THE IMPACT OF TAX INCENTIVES TO STIMULATE INVESTMENT IN SOUTH AFRICA

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Few if any contemporary public economists of note laud the virtue of tax incentives. On the contrary, the general line is to warn against them. Bird (2008: 9) states as follows: "Despite their continuing popularity almost everywhere, tax incentives are usually redundant and ineffective: they reduce and complicate the fiscal system without achieving their stated objectives. Even to the limited extent that some incentives are effective in inducing investors to behave differently than they would have done in response to market signals, the result is often inefficient, diverting scarce resources into less than optimal uses." Zee, Stotsky and Ley (2002: 1497) observe that the use of tax incentives is widespread even though the available empirical evidence on the cost-effectiveness of such incentives in stimulating investment is highly inconclusive. An FIAS (2001) report on incentives in Indonesia find little evidence of success in luring investment via incentives—at least without very high costs.

There is evidence to the contrary as well. Incentives aimed explicitly at increasing foreign direct investment are used throughout the world. And there is some evidence of their impact. De Mooij and Ederveen (2003) find that the elasticity of foreign direct capital stock with respect to changes in the cost of capital is greater than one in developed countries. Klemm and Van Parys (2009) make a distinction between tax rate differentials and other incentives and find that the latter have some impact on investment but they do not conclude that they have a discernable impact on economic growth.

No matter the evidence, tax incentives continue to drive much of the tax policy in developing and developed countries and there are myriad examples. Competitive tax incentives between countries in a region are often the order of the day (Keen & Mansour, 2009). For example: tax incentives are a central part of Rwanda's economic development plan (UNCTAD 2006; FIAS 2006a); in April 2011 Uganda's tax exemptions led the IMF to call for their elimination to broaden tax bases (IMF, 2011); and South Africa has a substantial number of incentives that reach manufacturing, tourism, and mining among other industries (FIAS, 2006b; IMF, 2008; Deloitte, 2009). Even within countries, such as the U.S., states (subnational governments) find themselves "at war" with one another over the attraction of businesses through incentives (for a practical example, see Wisconsin Legislative Reference Bureau, 2006).

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While the impact of tax incentives on economic growth has been the focus of a large amount of theoretical and empirical research in developed nations, the question of their impact remains elusive. In developing nations, the empirical evidence of the impact of tax incentives is growing but the answers are at least as, if not more, elusive. The dearth of evidence is particularly troublesome when these countries experiment with a wide variety of incentives. What are the goals of these incentives? Are these incentives effective? Are there distributional implications of incentives that may be counterproductive or enhance first round impacts? What is the cost-benefit associated with their use? How can we evaluate them?

The purpose of this paper is, very generally, to provide a framework and potential methodology of analysis of tax incentives in one country — South Africa. As incentives are specific and often very targeted, the precise methods needed to analyze the effectiveness of incentives may well differ among types of incentives. However, by positing a framework for evaluation based on basic economic principles, we believe that transparency, accountability and rigorous evaluation of individual incentives or regarding the choice of incentives may be enhanced.

We choose the case of South Africa as one where tax incentives have been widely used and for which data are more readily available than in many other sub-Saharan African countries. Our focus is on developing a reasonable way to identify and classify incentives so as to reduce the apples-to-oranges comparison syndrome (which may provide cover for a lack of analysis), positing a hierarchy of incentives based on their likely efficiency enhancing (or efficiency diminishing) properties, and providing a means to evaluate the potential macroeconomic effectiveness of these policies up front, which also provides a means to evaluate the policies *ex post*. The importance of establishing evidence for policies such as tax incentives cannot be overstated – too often policies march forward with little consideration of the cost-benefit and opportunity cost of specific policy interventions. Using known tools including Input-Output (Supply-Use) tables and analysis, Social Accounting Matrices, and resulting multipliers and relying on previous research, we provide a framework to compare alternative incentives *ex ante*. These tools are also used in computable general equilibrium models, but we suggest that full blown CGE models may not be the most transparent tool to evaluate the subtleties of targeted tax incentives, which many countries use. CGE models are becoming increasingly detailed and disaggregated, but often do not incorporate the sector specificity found in I-O models.

Section 1 raises definitional issues and summarizes economic effects of a variety of tax incentives. Section 2 provides a brief overview of the literature. In Section 3 a classification is presented of tax incentives as instruments to promote direct fixed investment, with reference to differences of acceptability and incidence in South Africa. In Section 4 we estimate the effect of tax incentives, and section 5 considers alternatives to tax incentives. Section 6 concludes.

1. Economics of Tax Incentives

Tax incentives come in many forms. Incentives may relieve tax liabilities completely (tax holidays), partially, provide preferred rates, deductions, exemptions and may fall on one tax or many. Incentives are given by central governments as well as subnational governments. Incentives may be very localized with the expectation of generating investment in one region of a country or may be developed with the expectation of increasing investment (foreign and domestic) at large. In section 3 below, we present a means of categorizing incentives.

Whatever the form of tax incentive, the economics are relatively straightforward. In the case of incentives focused on investment (many of the incentives employed through the corporate income tax or taxes on capital income), the user cost of capital concept (UCC) (the price of capital) demonstrates that tax incentives may work to reduce the cost of capital directly or indirectly, thereby increasing investment. The precise definition of the UCC is affected by the level of detail, but a basic construct is that found in Hall and Jorgensen (1967):

q = purchase price of 1 unit of K

δ = proportionate depreciation rate of K

$q*\delta$ = depreciation in one period for K worth q per unit

r = cost of financing per dollar of financing

$q*r$ = cost of financing per unit of K

$-\Delta q$ = change in value of capital (loss)

$UCC = q (r + \delta - g)$ where $g = \Delta q / q$

Profits are maximized when capital is hired to the point that the value of the marginal product of capital ($P*MP_k$) is equal to the user cost. Factors such as tax rates, depreciation and treatment of capital gains, tax holidays, and subsidized interest rates affect the UCC and thereby the level of investment. A similar model might be derived for labor which demonstrates that tax incentives aimed at reducing the cost of labor would potentially increase hiring.

Other incentives could reduce other variable costs such as transportation, thus reducing the marginal cost of production. Again, under such a scenario, a profit maximizing firm would then be able to increase the amount of output. Some incentives reduce fixed costs including the costs of doing business (licensing, permitting, making tax payments, etc.). A reduction of these costs may reduce the threshold for new firms entering and thereby expand investment and production.

