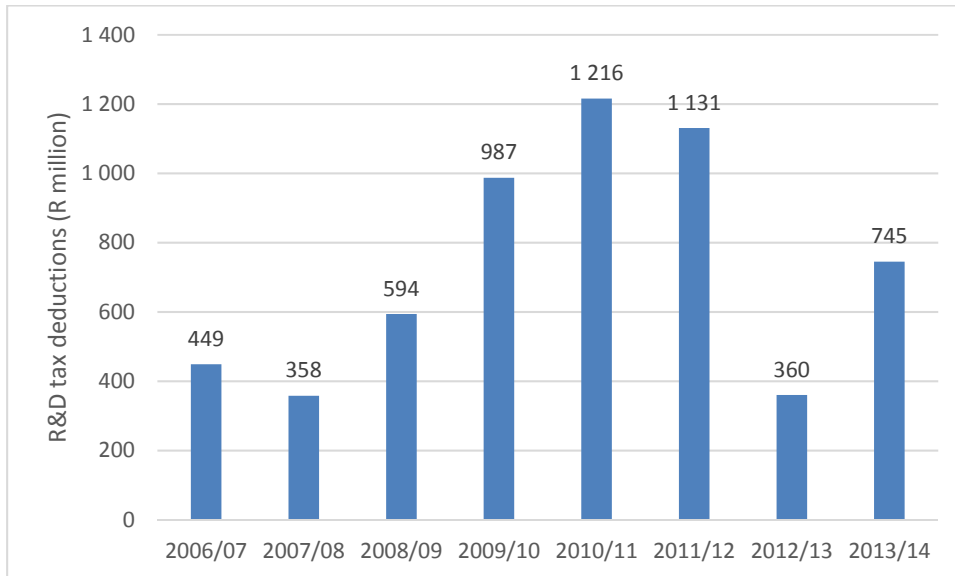
Data source: Report to Parliament on the Performance of the Research and Development Tax Incentive Programme, 2007 to 2016

Figure 4 illustrates an increase in the number of retrospective forms received by the DST for the R&D Tax Incentive from 2006/07 to 2011/12. In 2012/13, the DST received both retrospective forms and applications for pre-approval, following the change in the approval process. Thereafter, there is a decline in the number of applications.

However, this decline could be attributed to the change in the administrative procedure. After the change in the approval process, companies could submit applications with projects spanning multiple years, rather than an application each year (Department of Science and Technology, 2016b).

Tax Revenue Foregone

FIGURE 5: TAX REVENUE FOREGONE 2006/07 TO 2013/14



Data source: South African National Treasury Budget Review, 2007 to 2016

National Treasury has estimated that roughly R5.5 billion in tax revenue has been foregone through the section 11D R&D Tax Incentive. Figure 5 indicates the revenue foregone per annum. Note the large decrease of 70% in 2012/13, and 38% in 2013/14 compared to 2010/11. This was due to the change in the application process for the allowable deduction, where taxpayers needed to have their expenditure pre-approved. There were administrative delays and backlogs that developed (National Treasury, 2016).

ASSESSMENT OF FINDINGS

This paper defines a successful R&D tax incentive as an incentive that increases:

1. R&D expenditure,
2. The number of research personnel,
3. The number of taxpayers, and their taxable income in the Research and Scientific Institutes sector,
4. The volume of incentives granted by SARS, and/or
5. The tax revenue foregone.

There are various factors which impede the ability to draw conclusive findings based on the above data. It is difficult to determine the period it takes for the various sectors within the country to begin making use of a tax incentive once it becomes available. Different implementation times amongst sectors may skew conclusions.

Given that the period under review was one which experienced an economic recession, and the trends seen indicate fluctuation, albeit on an upward trend,

making it difficult to determine the extent to which the results can be attributed to the tax incentive regime as opposed to other external factors.

Notwithstanding this, and bearing in mind the original objective of higher levels of R&D which lead to innovation that yields positive externalities for the economy of the country, there are trends that can be noted.

TABLE 5: SUMMARY OF FACTORS INFLUENCING WHETHER THE R&D TAX INCENTIVE HAS BEEN EFFECTIVE

Factor	Effect
GERD	Decreased since 2007/08, but has been increasing in constant 2010 Rand values since 2010.
GERD as a percentage of GDP	Decreased since 2006/07.
Business Expenditure on R&D	Decreased since 2007/08, although a slight improvement in 2013/14.
GERD by sources of funds	Government is funding more GERD, and business less than past years.
Personnel	Both headcounts and FTEs have increased.
Companies in the Research and Scientific Institutes sector	The number of companies has steadily decreased, although the tax assessed has increased.
Applications for s11D	Increased until 2012/13, then decreased (but due to change in admin process).
Tax revenue forgone	Increased until 2010, thereafter decreasing.

Source: Authors' own construct

The decrease in business expenditure on R&D, coupled with the increase in GERD, indicates that the South African economy is not growing in terms of R&D. However, once the backlog of applications for section 11D have been processed, this may filter into business expenditure.

The South African government was the largest funder of R&D expenditure since the 2007/08 fiscal year, with the business sector following. While the business sector made a small contribution to funding in the higher education sector, it showed a decrease in funding provided to the science councils (Department of Science and Technology, 2013). The business sector displayed steady positive growth in the funding within its own sector. Given that an objective of the tax incentive was to increase private sector funding of R&D activity, this trend indicates a positive result from the perspective of the objectives set out by the legislature.

The increase in personnel is a clear indication of an increase in research, but contradicts the decrease in business expenditure. The authors could not find any literature providing a reason for this incongruity.

