Report No: AUS12595

South Africa

Country-level fiscal policy notes

Sector Study of Effective Tax Burden & Effectiveness of Investment Incentives in South Africa-Part I

June 2015

AFCS1

AFRICA

Document of the World Bank

SUMMARY OF ACRONYMS

AETR   Average Effective Tax Rate

GDP   Gross Domestic Product

ETR   Effective Tax Rate

DTI   Department of Trade and Industry

FDI   Foreign Direct Investment

IDZ   Industrial Development Zones

IFC   International Finance Corporation

IMF   International Monetary Fund

CIT   Corporate Income Tax

VAT   Value-Added Tax

METR   Marginal Effective Tax Rate

PIT   Personal Income Tax

SARS   South African Revenue Service

SEZ   Special Economic Zone

SME   Small and Medium Enterprises

WBG   World Bank Group

TABLE OF CONTENTS

Tables

Figures

Boxes

Acknowledgments

**Sector Study of Effective Tax Burden
and Effectiveness of Investment Incentives in
South Africa-Part 1**

I.   EXECUTIVE SUMMARY

1.   This report tries to address the question whether the tax system—especially tax incentives—are effective in reducing the burden on investment and if these lower burdens are translating to more investments. Part 1 of the report, presented here, shows how the tax system impacts Marginal Effective Tax Rates (METRs) on capital investment. It calculates the METR on capital and labor for the major sectors of the South African economy. The second part of the report, which will be issued separately in the coming months, aims to use firm level information to calculate the Average Effective Tax Rates[1] of the major sectors and the elasticity of investment to the user cost of capital which captures the burden of the tax and non-tax parameters on the cost of investment.[2]

2.   This report updates the 2006 FIAS study of the Marginal Effective Tax Rates (METR) for the principle sectors of the South African economy called 'South Africa - Sector Study of Effective Tax Burden.'[3] The METR is a measure of the burden of tax on the marginal investment for a profit maximizing firm and determines the scale of a project: a higher METR means small size projects and fewer investments. As a result, the METR is an important parameter to keep in mind when designing tax policy. This report also augments the quantitative METR estimates by sector with a qualitative analysis based on discussions with investors in key sectors on the tax and non-tax barriers to investments. It is hoped that this report will help the Davis Tax Commission to shed light on the impact of the tax system on investments in South Africa.

3.   This report improves on the 2006 methodology along several dimensions. We use South Africa specific parameters in the METR model, mainly with respect to the actual asset structure and leverage ratios of each sector. We also cover a wider range of sectors. Using South African specific parameters brings a richer and more accurate set of information of the various assets, their economic life, and their different composition across sectors to the METR calculations. In addition, this study adds calculations of the METR on labor which allows us to provide a more comprehensive assessment of the impact of the total tax system on capital and labor used by firms. At the request of the Davis Tax Commission the methodologies and tools developed by this study have been passed onto South African policy makers through a series of workshops which will allow them to become integrated into the regular policy making process of the government.

The main conclusion arising from the report is that:

---

[1] The AETR measures the average tax burden on overall investment and is important for locational decisions of firms and hence an important determinant for FDI.

[2] The second part of this study uses firm level data to see how firms are responding to lower burdens on investments as measured by their user cost of capital.

[3] Foreign Investment Advisory Services (FIAS) a joint service of the World Bank and the International Finance Corporation (IFC) conducted a study of marginal effective tax rates in five key sectors of the South African economy.

4.   South Africa's METR is internationally competitive. For manufacturing it ranks 58th out of 95 countries and the analysis suggests that the tax system is not a major deterrent to investment. Representatives with whom the mission met consistently noted that the tax system was not among the major problems facing investors. Rather, the challenges to higher investment, and ultimately growth, related primarily to non-tax business environment issues.

With respect to the main sections of this report, the key findings are:

Tax system and METRs

5.   Across all sectors examined but one, the METR on capital is lower than the statutory CIT rate of 28%. So while the statutory rate may be somewhat higher than that in other country comparators, accelerated depreciation schedules, investment allowances, and interest deductibility work to reduce the effective burden considerably.

6.   There is substantial variation in the METR across sectors. The METR on capital varies between 31.9% for iron ore mining, 23% for the electricity sector, 19.6% for manufacturing, and -19.7% for chrome mining. While there are very few system-wide tax incentives in South Africa, the sectors that do benefit from accelerated depreciation allowances and/or rely heavily on debt to fund their investment bear a significantly lower tax burden on their capital investment than what is implied by the standard CIT rate. The significant variation in METRs across sectors suggests further work is needed to determine whether the corporate tax code and system of accelerated depreciation and investment allowances may be (i) encouraging greater capital investment at the expense of labor, (iii) favoring some sectors at the expense of others who offer greater growth and job potential, and (iii) if the investment incentives are generating their intended benefits relative to their cost.

7.   The mining sector receives generous tax treatment relative to other sectors as its capital investment is subsidized. The analysis shows that the royalty rates for different minerals are a function of the profitability of the mining operation—the METR is highest for iron-ore because it was the most profitable mining sector activity in 2013. Despite this, the 100% or full expensing of capital investment in the first year generates a significant tax advantage for the mining sector, not to mention a lot of variation in the METRs within the sector reflecting differences in actual asset profiles by mineral. By way of contrast, for most other sectors outside mining, the capital investment allowances are overall positive to neutral for investment, with tax depreciation rates higher than economic depreciation rates in most cases/sectors. Even in the sectors where it is lower, the tax and economic deprecation rates are quite close to each other. The question arises whether the capital investment in mining should be given preferential treatment and if investment allowances in mining should be bought closer in line with other sectors, like manufacturing.

8.   For manufacturing we find that the METR is 19.6%, or 10.5% if the actual debt-to asset ratio is used. The analysis also showed that the 12I investment allowance results in a large subsidy for capital investments by those few firms that benefit from this particular incentive. These incentives could be rationalized in a revenue neutral manner. The threshold for qualification for this incentive has already been lowered in 2015 and this should broaden access to the scheme but

it will be important to carefully assess and monitor the effectiveness of 12I with respect to attracting new additional investment and jobs relative to its cost.

9.   Incorporating the METR on labor into to the overall METR facing investors does not fundamentally alter the finding that the overall burden is still lower than the statutory CIT tax rate. However, our estimates use the economy average capital and labor share and the calculations need to be refined to take into account variations in this ratio across sectors. With this caveat in mind, the overall METR when labor is included with capital spans a narrower range from between 1% for the mining sector to 20% for electricity, gas and water supply sectors. The METR on labor alone varies with the level of average wage in each sector. The METR on labor for firms ranges from just under 5½% in the tourism sector (where average wages are lowest) to about 11% in the electricity, gas and water supply sector (where average wages are highest).

10.   The ability to deduct interest from taxable income reduces the METR considerably even in sectors that receive no specific incentive. The analysis finds that investments in fixed assets funded by high levels of debt have reduced the marginal effective tax rates considerably because of the high levels of debt incurred in many sectors of the economy. The high level of indebtedness in and of itself is cause of concern and interest deductibility is a major tax policy issue globally. In this debate, it has been recommended by the Mirrlees Commission[4] that equity should also be entitled to a deduction at the risk free rate of interest.

11.   High inflation has a big impact on the METR mainly due to its effect on the burden on inventory under First In First Out (FIFO) accounting. This raises the METRs in those sectors in South Africa that have a high proportion of inventory such as manufacturing. There could be scope to lower this burden by switching from FIFO to LIFO accounting.

Sector level issues

12.   In the interviews conducted by the team, the tax system was not among the major problems facing investors in South Africa. The challenges to growth are primarily non-tax issues related to the business environment. Some common obstacles to investment noted across sectors were the reliability of electricity supply, labor relations, and policy uncertainty. Some sectors spoke of a lot of potential for public private partnerships in infrastructure that could remove key transportation and logistical bottlenecks, such as mining but also manufacturing. Some sectors such as tourism faced specific concerns about potential impact of new regulations (governing visas and travel with children) on the growth of the sector.

13.   A detailed analysis of the non-tax incentives administered by the DTI (such as cash grants and customs duty exemptions that are available to the automotive industry, those available for Research & Development (R&D) or the Manufacturing Competitiveness Enhancement Program, MCEP) was beyond the scope of this paper due to lack of available data at the firm level for customs duty exemptions and other financial incentives. Data on these incentives would be needed to obtain a full picture of the impact of all incentives offered on the effective tax burden faced by

---

[4] See the Mirrless Commission's report Tax by Design, 2011, Oxford University Press.

the manufacturing and other sectors. We encourage NT, DTI and SARs to compile a comprehensive and unified database to track and monitor all incentives offered. This would create an evidence base to facilitate more regular and fuller analysis of incentives to ensure they are achieving their goals.

14.   Lower tax rates for investments made in SEZs are being debated. As is always a risk, this has the potential of undermining revenue with possibly limited impact on investment. This is primarily because there is an incentive for investments to relocate inside the SEZs to take advantage of the lower tax rates. Investments within the SEZs would out-compete those outside resulting in the later losing competitiveness investments purely because of tax considerations.

II.   INTRODUCTION

15.   In August 2014, the World Bank Group was approached by the Davis Tax Commission to update the 2006 FIAS study to help the commission assess the performance of the tax system with regard to investment.[5] The Davis Tax Commission has been tasked by the Minister of Finance of South Africa, "*to assess our tax policy framework and its role in supporting the objectives of inclusive growth, employment, development and fiscal sustainability.*" Davis Commission and the World Bank Group agreed that a World Bank Group team would update the 2006 study on the marginal effective tax rates focusing particularly on manufacturing and a select number of sectors, and if data were available, investigate the link with investment outcomes, as well as building local capacity in the *marginal effective tax rates* (METR) methodology.[6]

16.   The report is prepared at a time when South Africa is experiencing slowing economic growth, subdued private investment, rising fiscal and external deficits and high unemployment. Real GDP growth has declined from a post crisis peak of 3.2 percent in 2011 to just 1.5 percent in 2015 amid labor unrest, more severe power shortages, and weak external demand. Private investment growth contracted in 2014 (-0.4% y/y) and consumption growth weakened slowest pace (1.4% y/y) since the onset of the global financial crisis of 2009. The slowdown in growth has put pressure on the fiscal and current account deficits. The fiscal deficit and gross debt burden of the general government stood at 3.7 percent and almost 47 percent of GDP in 2014/15 and the government has embarked on a fiscal adjustment comprising of new tax measures and reductions in non-core spending. The current account deficit narrowed slightly to 5.6 of GDP in 2014 and was largely funded through portfolio and other capital inflows as FDI inflows have remained relatively modest.

17.   While South Africa's revenue performance is comparable to other middle income countries its budget deficit leaves it vulnerable. Figure 1 plots 128 countries on the two dimensions of revenue performance and budget deficits, both measured as a percentage of GDP. South Africa is in the high deficit-low revenue grouping though its tax collection is only slightly below the median of 28.5% of GDP and the risk is that a negative revenue shock would push South Africa even further into the high deficit and low tax collection category. With respect to general government debt, South Africa is also in the wrong grouping among 71 countries for which (revenue and debt data was available) with higher debt and lower revenue than the median (Figure 2).

---

[5] In 2006, Foreign Investment Advisory Services (FIAS) a joint service of the World Bank and the International Finance Corporation (IFC) conducted a study of marginal effective tax rates in five key sectors of the South African economy to investigate whether these sectors are competitive domestically and internationally, as regards the impact of the tax regime.
[6] See Annex 1 for the detailed terms of reference.

Figure 1: South Africa's revenue performance and fiscal deficit in an international perspective
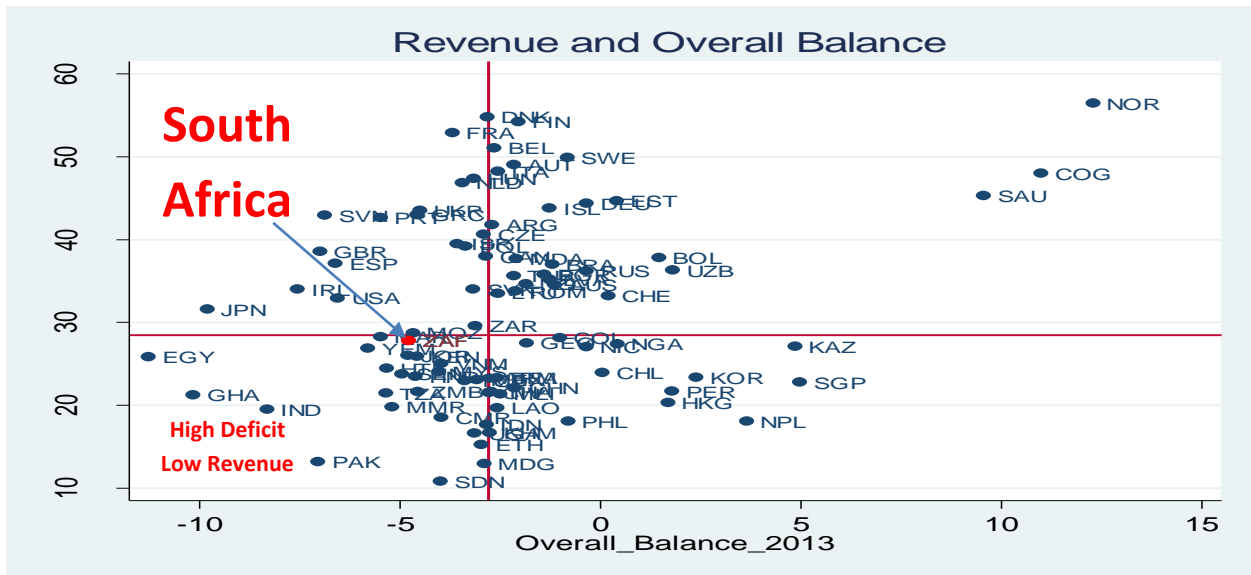
Source: IMF Fiscal Monitor 2014 and Authors' calculations

Figure 2: South Africa's revenue performance and debt burden in an international perspective
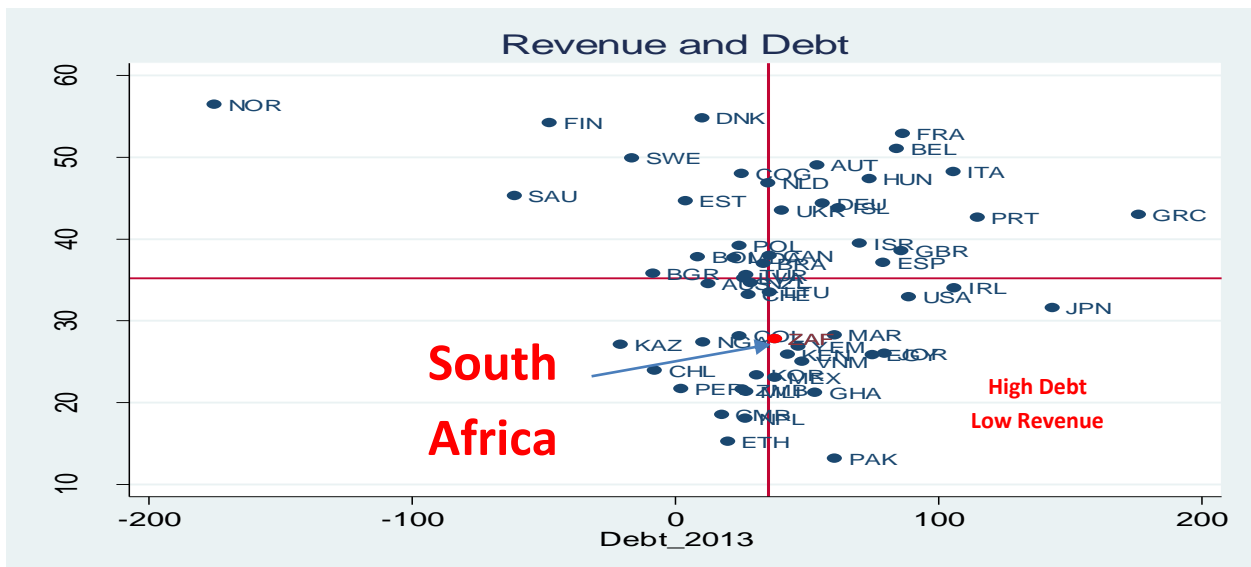
Source: IMF Fiscal Monitor 2014 and Authors' calculations

18.   Against this backdrop, it is timely to examine how the tax system is impacting investment and growth in South Africa. This report presents how the tax system impacts Marginal Effective Tax Rates (METRs) on capital investment. This is a measure of the burden of tax on investment

for a profit maximizing firm and determines the scale of a project: a higher METR means small size projects and fewer investments.[7] As a result, the METR is an important parameter to keep in mind when designing tax policy.