These stylized models are admittedly simple, but demonstrate the potential impact of tax incentives and the notion that they can be modeled within a relatively standard market framework. In the "real world" complications arise due to competing policies, substitutability between capital and other inputs, impact of long-term incentives, competition from other countries, etc. Besides, the economic incidence differs from the statutory incidence. These complications can mitigate or exacerbate the impact of incentives in any one country.

We submit that, if the incentive is substantial, a CGE approach may be used to analyze the potential impact. There is no golden rule regarding when a CGE model is an appropriate tool of analysis, but many tax incentives are small relative to the size of the economy and in many cases, CGE models will not include detailed sectors to deal with specific incentives. This is not true in the case of broad incentives including a reduction in the corporate income tax.

Many countries target tax incentives to a specific industry as a means to develop new industries or revive older industries. As a result, in the short run, the UCC in one industry may be heavily subsidized by tax increases in other industries (or on other factors), creating a competitive advantage in the short run. Depending on the mobility of factors of production, we would expect that the net rates of return to all factors would eventually equilibrate or tend to converge. As a result, the competitive advantage of the original incentive may be mitigated (or enhanced) depending on the structure of the economy, factor mobility and substitution and the like, a la Harberger's general equilibrium corporate tax incidence analysis.

2. Views on tax incentives

We distinguish between general and selective investment tax incentives. General tax incentives refer to incentives applying across the board, and with no exception, to all tax payers, such as a reduction in the corporate tax rate or universal depreciation allowances. Selective investment tax incentives is defined as a selective deviation from the benchmark tax, i.e. the standard tax provision as legislated and which is suspended or changed to benefit a select group of taxpayers. Along which Zee, Stotsky and Ley (2002: 1498) we distinguish, with reference to investment, between a statutory and an economic tax incentive. The former is defined as "a special tax provision granted to qualified investment projects (however determined) that represents a statutorily favourable deviation from a corresponding provision applicable to investment projects in general (i.e. projects that receive no special tax provision)." The latter is defined as "a special tax provision granted to qualified investment projects that has the effect of lowering the effective tax burden – measured in some way – on those projects, relative to the effective tax burden that would be borne by the investors in the absence of the special tax provision." Together, general and special tax incentives represent total tax expenditure, although a reduction in corporate tax

rates would not be regarded as a tax expenditure.[2] Our focus is on incentives focused on encouraging investment in the home country. The real impact depends on the economic and not the statutory incidence of the benefit.

Tax incentives which are directed at business activities are aimed at real investment in productive activities rather than investment in financial assets and often directed to foreign investors. They are supposed to supplement insufficient domestic capital for the desired level of economic development in specific sectors or across the board. The accompanying modern technology and management techniques are viewed as an important side-benefit, and in some instances technology transfer is a key objective of incentives (United Nations, 2000) – the positive externality argument. Developing and transition countries have introduced investment incentives for varying reasons. In some cases, especially in transition countries that have not reformed the socialist tax system, incentives were seen as counterweight to investment disincentives inherent in the general tax system. In other countries, they have been introduced to offset other disadvantages investors may face, e.g. lack of infrastructure, complicated and antiquated laws, bureaucratic complexities and weak administration in the area of tax or elsewhere. Sometimes they were introduced to keep up with other countries in competing for international investment, a kind of 'race to the bottom' in effective corporate tax rates. Although tax incentives might be justified as temporary measures until more deep-seated deficiencies have been removed, there are countries where such incentives were actually introduced or maintained even after deficiencies in law and administration had been remedied (Holland & Vann, 1998: 987).

Why are many economists and fiscal authorities at best lukewarm about tax incentives? These incentives distort preferences and allocative efficiency. They are criticised because they imply that government officials are better able than private investors to decide the best types and means of production, which would be necessary if economic performance is to be improved. This amounts to a criticism of any 'picking-winners' industrial strategy. The criticism is also based on empirical evidence that the investment decision is determined by more than tax-related considerations, that is, nontax-related economic considerations, noneconomic considerations and social policy considerations. A first best approach would be to address impediments at source and not through tax incentives.[3] Further, tax incentives create tax-driven businesses, which are not eventually economically sustainable. In fact, a vested interest is created in their perpetuation, which makes them very difficult to abolish. From a fiscal point of view, the real cost is hidden and the tax base is eroded. The growing

[2] For an outline of definitional issues, see OECD (2010).

[3] Supporters of tax incentives will often forward the argument of incubators for new businesses in which the barriers to entry are quite high due to technology, information, etc. In some cases, these market-failure barriers to entry may be mitigated by government supported research and development, regulations on monopolies, etc. Tax incentives to support specific industries are more of a blunt instrument that may also benefit other industries. In the end, the question remains – can the new industry be sustained without additional policy interference?

call for tax expenditures budgets may be a reflection of the institutionalized nature of tax incentives and other changes in tax systems over the years.

Often the non-transparent character of incentives facilitates tax evasion, complicates tax administration and encourages rent-seeking behaviour and corruption. Most incentives do not reach entities unless profit is made; companies with initial high layout cost do not qualify unless excess tax credits can be sold to profitable companies (a growing policy option in some industry incentives in the U.S.). Empirical research indicate that tax incentives can stimulate investment, but that a country's overall economic characteristics may be more important for the success or the failure of industries than any tax incentives package (Zee, Stotsky & Ley, 2001:1509). Even if tax incentives stimulate investment, they are not generally cost effective.

The limited usefulness of tax incentives derives also from the fact that investors often emphasise the relative unimportance of the tax system in investment decisions compared with other considerations (Holland & Vann, 1998: 987). Evidence is that firms first examine a country's basic economic and institutional situation and are basically attracted to the potential markets in developing and transition countries and the relatively low-cost labour. Factors inhibiting large-scale investment and for which tax incentives can't compensate include uncertainty in the policy stance of governments, political instability and the rudimentary state of the legal framework for a market economy (in transition economies). Tax incentives on their own cannot overcome these negative factors and the general features of the tax system (tax base, tax rates, stability, consistency/predictability, transparency, etc.) are more important than tax incentives. (Klemm & Van Parys, 2009; James, 2009; McKinsey Global Institute, 2003).