While the number of companies in the Research and Scientific Institutes sector has decreased (with tax assessed increasing), these companies are not all the companies performing R&D in the economy. The increase of tax assessed is promising, and hopefully extrapolates into the whole population, even though business expenditure on R&D decreased.

The applications' decreasing as much as they have is mainly due to a change in the administration process. Taxpayers were uncertain of how to apply for R&D tax incentives and whether they would receive approval. However, the change in the process from a retrospective application to a pre-approval was more taxing administratively and resulted in a large backlog of claims (Department of Science and Technology, 2015).

The Department of Science and Technology (2016b) suggests simplifying the administrative process through a revised application form, improved information, assisting all stakeholders in understanding the incentive and helping them throughout the process. Additionally, a hybrid model of approval, once demonstrable R&D has been performed, may be another option.

The decrease in tax revenue forgone since 2012 is affirmed by the backlog and additional administration required by the approval process.

Overall, there appears to be a decrease in R&D rather than an increase. This goes against the objective of a R&D Tax Incentive. As stated previously, no research on whether R&D would have remained the same had there been no tax incentive has been performed in South Africa to date (Köhler, Laredo, & Rammer, 2012). However, it may be prudent to recommend changes to the R&D Tax Incentive. These changes could include international considerations and expanding the allowable R&D, both in terms of scope and attraction.

CONCLUSION

Section 11D of the Income Tax Act has undergone multiple changes since it was introduced into legislation in 2006. It can be seen that most of the changes were to ensure that the original intention of the legislature is effected, and many of the new additions to the section have been promulgated with the view to placing an emphasis on R&D that is scientific and technological in nature.

In looking at the objective of the latest taxation laws amendment, it was noted that conclusive findings cannot be drawn based on the fact that it is not yet in operation.

Some of the issues that plagued the previous versions of the section have been addressed in the new amendment, while certain others are likely to remain contentious.

Based on the results obtained from the National Survey of Research and Experimental Development, the Tax Statistics and the Reports to Parliament on the Performance of the Research and Development Tax Incentive Programme, there is evidence of a marginal decrease in R&D in South Africa. However, had the R&D Tax Incentive not been in existence, it is possible that there would be significantly less expenditure on R&D.

Improvements to both the legislation and administrative process would help increase the level of R&D in South Africa.

References

- Department of Arts Culture Science and Technology. (2002). *National Research and Development Strategy*. Pretoria.
- Department of Science and Technology. (2008). *National Survey of Research and Experimental Development, High-level key results, 2006/07*. Pretoria.
- Department of Science and Technology. (2009). *National Survey of Research and Experimental Development, High-level key results, 2007/08*. Pretoria.
- Department of Science and Technology. (2011). *National Survey of Research and Experimental Development, 2007/08*. Pretoria.
- Department of Science and Technology. (2013). *National Survey of Research and Experimental Development, High-level key results, 2009/10*. Pretoria.
- Department of Science and Technology. (2015). *Performance of the Research and Development Tax Incentive Programme, Report to Parliament 2013/14*. Pretoria. Retrieved from <http://www.dst.gov.za/index.php/services/41-rad-tax-incentives-programme/1288-reports-to-parliament-20132014>
- Department of Science and Technology. (2016a). *National Survey of Research and Experimental Development, Statistical Report, 2013/14*. Pretoria.
- Department of Science and Technology. (2016b). *Report of the Joint Government Industry Task Team on the Research and Development Tax Incentive*. Pretoria. Retrieved from <http://www.dst.gov.za/index.php/services/the-rad-tax-incentives-programme>
- Guellec, D., & De La Potterie, B. V. P. (2003). The Impact of Public R&D

Expenditure on Business R&D. *Economics of Innovation and New Technology*, 12(3), 225–243.

Köhler, C., Laredo, P., & Rammer, C. (2012). *The Impact and Effectiveness of Fiscal Incentives for R&D. NESTA Compendium of Evidence on Innovation Policy Intervention*. Retrieved from <http://www.innovation-policy.net/compendium/>

National Treasury. (2012). *Explanatory Memorandum on the Taxation Laws Amendment Bill, 2011*.

National Treasury. (2013). *Explanatory Memorandum on the Taxation Laws Amendment Bill, 2013*.

National Treasury. (2016). *Budget Review 2016*. Pretoria. Retrieved from [http://www.treasury.gov.za/documents/national budget/2016/review/default.aspx](http://www.treasury.gov.za/documents/national%20budget/2016/review/default.aspx)

Organisation for Economic Co-operation and Development. (2002). *Frascati Manual: Proposed Standard Practice for Surveys on Research and Experimental Development. The Measurement of Scientific and Technological Activities* (6th ed.). France. <http://doi.org/10.1787/9789264199040-en>

Republic of South Africa. Taxation Laws Amendment Act No. 31 of 2013, Government Gazette (2013). Republic of South Africa. <http://doi.org/102GOU/B>

South African Revenue Service. (2016). *Tax Statistics 2015*. Pretoria.

Statistics South Africa. (2014). *Gross Domestic Product*. Pretoria.

Strauss, C. (2011). *An Analysis of Sections 11D(1)(a) and 11D(5)(b) of the Income Tax Act No. 58 of 1962 as Amended*. University of Stellenbosch.

United Nations. (2014). *General Assembly Resolution A/RES/68/261*. Retrieved from <http://unstats.un.org/unsd/dnss/gp/fundprinciples.aspx>

Williams, R. (2012). Research and development expenditure - the 150% deduction. *Pwc Synopsis - Tax Today*, (February 2012). Retrieved from <https://www.pwc.co.za/en/assets/pdf/synopsis-february-2012.pdf>