19.   The report is organized as follows: the second section presents an overview of the marginal effective tax rate methodology setting how the analysis improves upon that conducted in 2006. It also presents the METR by sector and compares it to that in other countries. This is followed in section four by a detailed sector level review of the METR calculations that are complemented by qualitative input collected from interviews with key players in each sector as to how the tax system and business environment impact their investment decisions and operations.

---

[7] The Average Effective Tax Rate (AETR) which is important for locational decisions of firms and hence an important determinant for FDI will be examined in part 2 of this report using firm level data.

III.   ANALYSIS OF THE MARGINAL EFFECTIVE TAX RATES IN SOUTH AFRICA

Overview of METR methodology

16.   The analysis of the METRs on capital helps asses how taxes can affect the rate of return required by investors on capital expenditure (See Annex 2 for a detailed theoretical background of the METR). Investors are assumed to undertake a given investment only if the expected earnings and/or capital gains generate a rate of return on their equity that is at least as high as what they could earn from alternative uses of their funds, usually taken to be an investment in relatively risk free government bonds. If the overall effect of corporation income taxes, withholding taxes, and other taxes, is to reduce the return on equity below what is available on new investments elsewhere, then investment is discouraged.

17.   The METR measures the wedge between the before-tax rate of return and the after-tax rate of return on marginal investments. The marginal investment is the last 'piece' of investment made by a profit maximizing firm. This means that the return on the marginal investment would be just equal to the opportunity cost of that investment (which is some combination of investing in the bond and stock market). In the case of investments that generate above-normal after-tax returns (i.e. infra-marginal investments), the Average Effective Tax Rate (AETR) is more appropriate. This is because investments generating above-normal returns are, by definition, profitable and therefore not likely to be deterred by the tax system unless the tax rates are egregiously high. For highly profitable investments however, the corporate tax rate is more relevant than the METR. Annex 2 shows the mathematical derivation of the METR and the fact that the AETR which is the effective tax rate on any investment is a weighted average of the METR and the statutory tax rate, with the weights being the ratio of the return on investment from the marginal investment and the return from that project. This means that for marginal investments, the ratio would give the METR the weight of 1 and the statutory rate a weight of 0. For highly profitable investment the statutory tax rate would have a weight of one while the METR a negligible weight. For investments that give returns in between, the AETR is the relevant measure.

18.   In a highly competitive world economy, most investments have little economic rent and thus are likely to be sensitive to the METR (rather than AETR which is relevant when there are economic rents to extract). In principle, it is possible to design a tax system that yields positive tax revenues while generating an METR equal to zero, implying that all viable investments would be undertaken. Such a system would collect tax revenues only from the investments enjoying above-normal returns with the marginal investment generating zero tax. It is also possible for the METR to be negative. This would imply that the tax system subsidizes implicitly investments that would otherwise not be undertaken. Hence the METR is very useful in determining the impact of the tax system on real investment decisions of taxpayers. To illustrate, Box 1 provides a simplified example of how the tax system can distort investment decisions of potential investors.

Box 1: An illustrative example of METR

A simple example of an METR calculation may be helpful. Consider a farmer who uses tractors to work on his farm. Say the farmer could earn after-tax return of 10% on his investment in the capital market. This is his hurdle rate of return which means that any alternative investment that does not give him this much would not be undertaken. Now suppose the first tractor he invests in his farm gives him a return of 20%. He then buys a second tractor and a third and so on. By the law of diminishing marginal returns, every additional capital (tractor) invested would give him less and less of return. This implies that the second tractor would give him say 19% of return on investment, the third 17%, the fourth to 14% etc. Eventually there are so many tractors in the farm that his return on his fifth tractor goes down to 10%. At this point additional investment in the form of tractors would give less than 10% returns and the farmer stops at five tractors. The fifth tractor is the marginal investment (when we neglect depreciation i.e. wear and tear).

Now suppose the tractor would experience depreciation of 4% annually. Ignoring the corporate income tax for the moment (we are assuming that the farm is incorporated), the tractor must generate an annual rate of return of at least 14 % to be worth acquiring - i.e., 4 % to compensate for the depreciating resale value of the tractor plus 10 % to compensate for the fact that the farmer could have earned this amount by investing its money in the capital market instead of buying the tractor. If, in this example, the return on the tractor is exactly 14%, then the fourth tractor is the marginal investment (The farmer would not invest in the fifth tractor as it is a losing investment). If the return exceeds 14%, the tractor is earning above-normal returns. If the tractor earns less than 14%, it is not a viable investment for the farmer.

So far we have abstracted from a corporate income tax. What is the effect of a corporate income tax on the investment decision of the farm? Assume the corporate tax rate is 18%. In order for a tractor to be a viable investment, it must earn such a return that after taxes should give at least 14% which is the hurdle rate of return after depreciation we calculated above. This means a return of C, such that $(100 - 18) \times C = 14\%$. The before-tax required rate of return is therefore $C = 14\%/(1-.18) = 17\%$ (figure is rounded for convenience). In this example, therefore the farmer would not invest in the fourth tractor as after taxes the return of investment would drop to below 14% which after depreciation (which is 4%) would be below what he could get from the market (which is 10%). However, his third tractor is a viable investment as it gives him 17% which is exactly equal to the minimum of 17% required after taxes and depreciation. Hence after taxes, the farmer would only invest up to three tractors in his farm. Further issues such as the taxation of dividends, sales tax on equipment can also be incorporated along with the corporate tax in the calculation of an investor's required rate of return.

The METR in this simple example is given by the ratio of the difference in the rate of return on the marginal investment before taxes and after taxes (the tax wedge) to the rate of return on the marginal investment before taxes. In other words, what percentage of the returns of the marginal

investments is given up to compensate for taxes. In this example, the METR is equal to (C-14%)/C or (17%− 14%) /17% =18% (figure is rounded for convenience) which is just the corporate tax rate. In the real world we need to incorporate the different tax provisions such as taxation of dividends, tax on equipment which increases the tax burden on investments raises the METR. On the other hand deductibility of interest (as against equity), accelerated depreciation, etc., lowers the METR. Hence the METR reflects the impact of the entire tax system on the marginal investment. It is possible that when the tax system in effect does not raise the before-tax required rate of return of investors as a result of the various tax provisions, C = 14%, and so the METR could equal 0.

19. The METR combines a wide range of effects of the tax system. For example:

 a. Elements of the tax system interact with macroeconomic variables and impact the METR on capital. For example, the ability to deduct interest payments on borrowed funds in the calculation of a corporation's taxable income lowers the effective cost of investments especially when there is inflation. This is because the nominal interest rate includes an inflation component which increases the size of tax deductions. Conversely, inflation can raise the effective tax rate on inventories under first-in-first-out inventory accounting. This occurs because the cost of "old" inventory reported on a company's income statement will be less than the item's current sales value which reflects the impact of inflation, and this artificially raises a company's taxable income.

 b. The depreciation rate in the income tax code can impact the METR. When this rate exceeds the "true" rate at which an asset wears out (the rate of economic depreciation), the investor receives, in effect, a tax concession.[8] Tax holidays and other special incentives can also be taken into account in the calculation of METR rates.

20. It is important to emphasize, some limitations of the methodology. METR calculations capture only the effects of the formal tax rules. Generally absent are considerations of tax administration, tax evasion and the informal economy. Payroll taxes and excise taxes on fuel are also omitted from consideration since, arguably, their amounts are unaffected by marginal increases in the capital stock. Property taxes affect the returns to capital but are excluded from our METR measure because the basis for the assessment of property values is subjective, thus unlikely to uniformly represent market values. METR analysis depends on some simplifying assumptions and abstracts from certain nuances of the tax code that cannot be readily captured in the calculations. *Thus the METR figures reported below should be interpreted as a tool for understanding the incentive effects of the business tax system in South Africa, rather than as precise values.*

21. It should be noted that the METR methodology used is the impact of the tax system on fixed capital and labor. Hence taxes that do not depend on physical capital or labor such as any fixed taxes or fees do not affect the METR on capital and labor. Further, some sectors by their

---

[8] The METR model we use contains estimates of actual economic depreciation rates by asset type in each sector, based on published research.

nature depend much more on labor than on capital. Hence a tax incentive that lowers METR on physical capital would encourage more investment in the physical assets and would likely benefit the manufacturing sector more than the services sector given the latter tends to be a sector that uses more labor. In such a case a decision may be made between a broader reform that lowers corporate tax rates for all (hence both labor and physical capital) rather than an approach that reduces the cost of only physical capital.

22.   Lower METRs for the same amount of investment in general results in lower tax revenue in present value terms. However, a lower METR implies more investment that can lead to higher growth. Hence the revenue impact is not necessarily lower. As mentioned above, a zero METR does not mean zero taxes. This only means that for the marginal investment, the returns on investment before and after taxes are exactly equal. However, investments made before the marginal investment all earn more than the hurdle rate of return and hence provide positive returns above the hurdle rate. Annex 3 presents the methodology on how the METR is calculated for different classes of capital.

Summary of the Marginal Effective Tax Rate Analysis for South Africa

23.   South African's major taxes comprise direct taxes on income, indirect taxes, as well as other taxes such as royalties. Tables 1 and 2 summarize the main parameters of these taxes, as well as the non-tax parameters used and the special tax treatment on investment in the different sectors that are used in the METR calculations. The estimates presented in this report are derived using the tax parameters that prevailed in 2014/15 and using data from 2014.

24.   The METR analysis improves on the 2006 methodology in several ways. First it extends the analysis to additional sectors including construction, electricity and transport and communications sector. Second it uses the actual asset structure of each sector reflecting some 13 different asset classes. The 2006 methodology assumed a uniform asset structure across the sectors derived from Canadian industry asset weights for just four assets. This study also calculates actual depreciation rates for 180 different assets using SARS write-off periods, where in 2006 the study used just the parameters for buildings and plant and machinery. Finally our study also uses the actual debt-asset ratios for each sector of the economy rather than an assumption of a 0.5 that was used in 2006. Table 3 shows exactly how the 2006 and 2014 calculations compare.

25.   The METR calculations have also been done only for the *tax* incentives administered by DTI which mainly comprises investment allowances. While there are few sector wide incentives there are several industry specific incentives. We are not able to capture the non-tax based incentives offered by DTI that take the form of direct cash grants, customs duty exemptions and are offered outside the corporate income tax system. However where there incentives offered that comprise investment allowances that can be deducted from income we have been able to make the METR calculations. For these tax-based incentives that are administered by DTI we find the METRs are very highly negative. This implies that the tax system subsidizes such investments in a big way.

Table 1: Principal taxes and non-tax parameters used in the METR calculations

Type of Tax	Rates	Remarks
Income Taxes		
Corporate Income tax (CIT)	28%	
Corporate Income Tax for Gold	34 – (170/x) %	x%= Taxable income from gold mining/Total revenue (turnover) from gold mining
Personal Income Tax (PIT)	Taxed at progressive rates from 18% to 40% in 2014.	Income was eligible for a primary rebate of R12,080 on the tax calculated in 2014.
Treatment of interest income	Taxed at the rates for PIT	Eligible for an interest exemption of R 23,800.
Treatment of Dividend income	15%	Withheld on distribution
Treatment of Capital Gains	Only 33.3% of the Capital Gains are included in the taxable income and calculated at the marginal PIT tax rate.	Accrual equivalent Capital Gains = $t*(1+r)^\wedge(1-j)$, where t is the personal tax rate which is 33.3% (the capital gains that is taxable at the PIT rates) times the average of the marginal PIT rates, j is the year when the gains are realized which is taken as 5 years, r is the personal post-tax discount rate which is taken to be equal to the international interest rate + inflation.
Indirect Taxes		
Value Added Tax	14%	
Property Tax (immovable property)	Various rates	0.15% for farming to 1.7% for commercial and business property.
Customs Duty	Various rates	Sectors such as manufacturing get rebates on customs duty.
Other Taxes		
Mining Royalty (unrefined ores)	0.5 + { EBIT / (Gross sales x 9) } x100, where EBIT is earnings before income tax	
Mining Royalty (refined ores)	0.5 + { EBIT / (Gross sales x 12.5) } x100	
Electricity Levy	35 cents/kwh	For generation of electricity from polluting sources. Taken as 1% of the turnover.

Non-Tax parameters		
Prime Lending Rate	9.3%	In 2014.
Inflation rate	5.9%	September 2014.
International interest rate	0.2%	LIBOR rate for US$ in September 2014.
Dividend payout ratio	50%	50% of the profits are reinvested while 50% are distributed. This has relevance when calculating the tax rate on equity. $T_e=\gamma T_d+(1-\gamma)T_c$ where T_e is the weighted average tax rate on equity, T_d is the "personal" tax rate on dividends (and/or the tax rate on dividend distributions), T_c the accrual equivalent tax rate on capital gains, and γ is the dividend payout ratio.
Debt-Asset Ratio	0.5	For sectoral level calculations, the actual rates from the Annual Financial Statistics 2013 are also used.

Source: Tax laws, Republic of South Africa, Reserve Bank of South Africa.