Why do countries enact tax incentives despite their drawbacks? Legislators may feel the need to do something to attract investment but may find it difficult to address the chief reasons that discourage investment. Tax incentives are at least something over which they have control and which they can enact relatively easily and quickly, precisely because the full cost is not always visible or disclosed. Alternatives to tax incentives may also involve direct expenditure of funds, and tax incentives may be seen as a politically easier alternative, since subsidies involving direct expenditure may undergo closer scrutiny than tax expenditures aimed at attracting investment. In fact, few countries produce a regular tax expenditure budget that quantifies the value of incentives while direct expenditures are under scrutiny in any modern budgeting exercise. In addition, some countries may feel under pressure to provide "visible" incentives for multinational companies, who threaten to locate investment elsewhere if they are not given concessions. Incentives also provide a popular way for officials to show efforts to increase employment and incubate or otherwise support industries deemed important to the country.

Many economists would admit, however, if pushed, that a market-failure case can be made for tax incentives to internalize positive externalities in a Pigouvian way. Examples are in respect of: projects located in less developed regions of a country (either to reduce congestion and/or pollution in the developed regions, or to reduce the disparity in income distribution that could be viewed as having some public-good characteristics); projects entailing use of advanced technologies that could raise the general technological absorption capacity of a country; projects that have a high propensity of leading to a build-up of key types of human capital whose benefits usually extend beyond the persons embodying them; and projects that involve research and development activities in targeted areas deemed important for whatever policy reasons. (see Zee, Stotsky & Ley, 2002: 1500).

3. Classification of tax incentives, with reference to South Africa

In South Africa interest in tax expenditure (of which tax incentives form a subset) has flared up from time to time. Heyns (1984) listed 164 tax expenditures and the cost of some, arguing the case for a tax expenditure budget for South Africa. The Margo Commission (RSA, 1988: 67-68) recommended the phasing out of various tax expenditures, some of which were indeed terminated even if with some delay (like the phasing out of the general export incentive scheme). The IMF's (2008) Country Report on South Africa presents a comprehensive list of tax expenditures. The first time an official list of tax expenditures was published, was in the 2011 Budget Review (RSA, 2011: 181). South Africa has yet to publish a fully-fledged tax expenditure budget, however, and little – if any – aggregate analysis has been done on the impact of tax incentives.[4]

Drawing on Zee, Stotsky and Ley (2002: 1502-1507), Table 1 contains a codified list of different types of tax incentives, as well as a brief statement regarding the acceptability (or unacceptability) of the different types of tax incentives from the point of view of allocative or tax efficiency and/or administrative feasibility.[5] A tick (✓) in the second column indicates that this type of incentive is currently applied in South Africa.

Analysis of tax incentives should reflect an absolute analysis (is the incentive "good"?) as well as a relative analysis (is incentive X better than incentive Y?). The normative analysis of tax incentives consists of concerns over economic efficiency and equity. The welfare cost of incentives should be considered when contemplating and comparing incentives. Similarly, the equity implications are to be taken into account but may be difficult to do so. Tax incentives by their nature are revenue losers and should be offset with an increase in other revenue or a decrease in expenditures, unless of course the intent is to stealthily increase

[4]There has been some analysis of the effectiveness of particular tax incentives, however, such as Flatters (2002) in respect of the motor industrial development programme (MIDP).

[5]When economists *qua* economists do not succeed in stemming the tide and dampening the political affinity for tax incentives, they still have a role to play, namely to advise on which tax incentives are the least unacceptable in the second- or third-best world. And sometimes they are listened to.

TABLE 1. TYPES OF TAX INCENTIVES			
	Incentive type and use in SA	**Statement on acceptability**	**Category code**
Direct tax incentives			
1.	Corporate income tax (CIT) rate incentives		**CITR**
1.1	Tax holidays	• Bulk of revenue forgone is likely to have no beneficial impact on investment. Benefit-cost ratio is low. • Particularly susceptible to tax planning (i.e. avoidance schemes), including fictitious foreign-owned companies. • Not recommendable.	**CITR-TH**
1.2	Preferential CIT rates ⤴	• Rules are complex and subject to manipulation. • Identifying the qualifying income is problematic. Income from both existing and new operations becomes eligible. It is less likely to be cost-effective than incentives related to the amount of new investment. • Not recommendable.	**CITR-PR**
2.	Investment cost-recovery incentives		**ICR**
2.1	Investment allowances ⤴	• Of greatest benefit to firms with income from existing operations, who can shelter a portion of their income from tax with the incentives earned on the new investment. • Firms with low income or start-up firms cannot begin to take advantage of the incentive until investment begins to earn taxable income. • Revenue impact in theory tied to the degree of new activity: relatively small in early years of program and grows over time as more firms become eligible. • Carry-forward of deductions by firms that cannot fully use them can considerably raise the revenue cost over time. • Meritorious.	**ICR-IA**
2.2	Investment tax credits ⤴	• Can be manipulated, using subsidiary costing, to claim benefit for inefficient spending or cost (together with depreciation allowances) exceeding investment.	**ICR-ITC**
3.	Accelerated depreciation ⤴	• Incentive in form of accelerated depreciation. • Amount written off reduces future depreciation base, ensuring total amount written off cannot exceed the actual investment cost. • Has fewest of the shortcomings associated with CIT rate incentives and all of the virtues associated with investment cost-recovery.	**AD**
4.	Investment subsidies	• Can be in form of income tax relief and/or preferential tax rates on interest, dividends and capital gains • Least meritorious.	**IS**
Indirect incentives			
5.	Export-oriented incentives (tariff or VAT exemptions) ⤴	• Very prone to abuse, as qualified purchases can easily be diverted to buyers not intended to receive the incentives. • Duty draw-back schemes a better version.	**EO**
6.	Export processing zones	• Tax incentives available in these zones often comprise both indirect and direct taxes – latter often tend to attract economic activities unrelated to exports.	**EPZ**

the general tax burden. We do not attempt to do a full fiscal incidence analysis at this time and so we concentrate on the efficiency aspects of the tax incentives.

Incentives may impact welfare, employment, and income over a short or long period. The longer the payback to an incentive, the lesser will be the net present benefit of that incentive. An exception might be when the tax incentive is supposed to internalize a social benefit, such as in the case of new technology, or addressing a structural bias against market entry (although the first-best solution would be to remove the structural barrier). A central question then becomes, what is the period of analysis? Incentive schemes are often designed to generate tax benefits on the basis of performance criteria, such as job creation, generation of foreign exchange and decentralisation into particular regions (e.g. relocation of industry to rural areas to counter urbanisation or for some other politico-economic reason[6]). It is difficult to evaluate the efficiency of such types of incentives as one is required to value allocative efficiency as well as equity.