Table 2: Special Tax regimes for capital investment for the different sectors

Sector	Special Treatment	Remarks
Manufacturing	Depreciation of Plant and Machinery of 40%, 20%, 20%, 20%	Additional depreciation benefits for investments in preferred sectors and IDZs
Agriculture	Depreciation of Plant and Machinery of 50%, 30%, 20%	
Mining	100% depreciation of Plant and Machinery; Employee housing are allowed to be depreciated at 10% straight line as compared to 5% straight line for other sectors	
Small Business Corporations	100% depreciation of Plant and Machinery used in manufacturing; Depreciation of Plant and Machinery of 50%, 30%, 20% for non-manufacturing activities	
Manufacturing (administered by Department of Trade and Industry)	Additional investment allowance of 100%, 75%, 55% or 35% depending on whether the investment is in the IDZ or is in a preferred sector	This is over and above those who qualify for the accelerated 40%, 20%, 20%, 20% depreciation schedule

Source: Tax laws, Republic of South Africa

Table 3: METR model parameters and assumptions in this report versus the 2006 report

Category	2006 report	This report
Sectors	Five sectors, manufacturing, agriculture, mining, finance and tourism.	Eight sectors largely the same as the primary industry categories that the Annual Financial Statistics (AFS) of South Africa comes out with yearly.
Asset Classes	Four categories of assets, Equipment, Buildings, Land and Inventory.	Thirteen different assets classes. These asset classes have been taken from the AFS 2013.
Asset Weights	Based on Canadian industry asset weights.	Actual asset weights based on AFS 2013.
Economic Depreciation of assets	Based on Canadian industry research but had the values for two assets, buildings, and plant and machinery.	Economic depreciation was calculated for each asset class for the different sectors using the nearly 230 different assets based on a 2005 study done using the economic lives of Canadian and US assets.
Tax Depreciation	Based on the treatment of depreciation by the South Africa tax system for two assets, buildings, and plant and machinery	Tax depreciation was calculated for each asset class for the different sectors using SARS write-off periods for nearly 180 different assets
Cost of Debt	Imputed for the open economy model from the international interest rate *plus* South Africa's inflation rate	The prime lending rate as shown on the South Africa Reserve Bank website
Debt-Asset ratio	0.4	The main ratio used was 0.5. However results have been shown for various debt-asset ratios including the actual ratios for each sector based on AFS 2013
Burden on Labor	Did not include the burden on capital	Includes both the burden on capital as well as labor

26.   **Mainly reflecting the impact of the accelerated depreciation allowances offered by the South African corporate income tax code, the average economy-wide METR is considerably lower in South Africa than the statutory CIT tax rate of 28%.[9]**

27.   **METRs show significant variations across sectors (Table 4).** This reflects the differences in tax rates across some sectors (as per Table 1) as well and the accelerated depreciation allowances (Table 2). The accelerated depreciation allowances generate a "tax advantage" that depends on how the tax rate of deprecation compares to the actual rate of economic depreciation for different asset classes (for example buildings depreciate far slower than heavy machinery) as well as the actual asset mix/structure of a given sector. Thus even when the depreciation allowances for separate asset class are the same in different sectors, the fact that sectors use

---

[9] The corporate income tax code does not offer tax holidays or reduced rates.

different mixes of assets causes the METRs to vary. Our METR calculations use the actual asset structure of each sector which is an improvement on the 2006 methodology than had assumed a uniform asset structure across sectors.[10] Lastly, METR for inventory is the result of the FIFO accounting for inventory in South Africa whereby assets that are bought first are treated as sold first. This means that any changes in the value of inventory due to inflation results in higher taxation and higher METRs.

28.   **Table 4 shows the METR for the manufacturing sector is the second highest among the sectors but below the statutory corporate tax rate.** The METR of 19.6% (relative to a statutory CIT rate of 28%) is primarily driven by the high weight of inventory (40.4%) in the asset structure of this sector as well as the comparatively high rate of inflation in South Africa (5.9% in September 2014). When the inflation rate is changed say to 2%, the METR reduces to 12.1% showing the sensitivity of the METR on inventory to inflation. Plant and machinery investment do benefit from the accelerated depreciation, as illustrated by the negative METR for these asset classes. This moderates the impact of the inflation on inventories under the FIFO method.

29.   **The METRs for the electricity sector is the highest reflecting the impact of the electricity levy.** The case study models the levy as a 1% turnover tax. Another factor that drives the high METRs is the high weight for capital works in progress (50% of the assets) in this sector. The divergence between the tax depreciation and the economic depreciation drives the METR to 23%. It is assumed that this sector does not benefit from any special investment allowances. We discuss further in the subsequent section that examines the calculations by sector in more detail.

---

[10] Data on actual asset mix by sector were derived from Stats SA 2013 Annual Financial Statistics (AFS)—the latest available at the time of the mission. We have checked that the asset mix in 2013 was not exceptional relative to the asset mix reported in the earlier vintages of the AFS.

Table 4: Marginal Effective Tax Rates on Capital: South Africa

METR For investment in Asset:	MANUFACTURING	MINING *	FORESTRY and FISHING	CONSTRUCTION	TOURISM	SERVICES (not including Finance)	TRANSPORT, STORAGE & COMMUNICATION	ELECTRCITY, GAS and WATER SUPPLY
Land	11.4%	15.1%	11.4%	11.4%	11.4%	11.4%	11.4%	12.3%
Residential buildings	5.8%	-3.3%	3.5%	3.5%	3.5%	3.5%	3.5%	7.0%
Non-Residential Buildings	23.8%	28.1%	12.3%	9.5%	3.5%	3.5%	3.5%	7.0%
Construction Works, Roads and Parking areas	18.8%	20.9%	49.9%	47.2%	18.8%	18.8%	18.8%	22.4%
Land improvements	11.4%	-17.6%	-24.6%	-24.6%	-24.6%	11.4%	11.4%	12.3%
Network equipment	13.6%	31.8%	25.6%	25.6%	25.6%	25.6%	21.0%	33.2%
Computers and other IT Equipment	8.6%	23.7%	37.6%	18.2%	37.6%	37.6%	37.6%	45.7%
Motor Vehicles and Other Transport equipment	9.2%	24.6%	29.1%	11.0%	19.4%	19.4%	10.2%	29.7%
Plant, Machinery and other office equipment	-3.1%	-30.5%	6.3%	3.7%	2.2%	10.1%	8.3%	-7.9%
Capital work in progress	-5.9%	-30.3%	35.8%	29.3%	34.1%	34.9%	30.9%	37.4%
Other property, plant and equipment	-5.9%	-17.0%	35.8%	29.3%	34.1%	34.9%	30.9%	37.4%
Computer software	11.9%	29.7%	11.9%	11.9%	11.9%	11.9%	11.9%	25.2%
Inventory	35.5%	30.8%	35.5%	35.5%	35.5%	35.5%	35.5%	36.4%
Overall METR	**19.6%**	**-1.2%**	**17.0%**	**19.5%**	**6.1%**	**14.0%**	**18.8%**	**23.0%**

Source: World Bank Staff calculations.

*Mining METR shown in the table is the weighted average of the METRs for the various minerals weighted by turnover in 2013.

30.   **Tourism has one of the lowest METRs reflecting the negligible weight of inventory in its asset structure.** The low METRs for buildings combined with the fact that nearly 70% of the sector's assets constitute buildings bring the METR for tourism to 6.1%. Another contributor, albeit a small one, is the 20% annual straight line depreciation for plant and machinery for hotels.

31.   **The METR for the mining sector is -1.2% (weighted average across mineral) and is the lowest of all the sectors examined.** METRs across the sector vary considerably depending on the mineral type and asset structures. The variation is driven by two key differences relative to the other sectors:

   i.   First, the sector pays royalty depending on whether the ore is refined or unrefined and the royalty rates are determined by the profitability of the business as measured by EBIT/Gross Sales (where EBIT is earnings before income tax). The introduction of the royalty since the 2006 report has reduced the tax advantage enjoyed by the mining sector somewhat.[11]
   ii.   Second, investment in plant and machinery is expensed at 100%, i.e. mining companies can immediately and fully write off their capital investment in the year it is incurred. This generates a significant subsidy to capital investment in equipment in this sector.

In the case of gold there is another difference with the corporate tax rate is based on the gold tax formula which starts at 45% for highly profitable projects but can go as low as zero for mines whose taxable income to revenue ratio is less than 5%. The METRs for each mineral is in Section IV and ranges from a high of 31.9% for iron ore to a low of -19.7% for chrome.

32.   **We also calculate the METR on labor for the portion of the tax burden that is borne by the employer.** The METR for labor estimates the average tax burden on labor (Table 5) that earns the average wage in that sector including personal income tax and unemployment insurance fund. It is assumed that half of that tax burden is borne by the employer and half by the employee. The burden on labor is highest for the electricity sector (11%) where according to the Quarterly Employment Statistics 2014 average monthly earnings are the highest, and lowest for the trade and tourism sector (5.3%) where earnings are the lowest.

---

[11] The METR in mining was 0.4% in 2006. However the calculations in the 2006 report did not include 100% deduction for investment in capital equipment. If this were included the METR for mining in 2006 the METR of -32% would have revealed a significant tax subsidy to the sector.

Table 5: METR on labor for major sectors in South Africa

	Monthly Earnings including Bonus and Overtime (Rands)	Yearly Earnings (Rands)	Tax Wedge	Tax Burden on the Employer
Mining	18,990	227,880	15.6%	7.8%
Manufacturing	15,184	182,208	13.3%	6.6%
Electricity, Gas and Water Supply	34,314	411,768	21.9%	11.0%
Construction	12,778	153,336	11.7%	5.9%
Trade & Tourism	11,264	135,168	10.6%	5.3%
Transport, Storage and Communication	20,799	249,588	16.4%	8.2%
Financial intermediation	17,523	210,276	14.8%	7.4%
Community, Social and Personal Services	19,089	229,068	15.7%	7.8%

Source: Quarterly Employment Statistics December 2014 and Author's calculations.

33.   **Combining the tax burden on investors on capital and labor gives us the METR for overall production which ranges from 1% for mining to 20% for electricity (Table 6).** This using the average economy wide capital share of about 73% in the income. (The precise weight for Capital and Labor in the production function for the different sectors was not available at the time of writing this report). The METR on production is a more comprehensive measure of the tax burden on business as it incorporates both the burden on capital as well as on labor (see Annex 3).

Table 6: METR on Capital and Labor (Production)

	MANUFACTURING	MINING	FORESTRY and FISHING	CONSTRUCTION	TOURISM	FINANCIAL and BUSINESS SERVICES	TRANSPORT, STORAGE and COMMUNICATION	ELECTRICITY GAS AND WATER SUPPLY
METR - Capital	19.6%	-1.2%	17.0%	19.5%	6.1%	14.0%	18.8%	23.0%
METR – Labor	6.6%	7.8%	6.6%	5.9%	5.3%	7.4%	8.2%	11.0%
Labor Share in Income	27%	27%	27%	27%	27%	27%	27%	27%
Capital Share in Income	73%	73%	73%	73%	73%	73%	73%	73%
METR for Production	**16%**	**1%**	**14%**	**16%**	**6%**	**12%**	**16%**	**20%**

Source: Author's Calculation

34.   **The METR is very sensitive to the proportion of the investment financed by debt.** This is because the tax system allows the deduction of interest payments when calculating the taxable income lowering the cost of financing the investment via debt.[12] Table 7 shows the METRs for different debt-asset ratios as well the actual ratios from the AFS 2013. Table 4 on the other hand shows the METRs under a neutral debt-equity scenario, i.e. a ratio of 0.5. The actual debt-asset ratios are quite high in the case South Africa and this greatly reduces the METR for all the sectors. This is most notable in the case of tourism that has the highest debt-asset ratio for any of the sectors studied of 0.78. This takes its METR down to negative levels.

---

[12] Without interest deductibility, the cost of finance (Rf) in nominal terms is the weighted average of the cost of debt, (the nominal interest rate, i) and the return from equity ρ, i.e. $Rf = \beta i + (1-\beta)\rho$ where β is the debt-asset ratio. However with interest deductibility $Rf = \beta i (1-u) + (1-\beta)\rho$, where the cost of debt is now $i(1-u)$ where u is the corporate tax rate.

Table 7: METRs under different Debt-Asset ratios for South Africa

D/A Ratios →	0.4	0.5	0.6	0.7	0.8	Actual D/A ratio for SA	METR for Actual D/A ratio
MANUFACTURING	25.6%	19.6%	12.1%	3.4%	-6.8%	0.62	10.5%
MINING (COAL)	-5.2%	-16.1%	-29.3%	-45.0%	-64.3%	0.59	-27.9%
FORESTRY and FISHING	52.9%	17.0%	8.9%	-0.6%	-11.8%	0.58	10.6%
CONSTRUCTION	26.1%	19.5%	11.9%	3.1%	-7.2%	0.77	-3.9%
TOURISM	14.7%	6.1%	-4.0%	-16.0%	-30.5%	0.78	-27.4%
SERVICES (except FINANCE)	21.5%	14.0%	5.3%	-4.9%	-17.1%	0.63	2.4%
TRANSPORT, STORAGE and COMMUNICATION	25.6%	18.8%	11.1%	2.1%	-8.6%	0.70	2.1%
ELECTRCITY, GAS and WATER SUPPLY	29.2%	23.0%	16.0%	7.9%	-1.6%	0.73	5.2%

35.   **The debt-asset ratios vary a lot by sector and are high by international standards.** Table 8 shows the debt-asset ratios for some countries in the Euro area including Spain before the financial crisis. The ratios for South Africa are on average 0.15 points above those for the Euro area (not including Spain) showing that the South African firms are highly leveraged as compared to firms in the euro-area. The overall debt-asset ratio for all industries for South Africa in 2013 was 0.65 which was the same as in 2012.

36.   **Tax incentives such as investment allowances and accelerated depreciation give preference to certain sectors.** However, preference may also be provided by the regular depreciation rates if these are more generous than the economic depreciation. Table 9 shows that the tax depreciation schedule provides benefits for the manufacturing, coal, forestry and fishing and construction sectors. On the other hand the tax depreciation is lower than the economic depreciation for the tourism, transport and communication and electricity, gas and water supply. It is neutral in the case of the finance and business services.

Table 8: Debt-Asset ratios for the Euro-area (2007)

DEBT/TOTAL ASSETS	Spain	France	Germany	Italy	Portugal	Belgium	Weighted average (Excl. Spain)	Average (excl. Spain)
Manufacturing	0.60	0.57	0.43	0.61	0.57	0.50	0.52	0.54
Real estate	0.63	0.63	0.65	0.62	0.72	0.55	0.63	0.63
Construction	0.76	0.69	0.67	0.74	0.72	0.52	0.69	0.67
Electricity, gas and water supply	0.49	0.41	0.38	0.52	0.49	0.56	0.43	0.47
Wholesale and retail trade	0.64	0.66	0.60	0.74	0.66	0.60	0.65	0.65
Hotels and restaurants	0.60	0.68	0.45	0.65	0.64	0.68	0.58	0.62
Transport, storage and communications	0.47	0.66	0.39	0.57	0.64	0.50	0.53	0.55
Average	0.60	0.61	0.51	0.63	0.63	0.56	0.58	0.59
Weighted average as a function of Gross Value Added	0.62	0.63	0.52	0.64	0.64	0.54	0.58	0.59

Source: Izquierdo, A.F. and Carrascal C.M. 2010. Debt of Spanish non-financial Corporations. Development over time and comparison with Euro area, in Economic Bulletin, July 2010 Debt of Spanish Non-Financial Corporations. Banco De Espana.

Table 9: Economic vs. Tax Depreciation (without tax incentives) for Sectors

	Economic Depreciation	Tax Depreciation	Tax Preference (Tax Depreciation > Economic Depreciation)
MANUFACTURING	10%	21%	YES
MINING (Coal)	14%	19%	YES
FORESTRY and FISHING	9%	22%	YES
CONSTRUCTION	11%	23%	YES
TOURISM	8%	6%	NO
FINANCIAL and BUSINESS SERVICES	9%	9%	NEUTRAL
TRANSPORT, STORAGE and COMMUNICATION	16%	10%	NO
ELECTRCITY, GAS and WATER SUPPLY	14%	12%	NO

South Africa and International comparisons of METRs

37.   **The METR for physical capital for South Africa in manufacturing of 15.5%--which re-calculated using internationally standard non-tax parameters so to highlight more clearly differences arising from variance across countries' tax codes-- is 58th out of the 95 countries for which they have been calculated (Figure 3)**. The METRs for these 95 countries are calculated annually (Mintz and Chen) using the same methodology as in this report with some differences. In particular they use an asset basket (based on Canadian data) that is common across countries and a fixed debt-asset ratio of 0.4. They also derive the nominal interest rates for each country as the international interest rate *plus* inflation which is based on the principles of international arbitrage. These assumptions are useful to keep the non-tax factors constant across countries and only see the variation on the METRs due to the tax factors. These differences as well as different rates of economic depreciation explain why the reported METR for South Africa based on this international comparison is different from that reported in Table 4. It is not possible to recreate the model used by Mintz and Chen as they consider the parameters used as proprietary information. However, the model and parameters used in the 2006 METR report that was prepared by Ken McKenzie from the same university as Mintz and Chen is likely to be similar to what is used by these authors. Plugging in the corporate tax rate 28%, the debt-asset ratio of 0.4, the inflation rate of 5.5% for 2013 in the 2006 model gives an METR of 15.0 which is close to the rate for South Africa that is shown in their report.

38.   The statutory corporate tax rates are also reported in Table 10. The statutory rate is also an important factor for businesses that earn high economic profits. Annex 2 explains that the AETR is a weighted average of the METR and the statutory tax rate with the weights being the ratio of the rate of return for the business to the rate of return on a marginal investment. In the case of a profit maximizing firm, this ratio is 1 and hence the METR is the relevant factor. However, when discrete investment choices are made (as discussed above), a firm that has a specific advantage such as a patent and because of economies of scale cannot build more than one plant and would earn higher than the marginal investment (In the example shown in Box-1, this would be the case if say the farmer just invests in one tractor earning a return of 20% rather than 10% if he invests in five tractors). Because of this, the Average Effective Tax Rate becomes the relevant measure. The maximum marginal Personal Income Tax rates are also relevant because businesses owned by individuals (unincorporated businesses) are taxed under the personal income tax regime; however, the METRs in Figure 3 and Table 10 are calculated for corporations.

Figure 3: South Africa: METRs for physical capital in Manufacturing (2014) – international comparison
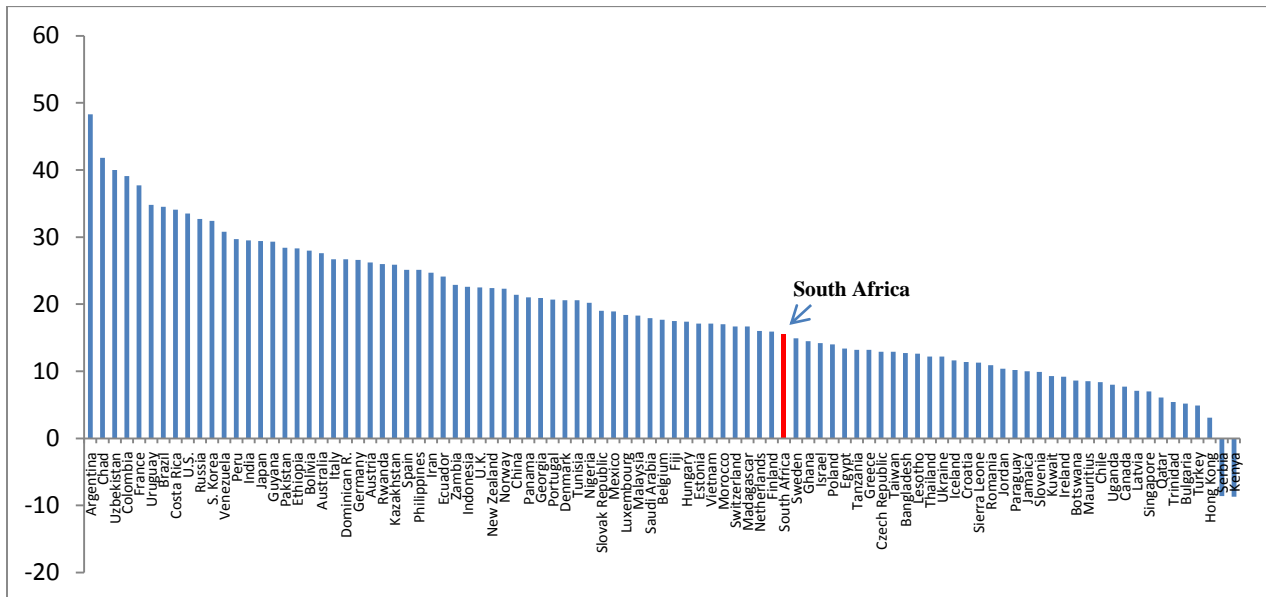
Source: Chen, D. & Mintz, J. 2014.The 2014 Global Tax Competitiveness Ranking: A Proposed Business Tax Reform Agenda, University of Calgary

39.   **The international comparison (Table 10) suggests that South Africa's corporate income tax regime is competitive.** This is true both of the manufacturing as well as the service sector. While its METRs are higher than the low-METR countries of some countries in Asia and Africa, it is lower than that of many countries in Latin America and Europe. Despite the fact that South Africa has comparatively high statutory CIT rate of 28%, its accelerated depreciation allowances lower the METR. These depreciation allowances reduce the corporate income tax base on which the standard CIT rate is applied, which has the effect of significantly lowering the effective tax burden. Consequently, the effective tax rate is considerably lower in South Africa than the statutory tax rate. South Africa's top Personal Income Tax rate is higher than most countries.[13] This rate is important because certain small businesses operated by individuals may bear this high rate of tax.

---

[13] See the World Bank's South Africa Economic Update 6 for how the graduated PIT rate structure helps make the PIT progressive.

Table 10: METRs in South Africa and around the World

Country	Corporate Tax Rate	METR for Manufacturing	METR for Services	Maximum Personal Income Tax Rate
South Africa	**28%**	**15.5%**	**13.4%**	**41%**
Africa low METRs				
Botswana	22%	8.3%	12.5%	25.0%
Mauritius	15%	8.7%	7.8%	15.0%
Uganda	30%	5.3%	11.9%	30.0%
Africa (other countries)				
Chad	40%	38.9%	34.5%	60%
Nigeria	32%	20.1%	10.4%	24%
Rwanda	30%	26.8%	17.1%	30%
Asia Low METRs				
Hong Kong	16.5%	3.1%	3.4%	15.0%
Singapore	17%	7.5%	10.3%	20.0%
Qatar	10%	7.5%	5.0%	0.0%
Latin America low METRs				
Mexico	30%	18.9%	17.0%	30.0%
Ecuador	22%	25.0%	18.5%	35.0%
Bolivia	25%	29.3%	20.0%	13.0%
G-7 Countries				
USA	39.1%	33.5%	36.8%	35.0%
France	34.4%	36.9%	34.9%	45.0%
Japan	37.0%	29.4%	29.3%	50.0%

Source: Chen, D. & Mintz, J. 2014.The 2014 Global Tax Competitiveness Ranking: A Proposed Business Tax Reform Agenda, University of Calgary

Conclusions and recommendations from the METR analysis

40.   The following are the conclusions and recommendations flowing out of the section on METR:-

- South Africa's METR on physical capital is internationally competitive. The METR on manufacturing ranking 58th out of 95 countries for which these calculations have been made. Across all sectors examined but one, the METR on capital is lower than the statutory CIT rate of 28%. So while the statutory rate may be somewhat higher than that in many other comparators, accelerated depreciation schedules, investment allowances, and interest deductibility reduce the effective burden considerably.

- There is substantial variation in the METR across sectors. The METR on capital varies between 31.9% for iron ore mining, 23% for the electricity sector, 19.6% for manufacturing, and -19.7 for chrome mining. While there are very few system-wide tax

incentives in South Africa, the sectors that do benefit from accelerated depreciation allowances and/or rely heavily on debt to fund their investment bear a significantly lower tax burden on their capital investment than what is implied by the standard CIT rate. The significant variation in METRs across sectors suggests further work is needed to determine whether the corporate tax code and system of accelerated depreciation and investment allowances may be (i) encouraging greater capital investment at the expense of labor, (ii) favoring some sectors at the expense of others who have growth and job potential, and (iii) if the investment incentives are generating their intended benefits relative to their cost.

- The mining sector receives generous tax treatment as its capital investment is subsidized. The analysis sheds light that that royalty rates for different minerals are a function of the profitability of the mining operation—the METR is highest for iron-ore because it was the most profitable mining sector activity in 2013. Despite this, the 100% or full expensing of capital investments in the first year generates a significant tax advantage for the sector, not to mention a lot of variation in the METRs across ores due to difference in actual asset profiles across minerals. By way of contrast, for most other sectors outside mining, the capital investment allowances are overall positive to neutral for investment, with tax depreciation rates higher than economic depreciation rates in most cases/sectors. Even in the sectors where it is lower, the tax and economic deprecation rates are quite close to each other. The question arises whether the capital investment allowances in mining should be bought closer in line with other sectors, like manufacturing.

- For manufacturing we find that the METR for physical capital is 19.6%, or 10.5% if the actual debt-to asset ratio is used. The analysis also showed that the 12I investment allowance results in a large subsidy for capital investments by the few firms that benefit from this particular incentive. While the threshold for qualification for this incentive has been lowered in 2015 to broaden access to the scheme, it will be important going forward to carefully asses the effectiveness of 12I with respect to attracting new additional investment and jobs relative to its costs.

- Including the METR on labor to the overall tax burden faced by investors does not fundamentally alter the finding that the overall burden is lower than the statutory CIT tax rate and there is significant variation across sectors in the burden. However our estimates use the economy rate average capital and labor share and the calculations and need to be refined to take into account variations in this ratio across sectors. With this caveat, we see that the overall tax burden when labor is included varies from between 1% for mining to 20% for electricity, gas and water supply sectors. The METR on labor alone, which varies depending on the level of average wage in each sector, is lower than the burden on capital and generally ranges from just under 5½% in the tourism sector (average wages are lowest) to about 11% in the electricity, gas and water supply sector (where average wages are higher).

- Investments in fixed assets funded by high levels of debt reduce the effective tax rates across all sectors considerably. However, the high levels of debt in some sectors are a cause of concern and interest deductibility is a major tax policy issue globally. In this debate, it

has been recommended by the Mirrlees Commission that equity should also be entitled to a deduction at the risk free rate of interest.[14]

- High inflation has a big impact on the METR mainly due to its effect on the burden on inventory under First In First Out (FIFO) accounting. This raises the METRs in those sectors in South Africa that have a high proportion of inventory such as manufacturing. There could be scope to lower this burden by switching from FIFO to LIFO accounting.

---

[14] See the Mirrless Commission's report Tax by Design, 2011, Oxford University Press.

IV. DETAILED METR ANALYSIS FOR SELECTED SECTORS

Manufacturing

Brief background

41.   The role of the manufacturing sector in the economy has been in decline. Manufacturing has declined from 16% in 2007 of total GDP to just under 12% in 2014.[15] Nevertheless it remains the fourth largest contributor to GDP. In 2014, it accounted for 11.6% of total employment (the fourth highest sector in the economy). However, employment in the sector has been in steady decline from 1.9 million in 2010 to about 1.7 million in 2014. The sector attracted 18% of total FDI to South Africa in 2012 whereas the finance and insurance sector attracted 36% of the total, and mining and quarrying sector attracted 31%. Over the past eight years, it attracted about 20% of total investment (measured by gross fixed capital formation).

Figure 4: Sector contribution to Gross Fixed Capital Formation, 2013
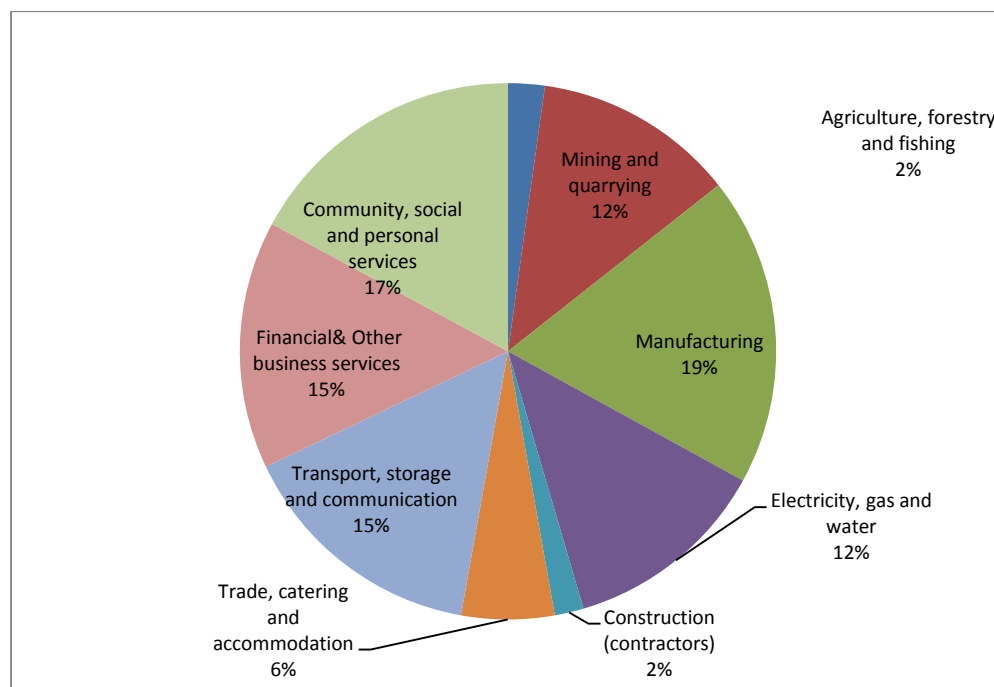
Source: National Accounts (2014)

---

[15] In 2014, the manufacturing sector was impacted by strike activity.

Figure 5: Sector contribution to employment, 2013
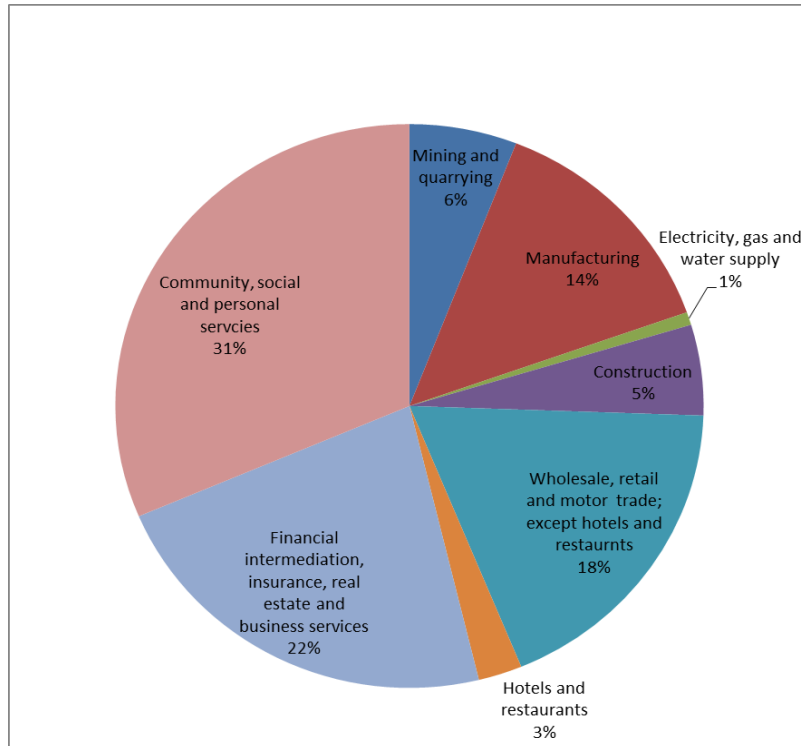
Sources: Quarterly Employment Statistics, Statistics South Africa

Taxation of the Sector

42.   Tables 1 and 2 showed the standard tax regime as well as the special regime that applies to the manufacturing sector.

The accelerated tax depreciation schedule that applies to the sector is

- For equipment is 40:20:20:20,
- For buildings the rate is 5% on commercial buildings (i.e. straight line depreciation of 20 years).
- Small business corporations can apply a 100% depreciation allowance on plant or machinery used in manufacturing. There is also the option of an accelerated depreciation allowance of 50:30:20 on other items (machinery, plant, implement, utensil, article, ship, and aircraft) (South African Revenue Services, 2014a).