Table 2 contains an illustrative matrix for South Africa, and includes a list of tax incentives (of the types indicated in Table 1 with ⇂), a category code and information on the type and nature of tax to which the incentive is linked, as well as the nature of, reasons for, estimated cost of the incentive (based on very heroic assumptions), and economic acceptability of the incentive. It should be noted that the introduction of a tax incentive often adds to the cost of administration. Admittedly, there are also cases where a tax allowance may well save administrative cost, for example exempting very small business from income tax.

TABLE 2. TAX INCENTIVES PERTAINING TO MANUFACTURING IN SOUTH AFRICA, 2009

Incentive Type/ Category Code	Nature of Incentive	Reasons for Incentive	Acceptability of Incentive	Other comments / assessment(s)	Cost estimate (08/09), [2009 R m]
Rebate on import duties in manufac-ture for home con-sumption or export EO	Partial rebate or a rebate of the full duty on certain specified imported goods	To stimulate local manufacture, to reduce input cost of locally manufactured goods which in turn allow local manufacturers to be more competitive in international trade	Target winners; duty draw-back schemes a better version	Beneficiaries in 2008/09: light motor vehicles (MIDP) (R 5 635 m); heavy motor vehicles (R 942 m); motor vehicle parts & accessories (R 594 m); textile (R 426 m); furniture & fixtures (R 128 m)	**14 241**

[6]An interesting example is Germany, where tax incentives are offered for industrial development in the area of the former DDR.

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Special small business corporation tax structure CITR-PR	Reduced rate of taxation and special tax regime - presumptive tax, enhanced depreciation regime, capital gains tax relief, relief from skills development levy, graduated scale: • Tax threshold: R 59 750 • Taxable income R 59 751 - R300 000: 10% of amount > R 59 750 • Taxable income ≥R 300 001: R24 025 (plus 28% of amount > R300 000)	Reduce the cost of compliance for small businesses and encourage expansion of small businesses	Differential tax rates lead to perverse incentives to decompose larger entities into smaller ones; may encourage non-profitable small businesses to develop	• No sunset clause • Stern & Barbour (2005) estimated METR for SMEs between 22-32% (corporate rate then 29%); higher than standard tax regime in formal sectors; 16% if registered for VAT	**675**
Film allowance ICR	An incentive for locally owned productions filming in South Africa; allows rebate up to 35% of qualifying expenditure on productions of a total budget ≥ R2.5 million; R10 m cap	Increase investment in development of new business	Can be manipulated, using to claim benefit for inefficient spending or cost (together with depreciation allowances) > investment; cap contains risk	• Number of beneficiaries have dropped from peak of 67 in 2003/04 to 7 in 2008/09	**319**
Research and Development Allowance ICR-ITC	Increased expensing of assets and recurrent expenditures • Tax allowance for purchase of equipment and buildings deducted at 50:30:20% (average 33.3%); cur-rent expenditure deducted at 150%.	Increase investment in development of new technologies, production techniques, etc.	R&D credits can reduce entrepreneurial risk and encourage innovation and growth; difficult to monitor R&D investments relative to regular costs	• No sunset clause • In 2008/09 2 015 companies benefitted, down from the 2006/07 peak of 3 087	**219**
Learnership Allowance ICR	Allowances (additional deductions) for training	Increase skill of workforce, reduce cost of expanded training	Providing training via the tax system could lead to evasion; more acceptable if in form of expenditure		**193**

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Incentive Type/ Category Code	**Nature of Incentive**	**Reasons for Incentive**	**Acceptability of Incentive**	**Other comments / assessment(s)**	**Cost estimate (08/09), [2009 R m]**
			subsidy		
Strategic Industrial Policy Incentive ICR	100% deduction for equipment	Increase investment in critical areas	Targets winners— critical investment areas;		**61**
Urban Developme nt Zones ICR-AD	Accelerated depreciation allowed for investments in qualified zones	Increase investment in urban areas of SA	Long-term effectiveness? Picking winners		**85**
TOTAL					**15 792**

In the remainder of this paper, we focus on those incentives aimed at increasing investment, employment and output and those that are employed through the corporate income tax system in South Africa. There are many additional incentives afforded producers and consumers through various taxes. The South African National Treasury (RSA, 2011: 189-192) produces an estimate of tax expenditures (including explicit tax incentives as well as more implicit tax reductions), which help to understand the nature and magnitude of the many incentives in the country. These incentives form part of a bigger group of incentives containing many expenditure subsidies designed to benefit particular sectors of the economy in one way or another.

4. Analysis of the impacts of tax incentives

Many incentives are focused on increasing investment and employment and many specifically target the UCC in particular industries. Given the link between incentives and the UCC (and wages), one might argue that the first line of evaluation of a large group of incentives is to calculate the impact of incentives on the effective marginal tax rate on factors of production (METR). The METR measures the difference between net and gross rate of return due to specifics of tax policies within a country.[7] A larger decrease in the METR would be expected to bring greater economic activity. A time series (or cross section) analysis of investment or employment as a function of the METR could be a useful incentive evaluation tool *ex ante*, estimated METRs under various incentives could be a useful way to inform the process of determining the "best" incentive.

METRs are notoriously difficult to calculate as they should reflect very specific tax treatment of capital, including depreciation, carry forward/back of losses, and treatment of capital

[7] Regulatory policies may also be considered. METR analysis is derived from a standard model of profit maximization where the marginal investment is made such that the returns equal costs at the margin.

gains. Calculating METRs over time (or across countries) is that much more difficult due to changes in tax laws, regulations that affect "doing business", etc. Incentives also often focus on a subset of industries (or regions) and attributing a net change in the price of capital as a result is somewhat subjective.

As a result of these complications, there are few if any analyses of tax incentives that take this micro approach of measuring the impact of tax incentives on macro aggregates (growth, employment, etc.) using METRs.[8] Such an analysis might be done *ex post* by regressing changes in macro aggregates such as employment, GDP, or investment against changes in the pre and post incentive METR over time. Alternatively, cross sectional analysis may make use of variation in METRs (overall or by sector) across countries as a determinant of growth in the same macro aggregates. This type of analysis would tend to be retrospective, although past experiences could be used to inform future planned incentives. Moreover, as pointed out by Klem and van Parys (2010: 3), a shortcoming is that METRs do not provide evidence on actual investment outcomes. An alternative would be to focus on growth, employment, etc. by sector over time, using the incentive as a "natural experiment." The problem with both the above-mentioned econometric techniques is that many incentives are small relative to overall GDP, employment, etc. and therefore marginal effects associated with incentives can be difficult to pick up in a time series analysis. Very targeted incentives such as investment in certain regions of the country and in certain industries may simply be monitored with local data on employment and output.