In addition several other incentives and grants are offered in the manufacturing sector:

43.   **The 12I Tax Allowance:** An additional investment and training allowance for industrial projects that is administered by DTI. Up until end-2014, this incentive allows companies with a minimum investment of R200 million to claim additional allowances on green or brownfield industrial investment. Investments are differentiated by preferred or qualifying status depending

on the extent of compliance with a set of criteria (which is scored on a point system). The criteria include energy efficiency, business linkages, SME procurement, employment creation, location in Industrial Development Zone (IDZ), and training of employees. A score of 5 qualifies an investment for special tax treatment and a score of 8 moves an investment from qualified to preferred. Greenfield projects with preferred status can deduct from earnings 55% (or 100% if located in an IDZ) of the cost of industrial assets, up to a maximum of R900 million. In the case of qualifying status projects, the deduction is 35% (75% if in an IDZ), up to a maximum of R550 million. A training allowance makes provision for a maximum deduction of R36 000 per employee. Up to April 2014, some 42 projects were approved by the Department of Trade and Industry (Department of Trade and Industry, 2014a) for this incentive. Following the mission's visit, the window for this tax allowance was extended in 2015 and the threshold for qualification was lowered to R50 million for green field investments and R30 million for brownfield.

44.   The 12I Tax Allowance program had between the period of May, 2011 and November 2014 provided investment allowances of approximately 14 billion Rand which when deducted from the taxable income at the rate of 28% costing the government approximately 4 billion Rand in taxes. DTI data shows that this resulted in 6195 direct jobs and 65,638 indirect jobs implying an average of 55,000 Rand per job. However, this analysis has a flaw because it is not clear if the 14 billion Rand of investment would have happened even without the tax incentives.

45.   A more accurate way to measure the effectiveness of this incentive is to consider the elasticity of jobs to the incentive econometrically. In the absence of such data one could attempt to estimate the incremental investment as a result of the incentive (both new investment that could have gone to other countries as well as any increase in the size of the investment as a result of the incentive) using investor motivation surveys.[16] An investor who reports that their investment would have been made even without the incentive is classified as a 'redundant' investor. In such a scenario, the cost of the incentive would be the lost tax revenue for investments that would have happened even without the incentive (the 'redundant' investors), and the additional jobs are those created by those investments that occurred only as a result of the incentive. When the redundancy ratio is 50% and it is further assumed that both kinds of investments (redundant or otherwise) were equally proficient in creating jobs, the simple average calculation as done by DTI may be used. However, in many countries this ratio could go as high as 90%, i.e. 90% of the investment would have happened even without the incentive (Such a ratio is not available for South Africa). A high ratio would imply lower effectiveness of the incentive while a low ratio would mean otherwise (See James, 2014).[17]

46.   **Scientific & Technological Research and Development Incentive**: Companies who conduct research and development can deduct 150% of the expenditure incurred related to these activities (South African Revenue Services, 2014a).

47.   **Automotive and Production Development Programme (APDP):** The APDP (effective from 2013) is driven by four instruments: import duties, production incentive, vehicle assembly

---

[16] This survey was first designed by Bruce Bolnick for Mozambique in 2006. The survey methodology has now been used in over 15 countries by the World Bank Group.

[17] James, Sebastian. 2014. Effectiveness of Tax Incentives – Evidence and Policy Implications. Policy Working Paper. The World Bank Group.

allowance, and the automotive investment scheme. The latter is a non-taxable cash grant of a minimum of 20% of capital investment in productive assets (Department of Trade and Industry, 2014c). The APDP is aimed at incentivizing local production, as opposed to the Motor Industry Development Programme (predecessor to the APDP) that was export-oriented. The APDP has been set a target to reach 1.2 million vehicles per year by 2020.

48.   **Employment tax incentive (ETI)**: The ETI, effective from January 2014, is geared to incentivizing employment of young work   seekers. Firms qualify for a reduction in the amount of Pay-As-You-Earn tax, depending on the   number of employees who qualify for the ETI. Some of the requirements for qualifying   employees are that they must be newly employed (from 1 October 2013), have a South African identity document, and aged between 18-29 years (SARS, 2014).

49.   **Learnership Allowances:** Employers are allowed a deduction if they enter into learnership agreements with learners. An amount of R30 000 per annum is awarded for a registered learnership agreement. A completion allowance of R30 000 can be claimed if the learner successfully completes the learnership agreement. If the learner is a person with a disability, an additional amount of R20 000 may be claimed (South African Revenue Services, 2014b).

50.   **Industrial Development Zones (IDZ) / Special Economic Zones (SEZ):** The IDZ which commenced in 2000 was geared at attracting foreign direct investment and enhancing value-added exports (Department of Trade and Industry, 2012). It has since been replaced by the SEZ. Some of the special incentives associated with SEZ are additional allowances available to firms locating in a SEZ. For example, in the case of greenfield or brownfield investments, firms are allowed greater deductions (see earlier discussion). It is being proposed that firms may also qualify for a reduced corporate tax rate of 15% if they locate in a SEZ though this has not been finalized. In the case of the employment tax incentive, no age restriction applies.

51.   **Manufacturing Competitiveness Enhancement Programme (MCEP):** Firms qualify for a grant if they plan to upgrade or expand existing production facilities, processes or products. It comprises two components: the production incentive (such as capital investment), and industrial financing loan facilities such as the Industrial Policy Niche Projects Fund (Department of Trade and Industry, 2014b). Among the eligibility criteria include being a registered company in South Africa with established manufacturing operations and experiencing no reduction in employment compared to base-year employment when the incentive programme commenced, as well as maintaining employment levels for the remainder of the incentive program (Department of Trade and Industry, 2014b).

METR for the Manufacturing Sector

52.   The tax regime assumed for the METR calculations is straight line depreciation of 40:20:20:20 on equipment, and 5% straight line depreciation on buildings. Table 11 shows the METRs without taking into consideration the 12I investment allowances that are administered by DTI. Further the other incentives that are cash allowances or customs exemptions that are not related to investment do not affect the METRs. Table 11 assumes a 50% debt-to-asset ratio.

53.   The METRs are 19.6% for the manufacturing sector. The METR is highest for inventory investment (reflecting the higher burden as a result of inflation) and this raises the overall METR due to the high weight in the asset basket for inventory (40.4%) (In the 2006 report, the weight for inventory in Manufacturing based on Canadian asset weights was 27.7%).

Table 11: METR for the Manufacturing Sector

Asset Type:	Asset Value (R mill.)	Asset Weight	Economic Depreciation	Tax Depreciation (years straight line)	METR
Land	12,012	1.9%	-		11.5%
Residential buildings	1,412	0.2%	6%	20	5.8%
Non-Residential Buildings	52,914	8.3%	10%	20	23.7%
Construction Works, Roads and Parking areas	12,742	2.0%	9%	20	18.7%
Land improvements	1	0.0%	-		11.5%
Network equipment	86	0.0%	29%	5	13.5%
Computers and other IT Equipment	2,320	0.4%	26%	4	8.6%
Motor Vehicles and Other Transport equipment	15,559	2.4%	26%	4	9.2%
Plant, Machinery and other office equipment	249,221	39.0%	19%	5	-3.0%
Capital work in progress	24,198	3.8%	18%	11	-5.8%
Other property, plant and equipment	8,149	1.3%	18%	11	-5.8%
Computer software	2,922	0.5%	40%	2	11.8%
Inventory	258,292	40.4%	-	0	35.3%
TOTAL	**639828**	**100.0%**	**10%**	**21%**	**19.6%**

Source: World Bank calculations – see Annexure for details.

54.   The high rate of economic depreciation for buildings that are used in manufacturing (10%) as compared to the lower rate of depreciation for tax purposes 5% (1/20 years = 5%) raises the METR for non-residential buildings. Overall, the average weighted economic depreciation of all assets is 10%, but it is 4.83 years or 21% for tax purposes as shown in Table 11. This indicates a tax benefit for the manufacturing sector even without the accelerated depreciation. The tax incentives for the manufacturing sector that allow plant and machinery to be depreciated 40%, 20%, 20%, 20% reduces the METR for plant and machinery to negative, implying that investment in plant and machinery is subsidized. The combination of negative METRs and high weight of Plant and Machinery in the asset basket reduces the METR overall to 19.6%.

55.   The METRs in Table 11 assume a debt-to-asset ratio of 50%. If the actual debt-to-asset ratio of 62% in the Annual Financial Statistics is used the actual debt to asset ratio, the METR falls to 10.5%. This is due to the deductibility of interest when computing taxable income.

56.   Table 12 shows the METRs for SMEs in manufacturing that provides 100% capital allowance under Section 12E. When this is applied the METRs turns negative to an average rate of -4.7% for the sector reflecting the potential large benefit from this tax incentive.

Table 12: METR for SMEs

Asset class	METR
Land	-0.4%
Residential buildings	-6.7%
Non-Residential Buildings	15.2%
Construction Works, Roads and Parking areas	42.7%
Land improvements	-0.4%
Network equipment	-105.0%
Computers and other IT Equipment	-105.0%
Motor Vehicles and Other Transport equipment	-105.0%
Plant, Machinery and other office equipment	-105.0%
Capital work in progress	-105.0%
Other property, plant and equipment	-105.0%
Computer software	1.4%
Inventory	29.0%
TOTAL	-4.7%

57.   The mission analyzed the METRs for those in the manufacturing sector who benefit from the 12I incentives that go beyond the standard depreciation allowances for this sector. The METR is highly negative indicating a substantial subsidy—but it is difficult to interpret such highly negative METRs beyond saying it indicates a subsidy. This is because the METR is a ratio between the tax wedge (the difference between the gross rate of return on a marginal investment with taxes and the opportunity cost of capital i.e. the net rate of return) and the gross rate of return on the marginal investment with taxes. The very high investment allowance makes the gross rate of return with taxes negative (in effect a subsidy). As this gross rate of return (with taxes) goes towards zero and eventually becomes negative, the denominator goes closer towards zero the ratio first rises to an infinitely negative value eventually becoming infinitely positive as it crosses zero. Table 13 shows the gross rate of return on a marginal investment (or the User Cost of Capital) for different values of the investment allowance (see Annex 2). It shows that when the 12I investment allowance is 0%, the user cost of capital is 3.8% which is approximately 0.7% points higher than the opportunity cost of capital which is 3.1% (i.e. the weighted average of return from debt and equity). This implies an METR of 19.6% which is shown in the Table 11 above and reflects the fact that about of the fifth of a pre-taxed return of investment is absorbed by taxes. However as the investment allowances are included, the user cost of capital becomes progressively less than the opportunity cost implying a subsidy to investing.

Table 13: 12I Tax Incentives and its effect on the User Cost of Capital for Manufacturing

Investment Allowance (12i)	0%	35%	55%	75%	100%
User Cost of Capital	3.8%	2.2%	1.4%	0.5%	-0.5%

Key findings from interviews with industry representatives

58.   To complement the METR calculations, the mission also conducted interviews with business groups representing key players in the sector to learn about how the tax and business environment impact their operations on the ground. The key concerns raised by these industry representatives include tax on non-tax issues. On the tax side the key issues raised were:

- Lack of simplicity of the tax legislation. A complex system detracts from the benefits of the incentive and increases compliance costs.
- Certain aspects that attracted investment to automotive industry have now dissipated. For example steel is no longer as readily available; unreliability of electricity supply has also placed a damper on investment to this sector.
- In the case of the industrial project (12I) investment allowance, concerns were raised about the high investment thresholds to qualify for these incentives. A minimum investment of R200 million is required in the case of greenfield projects. These thresholds have since been revised downward in 2015.
- Businesses also indicated a lack of uniform application of the law by SARS creating a lot of uncertainty. This was particularly an issue with non-binding advance rulings.

On the non-tax side the following issues were raised:

- The manufacturing sector faces challenges of service delivery including lack of electricity and water, as well as the pricing of these services.
- Labor market. Most stakeholders flagged the tense labor environment as particularly challenging for the industry.
- A policy disconnect exists between policy design and implementation.

Agriculture

Brief background

59.   The agricultural sector accounts for a relatively small share of overall GDP. It generated about 2.2% of total GDP in 2014 virtually unchanged from previous years. Animal products accounted for about 46.4% of the sector, compared to horticulture (25%) and field crops (28.6%) (Department of Agriculture, 2014). Employment in the agricultural sector has declined. According to the Industrial Development Corporation (2013), the sector has shed 1.1 million jobs since 1994;

one specific cause is the mechanization of farming operations. By end-2014 some 742, 000 were employed in the sector.

60.   Agricultural exports have risen over the past seven years. Figure 6 shows the value of exports rose from R26 million in 2005 to R52 million in 2012. The growth was driven largely by horticulture, which is expected to expand further over the next decade. According to BFAP Baseline (2014), exports rose further to R97 billion in 2013, of which approximately half were exported to Africa. The EU is the largest export destination for citrus produce, which faced uncertainties in 2013 due to problems associated with the Black Spot fungus which lead to stricter requirements on citrus exports (BFAP Baseline, 2014).

Figure 6: Value of Agricultural Exports
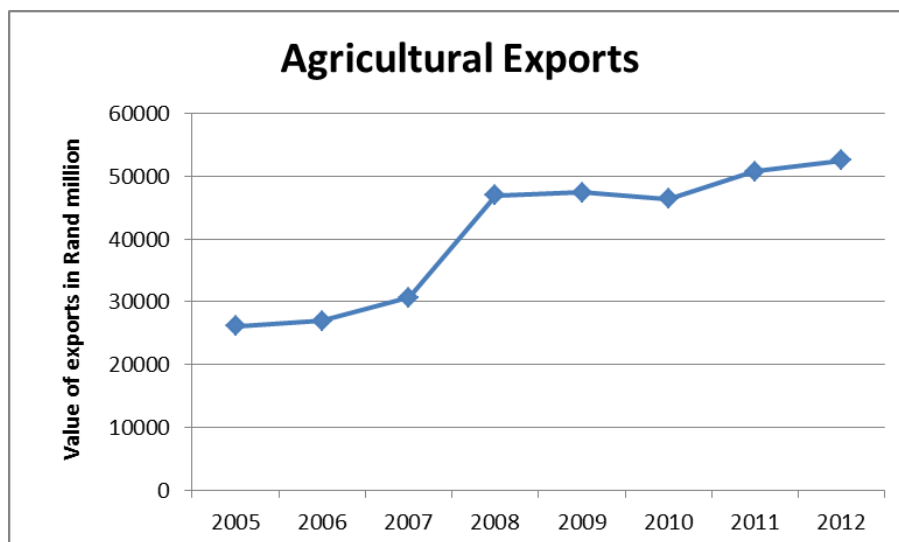
Source: Department of Agriculture, Forestry and Fisheries (2013)

Taxation of the agricultural sector

61.   If farms are operated as companies, the corporate tax rate of 28% applies, and dividends from profit distribution are taxable at a rate of 15%. Capital gains tax also applies at an inclusion rate of 66.6%. A VAT rate of 14% applies to goods supplied by the agricultural sector. Some supplies such as fertilizers are zero-rated. Farmers qualify for a diesel rebate that they can offset their VAT liability fund and equipment is depreciated on the basis of 50:30:20.