There are at least two alternative approaches that might be used to help evaluate the relative impact of incentives. If governments' primary goal of incentives is to increase output, employment and growth, the most useful analysis of incentives is an *ex ante* one that compares the potential impacts of incentive X over incentive Y. Of course, such an analysis should also include a relative measure of acceptability – a "do the least harm" sort of approach to tax incentives. In support of this type of analysis, a simple social accounting matrix or input-output multiplier analysis could be very effective in guiding government to the most cost-effective incentive. For want of a better label, we will refer to these as SAM analyses.[9]

[8] There are however, a number of studies that estimate the METR at a point in time. For example, the FIAS studies for Zambia and Rwanda report METRs for those countries and also for South Africa, Malawi, Tanzania, Zimbabwe, Kenya and Uganda. These FIAS reports include METRs by major industries.

[9] A SAM is different from an input–output matrix because it not only traces the income and expenditure flows of activities and commodities, but it also contains complete information on different institutional accounts, such as households and the government. SAM multipliers are an extension of the classic Leontief input-output model. While the Leontief model concentrates on inter-industry production linkages, SAM-based models also include consumption linkages. Consumption linkages are included by making institutions like households and the government "endogenous." The SAM multiplier approach therefore makes use of information on household factor endowments and income distribution. SAM multiplier models have been used for a wide range of issues from trade policies and macroeconomic shocks to farm-nonfarm linkages. The SAM multiplier framework can be used to estimate the impacts of changes in any of the exogenous demand accounts in the model. Because we are treating households as endogenous in the model, this leaves three possible sources of

A SAM analysis provides insight into the following issues: per one rand of tax expenditure on a particular tax incentive, what is the potential payback country-wide? What industries are likely to be impacted by way of the multiplier? If the same incentive were considered for two different industries but could only be given to one industry, which would be more expansionary?

The SAM analysis is by no means clear-cut. First, an assumption would need to be made regarding the impact of the incentive on the target industry. For example, if accelerated depreciation in the manufacturing sector reduced the cost of capital by 25 percent, what is the impact on output? A standard production function could be used to estimate the elasticity of output with respect to those input prices. Once that estimate is made, the SAM entry for manufacturing output could be inflated to reflect the new induced level of output. In a standard multiplier framework, this increase will require increased inputs from a variety of industries, which can be determined from an I-O model. An example follows. Based on data from the 2008 SAM[10] (Quantec Research, 2010), the motor vehicles, parts and accessories industry utilizes inputs from 35 industries of the 41 basic industries in our analysis. For example, this industry utilizes R 755 m of agriculture, forestry and fishing output, R 13 m from coal mining and R 2 601 m from other mining, among other industries. In total, it uses R 135 747 m to produce a total level of output for the industry of R 292 565 m. Compare this to another type of manufacturing—professional and scientific equipment, which utilizes inputs from 27 industries. This industry uses R 4 943 m of inputs from other industries to produce output of R 11 583 m.

If the inputs were of similar relative magnitude, a one rand increase in motor vehicles, parts and accessories output coming from a tax incentive would be estimated to have a larger impact than a one rand increase in output of the professional and scientific equipment industry. This analysis does not weigh government goals such as protecting 'home industries' or the redistribution (among workers or regions of the country) that may be implicit when focusing incentives on one industry over another. The SAM analysis simply shows the potential difference in relative magnitude of various tax incentives. This analysis is therefore quite relevant to the policy discussion surrounding tax incentives. *Ex post* this analysis provides a metric for analyzing the outcomes of incentives, measured carefully by industry as the change in the level of output (and employment, which can be analyzed with a full I-O model analysis).

One might also look to the impact of incentives on potential levels of output using multiplier analysis, which is in part developed from the SAM. The basic Leontief multipliers categorize the increased output in connected industries for an increase in output of any one industry.

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demand stimulus: export demand, government spending, and investment demand. Exogenous changes in demand for these accounts are then transmitted to endogenous accounts, including producing sectors and households. In general SAM multipliers are larger than I-O or Supply-Use multipliers.

[10] Given that the latest SAM published by Statssa is for the year 2005 it was decided to use the Quantec Research SAM updated annually. The latest version is for 2008. Specific detail on the SAM is in Appendix A.

Using the relationships implicit in the SAM, the multipliers allow estimates of the increased economic activity across sectors that provide the input supplies to the sector in question. *Ex ante*, it is useful to gauge the potential impact across sectors for an incentive regime that is focused on one particular sector. The externalities that arise through the multiplier effects could enhance the value of the incentives or potentially be detrimental in extreme cases where competing industries are needed to supply the subsidized industry.

To engage a multiplier model, one needs to know the impact of a tax incentive on the output of the targeted industry. The impact is of course a function of the production function as well as supply and demand of factors of production and demand for the output and the relative reduction in the cost of capital from the incentive. For this preliminary analysis, we assume that the tax incentive lowers the cost of capital by 100 percent of the incentive and under assumptions of perfect competition, lowers the price of output by the share of capital in the total of capital (consumption of fixed capital) plus labor (from the SAM). For ease of analysis, we assume that the change in the level of output is equal to the change in the price (using total value of output from the SAM as our baseline). Any of these assumptions may be changed or made more specific to the industry. This analysis is explained in the examples below.

Based on our analysis of current incentives in South Africa (Table 3)[11], we find that the incentives are aimed at nine general sectors as follows (with amounts in R million):

1.	Agriculture, hunting, forestry and fishing	20.39
2.	Mining and quarrying:	13.24
3.	Manufacturing:	14,687.84
4.	Electricity, gas and water supply:	16.67
5.	Construction:	89.89
6.	Wholesale/retail trade, repairs, hotels and restaurants:	266.82
7.	Transport, storage and communication:	59.85
8.	Financial:	312.02
9.	Community, social and personal services:	59.95

[11] In Table 3 the listed sub-sectors were selected so as to approximate the sectors contained in the I-O table. Comments in brackets in the first column provide further information on the relationship between the standard industrial classification used in Table 3 and the sectors in the I-O table.