METR for the agricultural sector

62.   The tax regime for the METR calculation assumed straight line depreciation of 50:30:20 on equipment, and 5% straight line depreciation on buildings. The overall METRs are quite low with the highest METR arising for inventory investments. This does not have a large impact the overall sectoral level METR because inventory has a relatively low weight in agriculture as compared to other sectors such as manufacturing. Table 14 shows the METR by the four principal

assets (the asset classes for agriculture are not available in the AFS). The asset weights used in Table 14 was based on data collected by the Agriculture Department. The debt to asset ratio used was 0.5 as in the case of the other sectors. Actual debt-asset ratio was not available. The overall METR for the agriculture sector is 0.4% which lower that all the other sectors.[18]

Table 14: METRs for Agriculture

	Asset Value (R. million)	Asset Weight	Economic Depreciation	Tax Depreciation(B) (years straight line)	METR
Land - Farm Land	126,608	42.2%			-11.1%
Building - Fixed improvements	57,694	19.2%	2%	20	-19.0%
Plant and Machinery - Implements, motor vehicles and tractors	56,593	18.9%	16%	6	-19.6%
Inventory - Livestock	58,950	19.7%			35.5%
TOTAL	**299845**	**100.0%**			**0.4%**

Key findings from interviews with industry representatives

63.   Based on discussions with the private sector, tax issues were not seen to be an important factor in impacting agricultural operations and investments. However, interviewees noted three non-tax issues that significantly impact the sector. The first was its relationship with its labor force. In 2013 the Western Cape in particular experienced protests and strike actions. There has been a drift towards mechanization particularly in the crop production sector (North- West University, 2013). One of the consequences is a loss in specialized skills in the agricultural sector (this is dependent on the particular sub-sector and the skills involved). The second issue noted was that of land redistribution: the debate on how to take land redistribution forward has created uncertainty in the sector.

64.   The other problem noted relate to current issues on international trade agreements such as the uncertainty around the extension of the African Growth and Opportunity Act (AGOA) and the black spot in the citrus industry which has led to restrictions and possible bans from the EU.

Mining

Brief background

---

[18] In Table 4 we reported the METR for forestry and mining because the AFS does not report the asset structure for the agricultural sector.

65.   The mining sector plays a key role in South Africa's economy. South Africa accounts for over 30% of the global production of platinum group metals, ferrochromium and aluminosilicates and is a leading exporter of platinum, gold and vanadium.[19] While the overall share of direct mining activities in South Africa declined from 21% in 1970 to 7.5% in 2014 (in real GDP terms), minerals and products generated through beneficiation account for almost 60% of export revenue. Mining outputs are also critical to other sectors of the economy as can be seen from the example of coal which is critical for power generation and for the manufacturing and other sectors that require electricity.[20]

66.   Questions have been raised in recent times about the competitiveness of South Africa's mining sector in spite of its huge mineral deposits. During the commodity boom (2001 – 2008) fuelled largely by Chinese demand, the industry in South Africa contracted by 1 percent compared to an average annual growth rate of 5% in the top 20 mining exporting countries. Still the mining industry, through direct and indirect channels accounted for 18% of South Africa's GDP,[21] 1.35 million jobs and is by far the greatest earner of foreign exchange (50% or more of total earnings).[22] Other contributions noted by the industry to the South African economy include:[23]

- Accounts for 20% of private investment (12% of total investment)
- Attracts significant foreign savings (R1.4 trillion/ 29% of value of JSE).
- Significant contributor to transformation (>150 BEE deals concluded)
- 2012, R28 billion & R5 billion in royalties.
- Significant procurer of local goods and services (R389 billion)
- R93.6 billion spent in wages and salaries
- Significant contributor to infrastructure investment (50% of Transnet Rail Freight's business volume)
- 94% of electricity generation via coal power plants
- R4 billion spent on skills development
- R2 billion spent on community investment

---

[19]   Chamber of Mines Factsheet, August 2013.
[20]   Economic Tax Analysis: Mining Taxation: The South African Context, August 2013.
[21]   8% direct, 10% indirect & induced as to the Economic Tax Analysis: Mining Taxation: The South African Context, August 2013.
[22]   Economic Tax Analysis: Mining Taxation: The South African Context, August 2013.
[23]   Contribution made by the mining industry (Chamber of Mines) to the Davis Tax Commission.

Figure 7: FDI into Mining & quarrying
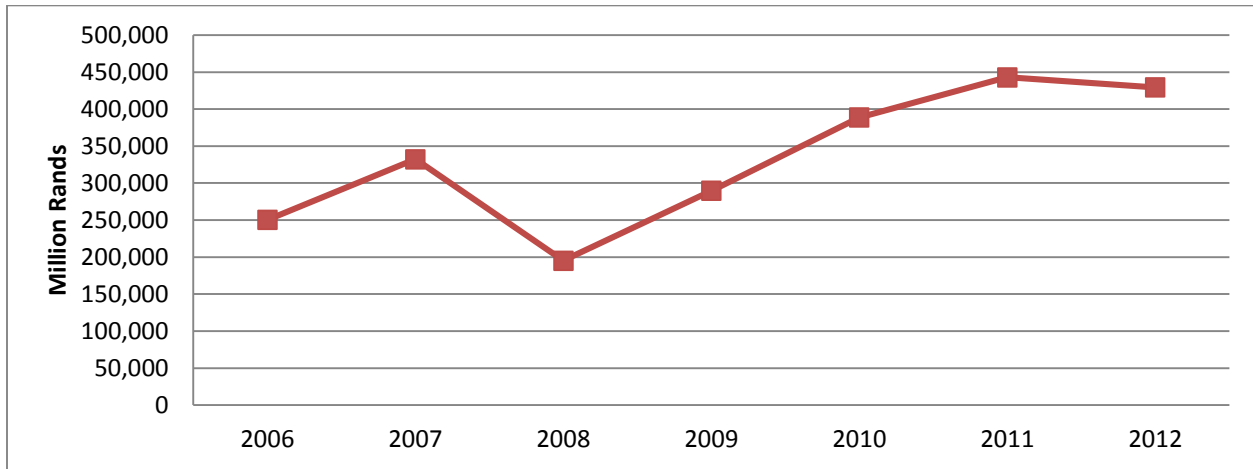
Source: SARB Quarterly Bulletin. Table S 98

67.   After a brief increase in FDI in South Africa's mining sector towards the end of the commodity boom, investment dropped quite sharply during the global financial crisis in 2008 (Figure 7). However, it has since grown smartly, with inflows levelling off only in the last year.

Taxation of the Mining Sector

68.   As was stated in the last METR study of South Africa, the vast majority of countries where mining contributes significantly to the economy have special tax regimes for mining companies, including different tax rates or different ways of recognizing income.[24] South Africa's tax regime for the mining industry may be summarily presented as follows (as summarized above in Tables 1 and 2):

Corporate Income Tax: Mining companies are subject to the prevailing corporate income tax rate of 28%. This rate does not apply to gold which is subject to a formula that was developed to encourage the mining of low grade ore (see Table 1).

Royalties: Royalties are calculated per a formula that takes into account EBIT for refined mineral resources (see Table 1) and unrefined mineral resources and caps the royalties at 5% and 7% respectively.[25]

Incentives: Mining companies may immediately (in the year in which they occur) deduct all mining related capital expenditures. The exemption also applies to other costs incurred in the pre-production period, such as management, administration, development, and interest. There is also a 5% straight line depreciation for buildings that is used to house employees.

---

[24]   This reflects the special status of mining in the economy such as: the disproportionately large share of national wealth that the mining sector may represent; the high risk and high capital intensity of mining; the complex legal and social provisions concerning ownership of mineral resources; the non-renewable character of mineral resources; and the employment that mining generates. All of these factors come into play in South Africa

[25]   See Section 4 of Mineral and Petroleum Resources Royalty Act of 2008

VAT: Zero rating of inputs into mine development

Ring-fencing: Mining companies are subjected to ring-fencing, which limits capital exemption to income from the mine at which the applicable capital expenditures were incurred. While this is a legitimate means to prevent profit shifting, the industry has said that it discourages further investment.

METRs for the Mining Sector

69.   Table 15 shows the METR for gold in the case of refined ore. Gold mining attracts a corporate tax rate that is based on a formula which is $45 - (225/x)$ % where x% is the ratio of the taxable income from gold mining to the total revenue (turnover) from gold mining. This implies that any gold mine that has this profitability ratio of less than 5% would essentially pay no tax. Table 13 uses x=30 which implies a corporate tax rate of 28.3% which is close to what is paid by the other sectors. The actual economy wide average value for x was not available for the gold mining industry.

Table 15: METR Analysis for mining – Gold

	Asset Value (R. mn)	Asset Weight	Economic Depreciation	Tax Depreciation (years straight line)	METR (refined Ore)
Land	267	0.4%			24.9%
Residential buildings	0	0.0%	5.9%	10	1.4%
Non-Residential Buildings	2276	3.1%	16.9%	10	3.2%
Construction Works, Roads and Parking areas	553	0.7%	8.6%	20	1.9%
Land improvements	0	0.0%			0.5%
Network equipment	0	0.0%	29.3%	5	5.0%
Computers and other IT Equipment	44	0.1%	25.9%	4	4.5%
Motor Vehicles and Other Transport equipment	120	0.2%	26.6%	4	4.6%
Other Property, Plant and equipment – Property	36247	48.8%	18.6%	5	3.4%
Other Property, Plant and equipment – Plant/Machinery	2996	4.0%	18.8%	8	3.5%
Capital work in progress	2106	2.8%	10.5%	13	2.2%
Other property, plant and equipment	26801	36.1%	23.9%	5	4.2%
Computer software	489	0.7%	44.0%	2	7.2%
Inventory	2306	3.1%		0	0.5%
TOTAL	74205	100.0%			3.7%

70.   Another factor that affects the METR is the royalty rate which is also based on a formula which differs for refined ores as well as unrefined ores. The royalty rate for refined ore is given by the formula 0.5 + {EBIT / (Gross sales x 12.5)} x100 where EBIT is the earnings before income tax. In the case of unrefined ores the royalty rate is higher and is given by the formula 0.5 + {EBIT / (Gross sales x 9)} x100. Further the royalty rates are capped at 5% and 7% for refined and

unrefined ores respectively. Table 16 shows the ratios of the EBIT/Turnover for the major mineral ores based on the data from AFS 2013 and the implied royalty rates. The determination of whether the ore is treated as refined or otherwise is based on Schedule 1 and Schedule 2 of the Mineral and Petroleum Resources Royalty Act 2009. Based on AFS 2013 the royalty rates vary from 0.5% for gold and uranium and 6.7% for iron ore. This results in an METR ranging from -19.7% for chrome to 31.9% for iron-ore (see Table 16).

Table 16: METRs for the Mining Sector (based on AFS 2013)

		EBIT/Turnover (X)	Royalty Rate(s) Refined = 0.5 + (X/9)*100; Unrefined = 0.5 + (X/12.5)*100	METR
Chrome	Unrefined	7%	0.7	-19.7%
Coal	Unrefined	0% (negative EBIT)	1.3	-16.2%
Other Ores incl. Mineral Sands	Unrefined	56%	2.0	-6.3%
Gold and Uranium	Refined	2%	0.5	3.7%
Platinum Group Metals	Refined & Unrefined	20%	0.5	3.9%
Manganese	Unrefined	0% (negative EBIT)	2.8	7.1%
Diamonds	Unrefined	14%	3.0	10.4%
Iron Ore	Unrefined	32%	6.7	31.9%

71.   The METR for iron-ore is the highest among all the sectors at 31.9%. It falls to -19.7% for chrome. The weighted average METR (weighted by turnover in 2013) for the whole sector is -1.2%, indicating that investment in the sector is subsidized. Two key drivers of the METRs are the royalty rates which neutralizes the impact of the 100% expensing of capital investments and the generous depreciation rate for buildings. If the royalty rates was 2.4%, the METR rises to 15.5% for gold and uranium. If the 100% expensing of plant and machinery were removed for coal, the METR would rise to 24.3%. Hence the full expensing of capital inputs plays an important role in moderating the overall tax burden on capital investment in the mining sector by heavily subsidizing investment in plant and machinery.

Table 17: Royalty Rates 2010-2013

	2013	2012	2011	2010
Coal	1.3	2.0	2.0	1.3
Gold	0.5	2.4	0.5	1.3
Iron Ore	6.7		6.3	5.8
Chrome	0.7		1.8	
Manganese	2.8	2.8	2.9	1.4
PGM (Refined/Unrefined)	0.5/0.5		2.1/2.8	
Other Ores incl. Mineral Sands	2.0		2.2	
Diamonds	4.0	2.8	4.8	3.7

72.   **The royalty rates have been volatile because of fluctuations in the profitability of the different mining operations.** Table 17 shows the royalty rates based on AFS 2010 to AFS 2013. In the case of gold, the royalty rate went to a maximum of 2.4% in 2012. In general the METRs in 2013 are lower than in prior years because of the lower royalty rates are driven by the lower profitability of the mining operations in 2013.

Key findings from interviews with industry representatives

73.   The potential for growth of the mining industry if constraints cited below are removed, according to the Chamber of Commerce,[3] – 5% per annum – a rate which will double the size of the industry in 15 years, create jobs both directly and indirectly, generate infrastructure and contribute significantly to growth.

74.   Although there is considerable opportunity to attract foreign direct investment into the mining sector, concerns raised by prospective investors were reported as follows:

- **Policy uncertainty:** Because it is very capital intensive, high risk and has very long lead times to productivity, the mining industry is particularly negatively impacted by policy uncertainty. This situation is compounded by the geographic limitations of the industry as well as susceptibility to cyclical commodity prices. Uncertainty is reported as having been sparked by the nationalization debate and by the threat of new taxes/statutory levies under a new Minerals and Petroleum Resources Development Act.

- **Lack of coherence in policy implementation:** Particular sources of concern have been the application of policies to encourage local manufacturing (diamond cutting and polishing) which have had the effect of harming the industry, as well as the interpretation of tax policy by SARS.

- **Lack of infrastructure:** Limited expansion of infrastructure, particularly of rail and power has limited the ability of the industry to grow. Although many offers have been made by the industry to participate in infrastructure development, such offers have not been taken up by the government.

- **Labor disruptions:** The frequent labor agitations, reportedly sustained largely by the absence of secret ballots in the determination of whether or not to embark on industrial action, have been very disruptive of mining operations and caused severe losses.

- **Proposed new taxes**: while not law, representatives are concerned about proposals to introduce carbon taxes, environmental levies, water/waste levies, non-statutory levies, and withholding taxes on supplies bought from multi-nationals

Tourism

Brief Background

South Africa's tourism industry has witnessed significant growth in recent years (Figure 8). The sector directly contributed 3% of total GDP in South Africa in 2013, or 9.5% of GDP when indirect effects are included.[26] According to the World Travel and Tourism Council, Benchmarking Travel and Tourism in South Africa (Nov 2013) its direct contribution to the economy is significantly higher than the automotive manufacturing and chemicals manufacturing sectors (Figure 9). South Africa welcomed a total of 9.6 million tourists in 2013, up from the 9.2 million in 2012. The number of visitors to South Africa, peaked at 14.9 million in 2013, a 10.5% increase in international foreign arrivals over 2012. Overseas tourist arrivals grew by 7.1%., visitors from Africa grew by 4%. Foreign Direct Investment into the sector has grown strongly, with the exception of 2013 (down 4.0% over 2012, to R73.2 billion, according to UNCTAD data). The travel and tourism is projected by its industry representatives to grow by about by 4.3 % p/a up to 2024.[27]

---

[26] The direct contribution of Travel & Tourism to GDP reflects the 'internal' spending on Travel & Tourism (total spending within a particular country on Travel & Tourism by residents and non-residents for business and leisure purposes) as well as government 'individual' spending - spending by government on Travel & Tourism services directly linked to visitors, such as cultural (e.g. museums) or recreational (e.g. national parks).