TABLE 3. ALLOCATION OF TAX SUBSIDIES IN SOUTH AFRICA BY ECONOMIC SECTOR, 2008/09, R MILLION								
TYPE OF ECONOMIC ACTIVITY[1]	SIC CODE	REBATE ON IMPORT DUTIES IN MANUFACTURE FOR HOME CONSUMPTION OR EXPORT[1]	SPECIAL SMALL BUSINESS CORPORATION TAX STRUCTURE[2]	FILM ALLOWANCE[3]	RESEARCH AND DEVELOPMENT ALLOWANCE[4]	LEARNERSHIP ALLOWANCE[5]	STRATEGIC INDUSTRIAL POLICY INCENTIVE[6]	URBAN DEVELOPMENT ZONES[7]
		R million						
MAJOR DIVISION 1: AGRICULTURE, HUNTING, FORESTRY AND FISHING			6.45			13.94		
Agriculture, hunting and related services	**11**							
Commercial cereal crops	111							
Commercial other crops	111							
Commercial animal products	112-114							
Fishing	13							
MAJOR DIVISION 2: MINING AND QUARRYING			7.43			5.81		
Mining	21-25							
MAJOR DIVISION 3: MANUFACTURING			98.23		219	34.69	61	33.92
Manufacture of food products, beverages and tobacco products	30							
Production, processing and preservation of meat, fish, fruit, vegetables, oils and fats	***301***							
Meat processing	3011							
Fish processing	3012							
Manufacture of grain mill products, starches and starch products and prepared animal feeds	***303***							
Grain milling	3031							
Manufacture of beverages and other food products	***304-305***							
Beverages and other food processing								
Manufacture of textiles, clothing and leather goods	**31**							
Textiles	311-312	2 024						
Manufacture of wood and of products of wood and cork, except furniture; etc	**32**							
Manufacture of wood and products of wood, except furniture; etc. (This covers the "wood" part of "Wood, Furniture, Misc")	321-322							
Manufacture of paper and paper products (This covers the "paper" part of "Paper, printing")	323							
Publishing	324							
Printing and service activities related to printing (This, together with "publishing" covers the "printing" part of "Paper, printing")	325							
Manufacture of coke, refined petroleum products and nuclear fuel; manufacture of chemicals and chemical products; manufacture of rubber and plastic products	**33**							
Petroleum refineries/synthesisers (Petroleum products)	332							
Chemicals & rubber	334,335,337							
Manufacture of other non-metallic	**34**							

TABLE 3. ALLOCATION OF TAX SUBSIDIES IN SOUTH AFRICA BY ECONOMIC SECTOR, 2008/09, R MILLION								
TYPE OF ECONOMIC ACTIVITY[1]	**SIC CODE**	**REBATE ON IMPORT DUTIES IN MANUFACTURE FOR HOME CONSUMPTION OR EXPORT[1]**	**SPECIAL SMALL BUSINESS CORPORATION TAX STRUCTURE[2]**	**FILM ALLOWANCE[3]**	**RESEARCH AND DEVELOPMENT ALLOWANCE[4]**	**LEARNERSHIP ALLOWANCE[5]**	**STRATEGIC INDUSTRIAL POLICY INCENTIVE[6]**	**URBAN DEVELOPMENT ZONES[7]**
		R million						
mineral products								
Non-metallic mineral prod	321-342							
Manufacture of basic metals, fabricated metal products, machinery and equipment and of office, accounting and computing machinery	**35**							
Basic Metals	351-353							
Manufacture of fabricated metal products (354 and 355)	354-355							
Manufacture of machinery and equipment n.e.c	356-358							
(The two categories above cover "Fabr metals, Machinery")								
Manufacture of electrical machinery and apparatus n.e.c.	**36**							
Manufacture of radio, television and communication equipment and apparatus and of medical, precision and optical instruments, watches and clocks	**37**							
Manufacture of transport equipment	**38**							
Manufacture of furniture; manufacturing n.e.c.; recycling	**39**							
Manufacture of light and heavy motor vehicles; parts and accessories [Not explicitly listed in I-O]	381-383	12089						
Manufacture of furniture (This covers the "furniture" part of "Wood, Furniture, Misc")	391	128						
MAJOR DIVISION 4: ELECTRICITY, GAS AND WATER SUPPLY			0.25			1.66		15.06
Electricity, gas, steam and hot water supply	**41**							
Production, collection and distribution of electricity (Electricity)	411							
Collection, purification and distribution of water (Water)	42							
MAJOR DIVISION 5: CONSTRUCTION			14.26			19.4		3.23
Construction	50							
MAJOR DIVISION 6: WHOLESALE AND RETAIL TRADE; REPAIR OF MOTOR VEHICLES, MOTOR CYCLES AND PERSONAL AND HOUSEHOLD GOODS; HOTELS AND RESTAURANTS			199.67			55.07		12.08
Trade; repairs	61-63							
Hotels and restaurants	64							
MAJOR DIVISION 7: TRANSPORT, STORAGE AND COMMUNICATION			26.11			13.03		20.71
Transport	71-74							
Post and telecommunications (Communication)	75			319				
MAJOR DIVISION 8: FINANCIAL INTERMEDIATION, INSURANCE, REAL ESTATE			282.93			29.09		

TABLE 3. ALLOCATION OF TAX SUBSIDIES IN SOUTH AFRICA BY ECONOMIC SECTOR, 2008/09, R MILLION								
TYPE OF ECONOMIC ACTIVITY[1]	SIC CODE	REBATE ON IMPORT DUTIES IN MANUFACTURE FOR HOME CONSUMPTION OR EXPORT[1]	SPECIAL SMALL BUSINESS CORPORATION TAX STRUCTURE[2]	FILM ALLOWANCE[3]	RESEARCH AND DEVELOPMENT ALLOWANCE[4]	LEARNERSHIP ALLOWANCE[5]	STRATEGIC INDUSTRIAL POLICY INCENTIVE[6]	URBAN DEVELOPMENT ZONES[7]
		R million						
AND BUSINESS SERVICES								
Finance and insurance	81-83							
Real estate, own	84							
MktRealEst + Business services	85,86, 88							
MAJOR DIVISION 9: COMMUNITY, SOCIAL AND PERSONAL SERVICES						20.29		
Other private services	94		39.66					
Government services	91-93							
Direct purchases abroad by residents	uncert ain							
TOTAL VALUE OF INCENTIVE		**14 241**	**674.99**	**319**	**219**	**192.98**	**61**	**85**

Source of data: Derived from National Treasury (2011: 181), based on assumptions about sector incidence of tax incentives as explained in notes below.

Notes

(1) The listed sub-sectors were selected so as to approximate the sectors contained in the I-O table. Comments in brackets in the first column pertain to the relationship between the standard industrial classification used in Table 3, the sectors in the I-O table and the assumed sector incidence of the tax incentives.

(2) The sectoral allocation of the benefit from the small business corporation tax structure was calculated as follows. SMMEs' contribution to turnover of each sector for 2008 was used to calculate the value of their sectoral contribution. The resulting ratios were used to allocate SMMEs' contribution to the net profit before tax and dividends for each sector. The resulting ratios were used to allocate the 2008/09 tax benefit – as calculated by National Treasury – per sector. Sectoral figures for turnover and net profit were obtained from StatsSA (2010): Annual financial statistics, 2009. Statistical release P0021. Available at http://www.statssa.gov.za/publications/P0021/P00212009.pdf. Accessed 26-07-2011. Tax benefit figures were obtained from National Treasury (2011: 181).

(3) The benefit from the film incentive has been allocated to "communication", which forms part of the sector "transport, storage and telecommunication". The amount is for 2007/08 (the latest available). Source of data: National Treasury (2011: 181).

(4) It is assumed that the entire research and development allowance benefit accrues to the manufacturing sector.

(5) It is assumed that the learnership allowance accrues to sector proportionately to the number of employees per sector (excluding government and community services) in the first quarter of 2008. Employment figures from StatsSA (2008)

(6) The Strategic Industrial Projects incentives (12G) allowed a 100% deduction on equipment up to a threshold and apply to manufacturing.

(7) The tax incentive pertaining to the upgrading of property in urban development zones (mainly office parks, residential and commercial (shops/shopping centres)) has been allocated to sectors of major presence in these zones and in proportion to their gross fixed capital formation in 2008.

These sectors do not perfectly co-ordinate with our SAM, so we make an adjustment and assign the 9 affected sectors to more specific sectors as noted in Table 4 (based on details for the incentives where we have them). For each of the realigned nine sectors, we report the total value of incentives afforded the sector, the ratio of capital/(capital plus labor) and the change in the price of output (incentive * (K/K+L)). We assume that the change in output is equal to the change in price. We run this "shock" or increase in demand (by sector) through the multiplier model[12] to determine the net impact on output of all industries (the targeted industry as well as the suppliers) and list that in the fifth column of Table 4. The

[12] See Breisinger, Clemens, Thomas and Thurlow (2010) for a detailed description on the calculation of SAM multipliers.

final column of Table 4 reports the ratio: net impact/incentive. A value greater than one represents a net benefit over the cost of the incentive.

Table 4: Multiplier analysis of current tax incentives in South Africa

Sector	Total incentives R m	(K/K+L)	Change in output	Net effect (change in output over all industries due to multiplier)(1) R m	Impact/ incentive
Agriculture, forestry, fishing	20.39	0.32240833	6.57390584	22.54756469	1.105814845
Other mining	13.24	0.309260663	4.09461118	9.719302275	0.734086275
Motor vehicles, parts, accessories	14 687.84	0.385272239	5658.817004	15715.4299	1.069961948
Electricity, gas, steam	16.67	0.423091946	7.052942739	24.46867458	1.46782691
Building construction	89.89	0.129675936	11.65656993	44.45539092	0.494553242
Wholesale trade	266.82	0.160463053	42.81475187	155.5968081	0.583152718
Transport, storage	59.85	0.385507329	23.07261364	66.01533789	1.103013164
Finance and insurance	312.02	0.22166697	69.16452791	241.4649335	0.773876461
Community, social and personal services	59.95	0.046618379	2.794771795	9.747110226	0.162587327

Note: (1) The government sector, savings and investment as well as the rest of the world are exogenous to the model.

While these estimates are relatively crude regarding the price and output effects, they illustrate the differences in incentives across sectors. The net impact to incentive ratios are large for incentives aimed at the agriculture, motor vehicles, electricity and transport sectors and relatively small impacts for trade, mining, finance and community services. These results come from the number and magnitude of the interactions among industries. If the government's objective is to increase total output (and employment), this analysis provides some evidence that the impacts are very different depending on the incentivized industry.

The limitations of SAM and multiplier analyses are well known. The increase in output is not countered by any resource constraints. In these models, additional inputs will be found,

additional output will be consumed (implicitly). The relationships among industries are fixed – doubling the output of industry X will necessitate doubling the input from supporting industry Y. There are no economies of scale. The implicit production function for output is the same across industries. We have made heroic assumptions regarding the impact of incentives on output to operationalize these models. For relatively small incentives, these limitations may be acceptable given the benefit of comparing "apples to apples" impacts of a set of incentives. At this stage, the SAM and multiplier analyses simply show the potential difference in relative magnitude of various tax incentives. These analyses are therefore quite relevant to the policy discussion surrounding tax incentives. *Ex post* these analyses provide a metric for analyzing the outcomes of incentives, measured carefully by industry as the change in the level of output (and employment, which can be analyzed with a full I-O model analysis).

An alternative analytic approach to analyzing tax incentives is a computable general equilibrium model. A CGE model allows analysis of changes in tax rates to affect consumption and production while respecting assumed resource constraints. Many CGE models are not disaggregated enough to analyze relative small changes like tax incentives that reduce the UCC for particular industries and the complicated relationships within the model make it difficult to analyze relatively small changes. Such changes get "lost" in recalibration and may introduce non-convexities that result in non-convergence of new equilibrium positions. CGE models are very helpful for understanding the relative impact of large-scale "macro" tax incentives such as a change in the corporate tax rate, elimination of all exemptions, etc.

Additional analyses could be done to consider the distributional implications of tax incentives – who wins and who loses? The "cost" of the tax incentive in the short run is a matter of debate. If a government operated under a balanced budget of sorts, the tax incentive would have to be financed through higher other taxes (perhaps general funds) or via lower expenditures. The resulting net fiscal burden could be regressive or progressive. It would also be useful to analyze the subsidy side of the incentives game. The same tools of public finance can be used to demonstrate the effectiveness, efficiency and equity of using direct subsidies (versus tax expenditures) to incentivize particular industries. In some countries, expenditure subsidies may be more politically acceptable in that they are seen as a short-term expenditure that can be eliminated in the future. Subsidies should also reach the regular expenditure budget of governments and thereby be more transparent than tax incentives.