[27] The total contribution of Travel & Tourism includes its 'wider impacts' (i.e. the indirect and induced impacts) on the economy. The 'indirect' contribution includes the GDP and jobs supported by investment spending (includes investment activity such as the purchase of new aircraft and construction of new hotels); Government 'collective' spending (such as tourism marketing and promotion, aviation, administration, security services, resort area security services, resort area sanitation services, etc.); and domestic purchases of goods and services by the sectors dealing directly with tourists - including, for example, purchases of food and cleaning services by hotels, of fuel and catering services by airlines, and IT services by travel agents.

Figure 8: Growth in the Tourism Sector Relative to other Sectors

South Africa GDP Growth by Sector (1990=100)
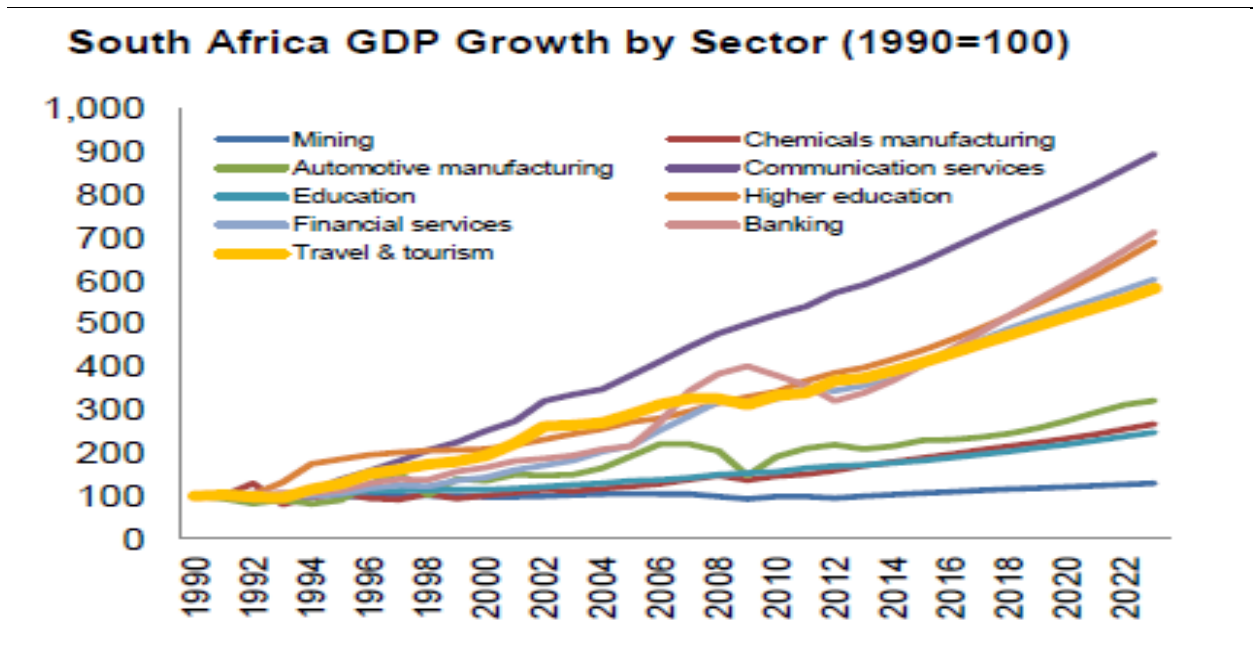
Source: Stats SA

75.   The sector's representatives notes that the following contributions of the industry to the South African economy as follows:[28]

▪   The industry sustained 10.3% of total employment in 2013. A total of 1.4 million direct, indirect, and induced jobs in South Africa.
▪   Travel & tourism in South Africa directly employs more people than most other sectors (banking, mining, communication services, automotive manufacturing, higher education, and chemicals manufacturing sectors).
▪   For every job directly in the travel & tourism sector, one additional job is created on an indirect or induced basis, making its linkages stronger than in the education sector.
▪   Travel & tourism GDP expanded by 200% between 1990 and 2013 while the total economy expanded just 74%. This growth exceeded that of the communication services, automotive manufacturing, education, chemicals manufacturing, and mining sectors.

---

[28]   World Travel and Tourism Council, Benchmarking Travel and Tourism in South Africa, Nov 2013.

Figure 9: Direct and Indirect Impact of the Tourism Sector Relative to Other Key Sectors
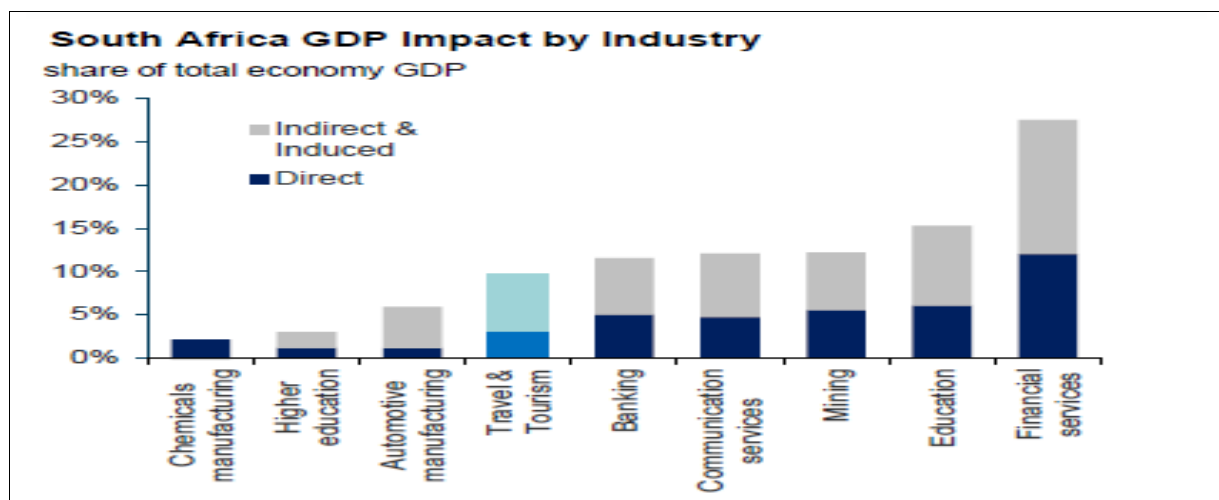
Source: The World Travel and Tourism Council, Benchmarking Travel and Tourism in South Africa, Nov 2013

Taxation of the Tourism Sector

76.   The tourism industry does not have any special incentive structure and is subject to prevalent tax rules of general application.

Tax Rate:

Corporate Income Tax: The sector is subject to the standard CIT rate of 28%.

Depreciation: Assets of companies in the travel and tourism industry are subject to normal asset-specific depreciation rules.

Tourism Support Program (TSP): Reimbursable cost sharing grants for investment in the tourism industry. The scheme, which ended in 2012 aimed to specifically promote sustainable job creation outside of the traditional tourism destinations of Durban, Cape Town and Johannesburg, as well as encouraging greater transformation in the sector

METRs for the Tourism Sector

77.   The METR for tourism at 6.1% is one of the lowest for all the sectors, apart from mining. This is primarily driven by the low METR for buildings and the fact that buildings comprise nearly 70% of the total asset basket of the sector. Further, the tax depreciation rate of 5% per year is nearly equal to the economic depreciation for hotels which is 5.5%. When combined with the deductibility of interest on debt that is used to pay for this asset this reduces the METR to 3.5%. Note that the average economic depreciation for tourism is 7.6% while the weighted average tax depreciation is 6.4% which is quite close. Plant and machinery for the tourism sector benefits from a 20% depreciation rate over five years. This also contributes to the low METRs for this sector.

Table 18: METRs for the Tourism Sector

	Asset Value (R. million)	Asset Weight	Economic Depreciation (%)	Tax Depreciation (years straight line)	METR
Land	1,338	4.8%			11.4%
Residential buildings	9,180	33.1%	5.5%	20	3.5%
Non-Residential Buildings	9,728	35.1%	5.5%	20	3.5%
Construction Works, Roads and Parking areas	1,428	5.2%	8.6%	20	18.8%
Land improvements	61	0.2%			-24.6%
Network equipment	5	0.0%	29.3%	5	25.6%
Computers and other IT Equipment	50	0.2%	47.0%	4	37.6%
Motor Vehicles and Other Transport equipment	148	0.5%	25.1%	5	19.4%
Plant, Machinery and other office equipment	4,826	17.4%	16.3%	5	2.2%
Capital work in progress	0	0.0%	19.6%	11	34.1%
Other property, plant and equipment	114	0.4%	19.6%	11	34.1%
Computer software	168	0.6%	40.3%	2	11.9%
Inventory	649	2.3%			35.5%
TOTAL	**27695**	**100.0%**			**6.1%**

Key findings from interviews with industry representatives

78. Concerns have been expressed by industry players about several non-tax issues that could jeopardize the goal set out in the National Development Plan to create 225 000 new jobs in this sector. These issues include:

- **New visa rules:** While the underlying rationale is sound, new visa rules that require in person applications for biometric visas and all children (and or their accompanying adults) entering or exiting South Africa to be in possession of a passport, an Unabridged Birth Certificate, and written permission from both parents or guardians of the child, (authorizing that child's travel) are seen as onerous terms that will lead to considerable paper work that could force tourists to seek other destinations in the sub-region or elsewhere.

- **Labor disruptions**: In common with other sectors of the economy, players in the sector as concerned about the impact of labor unrest of investment prospects as well as the broader impact on the economy.

Services

Brief background

79.   On account of its well developed and regulated banking system, financial services are among the key contributors to South Africa's GDP and the sector attracts significant foreign investment.[29] The 2012/2013 World Economic Forum's Competitiveness Survey ranks South African banks 2nd out of 144 countries for soundness, and ranks the country 3rd for financial sector development. Currently, the SA banking industry consists of 17 registered banks, 2 mutual banks, 12 local branches of foreign banks, and 41 foreign banks with approved local representative offices. The financial sector has attracted fairly significant FDI inflows – the most notable being the acquisition by Barclays, in 2005, of a majority stake in Absa for US$4.5 billion; and the purchase by the Industrial and Commercial Bank of China of a 20% stake in Standard Bank in 2007 (for US$5.5 billion).

80.   The financial sector in South Africa comprises over R6 trillion in assets (banking sector assets represent just over half), contributing 10.5% of the gross domestic product of the economy annually, employing 3.9% of the employed (approximately 150,000 people), and contributing at least 15% of corporate income tax collections.[30] Since 2000, the sector has grown at an annual rate of 9.1%. Growth in employment rose over the same period by 24.5%, one of the fastest-growing employers in South Africa. The total assets of the sector have also grown significantly, registering nominal compound average growth of 12.3% between 2000 and 2010.

Taxation of the Services Sector

81.   The financial sector does not have any special incentive structure and is subject to prevalent tax rules of general application.

Tax Rate:

Corporate Income Tax: Actors in the industry are subject to the CIT rate of 28%, with taxes on capital gains, interest and dividends being 19%, 15% and 15% respectively.

Depreciation: Assets of companies in the Financial Services industry are subject to normal asset-specific depreciation rules of 5% for buildings and 20% for equipment (straight line).

---

[29] Legislation affecting the banking industry includes, amongst others: the Banks Act; the National Payment System Act; the Financial Intelligence Centre Act (FICA); the Financial Intermediary and Advisory Services Act (FAIS); the National Credit Act; the Consumer Protection Act; the Home Loan and Mortgage Disclosure Act; and, the Competition Act. Banks in South Africa are subject also to the King Code on Corporate Governance and Basel III (except for the 2 mutual banks) as well as various ombudsmen who provide the industry with quick, fair, impartial and effective dispute resolution.

[30] See A Safer financial Sector to serve South Africa Better, 2011 (National Treasury Policy Document)

VAT: Most financial services are VAT exempt.

METRs for the Financial Sector and Services sector

82.   As detailed asset breakdown for the financial sector was not provided in the AFS 2013, the METRs for the financial sector to be calculated using the current tax regime but with the asset weights used for the 2006 report. The additional tax factor to consider in the financial sector is the impact of VAT exemption on part of the activities of the financial sector. We assume that 25% of the activities are related to VAT exempt services. This means that taxes paid on inputs that relate to such activities cannot get the benefit of input tax credit for purposes of VAT. This implies an implicit sales tax on inputs. Table 19 shows the METR for the financial sector is 24.9% is higher than that for the highest sector in Table 4, the electricity sector. The higher METR for the financial sector relative to other sectors as a result of VAT exemption is not an unusual feature of the tax system.

Table 19: METRs for the Financial Sector

Asset type	METR Rate
METR Equipment	39.8%
METR Building	20.1%
METR Land	-26.5%
METR Inventory	35.5%
METR Total	24.9%

METRs for the Services sector (activities auxiliary to financial intermediation, real estate and other business services)

83.   The METR for the services sector of 14% is the third lowest after mining and the tourism sectors. This is despite the fact that the services sector does not benefit from any special tax incentives. The tax depreciation is the same as the economic depreciation making the depreciation rates neutral for this sector (Table 20). The low weight of inventory in the asset basket as well as the higher contribution of buildings reduces the overall METR.

Table 20: METRs for the Services Sector

	Asset Value (R. million)	Asset Weight	Economic Depreciation	Tax Depreciation (years straight line)	METR
Land	27540	13%			11.4%
Residential buildings	8583	4%	6%	20	3.5%
Non-Residential Buildings	93544	43%	6%	20	3.5%
Construction Works, Roads and Parking areas	9891	5%	9%	20	18.8%
Land improvements	0	0%			11.4%
Network equipment	4559	2%	29%	5	25.6%
Computers and other IT Equipment	4711	2%	47%	4	37.6%
Motor Vehicles and Other Transport equipment	16754	8%	25%	5	19.4%
Plant, Machinery and other office equipment	20547	10%	19%	5	10.1%
Capital work in progress	1321	1%	20%	11	34.9%
Other property, plant and equipment	3198	1%	20%	11	34.9%
Computer software	3570	2%	40%	2	11.9%
Inventory	21761	10%			35.5%
TOTAL	**215979**	**100%**			**14.0%**

Key findings from interviews with industry representatives

84.   Interviews with representatives of the sector highlighted the following key challenges, for the sector that lie largely outside the current tax system that applies to it:

- **Policy uncertainty:** The introduction of domestic legislation such as the Expropriation Bill and the introduction of the Spatial Planning and Land Use Management Act in 2013 may create additional uncertainty in the already-difficult mortgage market segment.

- **High cost of tax compliance and other regulation:** Industry representatives expressed concern about the high cost of regulation and the cost of compliance with the tax regime. These, they said had largely been occasioned by mistrust between banks and

revenue authorities which had been alleviated somewhat by the signing of a Code to establish relative positions.[31]

- **Labor disruptions:** Although labor in the sector has not undertaken any strikes, sector representatives noted their concern about the debilitating impact of labor unrest to the country's economy. They expressed the hope that current disruptions in other sectors would not generate a culture that would filter into other sectors.

- **Public perceptions:** Industry representatives also noted with some concern recent statements in the media that banks in South Africa are undertaxed. They said that uncertainty around tax rates in the near future was proving to be a disincentive for investment in the sector.

Conclusions and Recommendations for the detailed sector analysis

85.   The following conclusions flow from the sector-level analysis conducted above:

- The very generous 12I investment allowances provided to qualified manufacturing investments over and above the 'standard" accelerated depreciation allowances results in highly negative METRs and indicates that these investments are heavily subsidized. They could be moderated to reduce the possibility of allowing deductions over the lifetime of the asset of up to 200% of the value of the investments. The 12E incentive that provides a 100% capital allowance for investment undertaken by SMEs results in a more subsidy to these investments in part because inventories still comprise a large share of the asset portfolio of the SME sector and suffer from the cost of FIFO in the context of inflation.

- Lower tax rates for investments made in SEZs are being debated. As is always a risk, this has the potential of undermining revenue with possibly limited impact on investment. This is primarily because there is an incentive for investments to relocate inside the SEZs to take advantage of the lower tax rates. Investments within the SEZs would out-compete those outside resulting in the later losing competitiveness investments purely because of tax considerations.

- Capital investment in the mining sector is heavily subsidized as the sector receives generous tax treatment. The 100% or full expensing of capital investments in the first year generates a significant tax advantage for the sector, not to mention a lot of variation in the METRs across ores due to difference in actual asset profiles. By way of contrast, for most other sectors outside mining, the capital investment allowances are overall positive to neutral for investment, with tax depreciation rates higher than economic depreciation rates in most cases/sectors. Even in the sectors where it is lower, the tax and economic deprecation rates are quite close to each other. The question arises whether the capital

---

[31]   Industry representatives noted that the Financial Sector Regulation Bill formalizes the separation of prudential regulation and market conduct regulation and expressed the hope that this would reduce the costs of regulation and improve regulatory efficiency.

investment allowances in mining should be bought closer in line with other sectors, like manufacturing.

- The analysis also revealed that even in sectors where there are no specific tax incentives or preferential depreciation schedule, the ability to deduct interest provides considerable tax relief. This was most evident in tourism, a sector that receives no incentives but is highly leveraged and holds most of its assets mainly in buildings.[32]

- A detailed analysis of the non-tax incentives administered by the DTI (such as cash grants and customs duty exemptions that are available to the automotive industry, or those available for Research & Development (R&D) or the Manufacturing Competitiveness Enhancement Program, MCEP) was beyond the scope of this paper due to lack of available data at the firm level of customs duty exemptions and other financial incentives. Data on these incentives would be needed to obtain a full picture of the impact of all incentives offered on the tax burden face by the manufacturing and other sectors. We encourage NT, DTI and SARs to compile a comprehensive and unified database to track and monitor all incentives offered. This would create an evidence base to facilitate more regular and fuller analysis of incentives to ensure they are achieving their goals.

- In most sectors, our interviews with sectoral players suggested that tax policy issues were not a key concern or constraint on investment. The more common concerns across all sectors include issues relating to labor relations, policy uncertainty and power supply. These business climate issues were the primary concern.

---

[32] One point to note that this is debt-asset ratio and not debt-equity ratio which would be lower.

ANNEX 1: The Terms of Reference for 2014 Study of Marginal Effective Tax Rates

The Terms of Reference agreed with the Davis Tax commission included to:

- **Calculate the METRs** in the sectors covered by the study and also benchmark it against selected comparator countries.
  - o The METRs will be calculated for the principal sectors (example, Agriculture, Manufacturing, Tourism and Services) based on a desk review of these sectors. However, the team shall do field work and in-depth analysis of the Manufacturing sector.
- **Analyze the results of the METR analysis** and their implication on tax and incentive policies.
- In addition to these and conditional on the availability of the tax return data, the team will **analyze the impact of the tax incentives on investment using tax return data**.
- **Assess the strengths and weaknesses of tax policy** and the implications for attracting FDI, comparing the country with competing locations for FDI as relevant such as Brazil, India, South Africa, Russia, etc.
- Conduct **a capacity building exercise** with the local counterpart team; transferring knowledge on what METR analysis is used for, how to use it, and how to interpret the results. This could be done through a formal workshop and through participation of identified counterpart team members in construction of the analysis.

In order to complete this,

- The team will include an academic from University of Stellenbosch with the University covering all related time, travel, hotel and per diem costs
- The team may also include staff members from SARS and the National Treasury which shall cover on its own all related time, travel, hotel and per diem costs
- The team shall **conduct in-depth field studies** including meetings with the tax and sector experts (**mainly the manufacturing sector**).
- The team shall **meet with the private sector, both national and foreign**, documenting the tax policy and tax administration constraints to growth
- The team will be bound by confidentiality clauses of the World Bank Group

ANNEX 2: The Theory of Marginal Effective Tax Rates and Average Effective Tax Rates
(source: Peter Birch Sorensen 2008 – Estimating Effective Tax Rates on Corporate Income, Department of Economics, University of Copenhagan)

If A Corporate Firm investing $1 in a real asset and
-     it depreciates at the exponential rate of δ
-     The firm's discount rate is ρ
-     *The net rate of return before tax is r*
-     *The corporate tax rate is u*

1) $r + \delta$ is the profit maximizing return on a unit investment which is got by using the profit maximization condition, i.e. Profit = F(K) − rK- δK, and hence $\frac{\partial Profit}{\partial K} = 0$, implies F'(K)$= (r + \delta)$, i.e. the return from a unit investment $= r + \delta$.

2) The value of the investment that depreciates exponentially at the rate δ at time t is given by $e^{-(\delta)t}$ [evaluating $\lim_{\Delta t \to 0} (1 - \delta\Delta t)^{(\frac{t}{\Delta t})}$ where the expression in brackets is the value of the investment remaining at time t i.e. after n time periods $= \left(\frac{t}{\Delta t}\right)$].

3) Exponential discounting in continuous time gives $e^{-(\rho)t}$.

Putting 1), 2) and 3) together, we have a unit investment that returns $r + \delta$. However, this investment loses value at the exponential rate of δ (i.e. its value at time t will be $e^{-(\delta)t}$. Hence the return from the investment at any point t for a duration of dt is given by
$(r + \delta)e^{-(\delta)t}\, dt$.

If u is the corporate tax rate, the tax paid on this return is equal to
$u(r + \delta)e^{-(\delta)t}\, dt$.

The present value of this return discounted at an exponential rate of ρ is given by
$u(r + \delta)e^{-(\delta)t}\, e^{-(\rho)t}dt$.

With taxes however the investment will benefit from a depreciation or capital allowance deductions. Putting these together,
The Net Present Value of the Corporate Tax collected over the lifetime of the asset is given by

$$NPVT = \int_0^\infty u(r + \delta)e^{-(\rho+\delta)t}\, dt - uZ$$
$$= \frac{u(r + \delta)}{\rho + \delta} - uZ$$

Where τZ is the present value of future reduction in tax due to all the deductions from the corporate tax base associated with the investment (i.e. the capital or depreciation allowances).

The expression Z can be calculated easily both in discrete as well as continuous time.
In continuous time and under exponential discounting, If the tax system allow depreciates at the exponential rate of ϕ
The Present Value of the future reduction in tax due to all the deductions is given by

$$uZ = u \int_0^\infty \phi e^{-(\rho+\phi)t} \, dt \;=\; \frac{u\phi}{\rho + \phi}$$

In discrete time,
Consider a $1 capital expenditure with initial investment allowance at the rate θ and a declining balance depreciation on the balance at the rate ϕ
Flow of deductions in discrete time

Year	Deduction	Undepreciated Capital Cost
1	$\theta+(1-\theta)\,\phi$	$(1-\theta)(1-\phi)$
2	$\delta(1-\theta)(1-\phi)$	$(1-\theta)(1-\phi)(1-\phi)= (1-\theta)(1-\phi)^2$
3	$\phi(1-\theta)(1-\phi)^2$	$(1-\theta)(1-\phi)^3$
4	. . .	. . .

The *present discounted value* of the allowance and the depreciation deductions on the $1 expenditure is:

$uZ = \theta +(1-\theta)\{\phi + \phi (1-\phi)/(1+\rho)$
$+ \phi (1-\phi)^2/(1+ \rho)^2 + \ldots\}$
$uZ = \theta + (1-\theta) \phi /(\rho +\phi)$

When $\theta=0$, the value of Z is the same as the expression in the case of continuous discounting, i.e.

$$uZ = \frac{u\phi}{\rho + \phi}$$

We have the expression to compute the Net Present Value of the taxes paid. In order to calculate the Effective tax rate we need to have an expression of the income. The income is calculated in the manner similar to the discussion above except that the income accruing to the investor is net of depreciation (while the tax is paid on the entire return).

The investment will generate a flow of pre-tax income which is given by

$$NPV = \int_0^\infty re^{-(\rho+\delta)t}\, dt = \frac{r}{\rho+\delta}$$

The forward looking measure of the Average Effective Tax Rate is given by

$$AETR^f = \frac{NPVT}{NPV}$$

$$= \frac{(u-uZ)(\rho+\delta) + u(r-\rho)}{r}$$

One can verify that when the tax depreciation is equal to the economic depreciation, i.e. $\phi = \delta$, $AETR^f = u$ the corporate tax rate.

And when $\phi \neq \tau$, the AETR will deviate from the statutory rate

AETR may be calculated for any value of the pre-tax rate of return 'r'

Of particular interest is the tax on the marginal investment project (with a net-of-tax value equal to zero)

The marginal investment can be understood as follows:-

Ignoring taxes, all investments that earn a rate of return in excess of a minimum required hurdle rate of return will be undertaken. Investments that earn more than the hurdle rate of return are said to earn *economic profits* .The very last investment project undertaken just breaks even in the sense that it earns the hurdle rate of return exactly is called the *marginal* investment

Gross of tax and depreciation, the present value of the return from an extra unit of investment is given by,

$$PVG = \frac{r+\delta}{\rho+\delta}$$

(this is because $(r+\delta)$ is the profit maximizing return on investment which is got by using the profit maximization condition, i.e when Profit = F(K) – rK- δK, hence F'(K) = $(r+\delta)$ as above)

By the definition of the Marginal Investment,

$$PVG - NPVT - 1 = 0$$

return less expenses [i.e. tax (NPVT) plus investment ($1)] = 0

 Hence,

$$\frac{(1-u)(r+\delta)}{(\rho+\delta)} = 1 - uZ$$

Hence, the required before tax rate of return on the Marginal Investment is given by

$$\hat{r} = \frac{(1-uZ)(\rho+\delta)}{(1-u)} - \delta$$

This expression is also known as the User Cost of Capital and can be derived by maximizing the Value of a firm Jorgenson (1963) and Hall and Jorgenson (1967).

Sticking this return $\hat{r}$ into the definition of effective tax rate for r we used earlier

$$AETR^f = \frac{NPVT}{NPV}$$

$$= \frac{(u - uZ)(\rho + \delta) + u(r - \rho)}{r}$$

We obtain,

$$METR^f = \frac{(u - uZ)(\rho + \delta)}{(1 - u)\hat{r}}$$

And in another form,

$$\boldsymbol{METR^f = \frac{\hat{r} - \rho}{\hat{r}}}$$

Which implies that the $METR^f$ is the difference between the before-tax and after-tax rate of return measured relative to the before tax return

Consider the case when the tax system allows investments to be expensed fully,
i.e. $\phi \to \infty$, hence Z=1, substituting into the expression for METR

$$METR^f = \frac{(u - uZ)(\rho + \delta)}{(1 - u)\hat{r}}$$

Gives $METR^f = 0$
Which implies that under a cash flow tax when investment is completely expensed, the METR = 0.
Substituting ,

$$METR^f = \frac{(u - uZ)(\rho + \delta)}{(1 - \tau)\hat{r}}$$

into the expression for

$$AETR^f = \frac{(u - uZ)(\rho + \delta) + u(r - \rho)}{r}$$

Gives,

$$AETR^f = \left(\frac{\hat{r}}{r}\right) METR^f + \left(1 - \frac{\hat{r}}{r}\right) u$$

Which is an intuitive expression that indicates the relative importance of these two measures
For the marginal investment project where $\hat{r} = r$, we have the
$AETR^f = METR^f$, but for projects with very high rates of returns, $\hat{r} \gg r$, the $AETR^f$ approaches the corporate tax rate.

ANNEX 3: METRs for Capital and Labor

Source: Duanjie Chen and Jack Mintz. 2013. Annual Global Tax Competitiveness Ranking: Corporate Tax Policy at a Crossroads. The School of Public Policy, University of Calgary.

Based on the foundation developed in ANNEX 1, the METRs can be calculated for different kinds of capital (Land, Building, Equipment and Inventory) using different kinds of financing (debt and equity) and also including other factors of production including Labor.

From Annex 1 we have

$$METR^f = \frac{\hat{r} - \rho}{\hat{r}}$$

Where $\hat{r}$ is the required before tax is rate of return on the Marginal Investment (Gross-of-tax rate of return on Capital) and ρ is the firm's discount rate which is taken to be net-of-tax rate of return on capital for the owners of the firm given by the expression

$$\rho = \beta i + (1-\beta)e - \pi$$

where i is the interest rate on debt and e is the rate of return on equity, β is the proportion of the investment financed by debt and π is the inflation rate.

The required rate of return for owner of capital is different from the cost of financing for the firm because firms are allowed to deduct interest payments that are financed by debt. Hence,

$$\hat{r} = \frac{(1 - uZ)(\rho_f + \delta)}{(1 - u)} - \delta$$

where $\rho_f = \beta i(1-u) + (1-\beta)e - \pi$, reflecting that the cost of debt will now be lower as it is deductible and hence reduces the corporate tax payable.

Gross of Tax Rate of Return on Capital

The Gross of tax rate of return on capital is given by

$$\hat{r} = (1 + t_c)(1 - ITC)\frac{(1 - uZ)(\rho_f + \delta)}{(1 - u)(1 - t_p - t_s)} - \delta$$

Where t_c the tax on capital inputs such as a tax on transfer of property, import duty on capital equipment, etc. t_p is the property tax rate and t_s is a tax on gross receipts such as a sales tax and ITC is the Income Tax Credit rate which is the percentage of capital invested that is allowed to be deducted out of the tax paid.

Z is the present value of the depreciation benefits which is equal to $\frac{\phi}{\rho+\phi}$ where ϕ is the depreciation rate for the capital for tax purposes (as shown in Annex 1). In the case of straight-line depreciation Z is calculated using the present value of equal parts of the capital being allowed to depreciate as follows:-

$$Z = \sum_{i=1}^{\frac{1}{\phi}} \left(\frac{\phi}{(1+\rho)^i}\right)$$, hence if ϕ=5% straight line, then the summation is carried for 20 years with 5% of the capital being allowed depreciated each year for tax purposes.

Gross of Tax Rate of Return on Inventory

For Inventory the method of accounting for it affects the gross rate of return. If inventory is depreciated by the FIFO (First In First Out)accounting method, then the value of sale out of the inventory is higher because of inflation during the intervening years and there is essentially a tax on inflation that is borne by the firm. In such a case the Gross of tax rate of return on invensory is given by

$$\hat{r} = \frac{(\rho_f + u\pi\zeta)}{(1-u)(1-t_p-t_s)}$$

Where ζ=1 if the FIFO accounting is used and Where ζ=0 if LIFO (Last In First Out) method is used.

Gross of Tax Rate of Return on Land

For Land which does not depreciate but bears taxes such as the property tax and the land transfer tax, the Gross of tax rate of return is given by

$$\hat{r} = (1+t_c)\frac{\rho_f}{(1-u)(1-t_p-t_s)}$$

METR on Labor

For the Marginal cost of labor we assume that the firm bears the taxes on labor such as the payroll taxes, social security contributions, etc. that it pays to the government. In such a case the Marginal cost of labor is the taxes borne on the incremental labor which is the tax burden on the average wage of a worker.

Composite METR on the Costs of Production

Based on Makenzie, Mintz and Scharf (1997), the overall METR on production assuming a Cobb-Doublas production function is given by the expression,

$$\hat{r} = \left[(1 + METR_l)^{\delta l}(1 + METR_k)^{\delta k} \right] - 1$$

Where $METR_l$ is the METR for Labor, $METR_k$ is the METR on Capital, and δl and δk are the factor shares of Labor and Capital respectively.