5. Alternatives

What are the alternatives to tax incentives? The most common approach is to consider the corporate tax reduction which an abolishment of all investment tax incentives would make possible. This macro tax incentive could be analyzed and compared to, for example, the cost

of those listed in Table 3. A wide-scale measure such as reduction in the corporate income tax rate is difficult to analyze without a full CGE approach. However, using a very similar approach to that of the multiplier analysis above, we can offer some intuition regarding the potential impact of a general corporate tax reduction. We cannot at this stage say anything about the welfare or distributional effects of a general tax reduction versus specific tax incentives.

Using our multiplier model, we assume once again that a decrease in the corporate tax rate will reduce the user cost of capital in line with capital's share of factor inputs in each sector. Using the same methodology as above, we impose a corporate tax reduction "shock" equal to the total value of incentives investigated in Table 4 (R 15 526.7 million). We allocated a share to each sector based on the output of the sector as a share of total output according to the SAM we use. We use sectors 1-42 in our matrix. The impact of such a change induced by an overall corporate tax decrease is an increase in output of R 56 017 million—which yields a benefit (net increase in output) to cost (total cost of incentive) of 3.6. This is much larger than any of the targeted incentives listed above. We understand that not all sectors would actually benefit from a corporate tax reduction (those in the non-profit sector or industries with large numbers of small and start-up companies)—however, the overall magnitude of impact from a general corporate tax reduction certainly seems to warrant more attention as a potential replacement for the piecemeal approach of targeted incentives.

Another approach to analysis of tax incentives is to consider the opportunity cost of tax incentives with reference to other government programmes which could be financed, particularly of a pro-poor nature.

Another alternative to tax incentives is cooperation among countries. Such cooperation is notoriously difficult but interest in cooperation has grown as competition has become more and more fierce. Cooperation can be of many forms.

It is also possible for countries to address the incentive issue through a general rationalization of tax systems. If the tax expenditures associated with tax incentives were used to provide across-the-board reductions in tax rates, countries may be able to effectively and rationally attract investment. In such cases, the market would 'pick the winners' instead of government. Of course this leaves out targeted incentives where government wants to pick winners. In addition, countries could engage in more rigorous enforcement of rational transfer pricing, tax shelter laws and regulations, etc.

6. Conclusion

Tax expenditures are likely to continue to be part of development policy in South Africa and around the world. There is mixed evidence of the impact of targeted incentives. In this paper, we attempt to shed more light on how we might evaluate tax incentives to assist

policy makers' decisions regarding particular incentives. We categorize tax incentives by "type" and provide a context for developing a hierarchy of tax incentives that would be expected to have more or less economics impacts ("good" and "bad"). We also provide some early empirical analysis of the potential impacts of various targeted incentives, using data on incentives that are currently in use in South Africa.

Specifically, preliminary analysis demonstrates that relatively simple tools such as social accounting matrices and Leontief multipliers can provide policy makers a means to evaluate the relative value of incentives with respect to their output effects. With these models, we provide preliminary evidence of the superior impact of a general tax incentive such as a reduced corporate tax rate on output. Future research will focus on the development of a CGE model that can provide more detailed analysis of such a large scale change. We also plan to evaluate the expected impact of subsidies versus tax incentives in South Africa.

What remains is identifying an *ex post* evaluation of tax incentives. Using the estimates of expected changes in output (from the multiplier analysis and in the future from CGE analysis), we will attempt to estimate before and after output changes.

References

Bird, Richard M. (2008), "Tax Challenges Facing Developing Countries", Rotman Institute for International Business Working Paper Series IIB Paper no 12. Toronto: University of Toronto Joseph L. Roman School of Management.

Breisinger, Clemens, Marcelle Thomas and James Thurlow (2010), "Social accounting matrices and multiplier analysis ," International Food Policy Research Institute, Washington, D.C.

Deloitte (2009), "Incentives 2009: Complex Issues, Comprehensive Solutions," Johannesburg, South Africa.

De Mooij, Ruud A. and Sjef Ederveen (2003), "Taxation and Foreign Direct Investment: A Synthesis of Empirical Research" *International Tax and Public Finance* 10(6): 673-693.

Flatters, T. (2002), "From import substitution to export promotion: driving the South African motor industry." Note presented at a session on the success of the South African auto industry at the tips annual forum in Muldersdrift, South Africa September 9-11, 2002. Available at http://www.tips.org.za/node/1172, accessed 10 August 2011.

Foreign Investment Advisory Service (FIAS) (2001), "Using Tax Incentives to Compete for Foreign Investment: Are They Worth the Costs?" The International Finance Corporation and the World Bank, Washington, D.C.

_____ (2004), "Zambia Sectoral Study of the Effective Tax Burden," The International Finance Corporation and the World Bank, Washington, D.C.

_____ (2006a), "Sector Study of Effective Tax Burden: Rwanda," The International Finance Corporation and the World Bank, Washington, D.C.

_____ (2006b), "Sector Study of Effective Tax Burden: South Africa," The International Finance Corporation and the World Bank, Washington, D.C.

Hall, R. and D.W. Jorgenson (1967), "Tax policy and investment behavior", *American Economic Review* **57**(3): 391-414.

Heyns, J. van der S. (1984), "Towards a tax expenditure budget for South Africa", Economic Research Unit of the University of Natal Occasional Paper no 15, Durban.

Holland, D. and R.J. Vann (1998), "Income Tax Incentives for Investment" in V. Thuronyi (ed) (1998), *Tax Law Design and Drafting (Vol 2)*, International Monetary Fund: Washington DC, chapter 23 (pp 986-1020).

James, Sebastian (2009), "Incentives and Investments: Evidence and Policy Implications," Foreign Investment Advisory Service (FIAS), Washington, DC.

IMF (international Monetary Fund) (2008), "South Africa: Selected Issues". IMF Country Report No. 08/347 October 2008, Washington, D.C.

_____ (2011), Statement by the IMF Mission at the Conclusion of a Visit to Uganda. Press Release No.11/112, April 4, 2011, Washington, D.C. Available at http://www.imf.org/external/np/sec/pr/2011/pr11112.htm.Accessed 19 July 2011.

Keen, Michael and Mario Mansour (2009), "Revenue Mobilization in Sub-Saharan Africa: Challenges from Globalization," International Monetary Fund Working Paper 09/157, Washington, D.C.

Klemm, Alexander and Stefan Van Parys (2009), "Empirical Evidence on the Effects of Tax Incentives," International Monetary Fund Working Paper 09/136.

Margo Commission. 1987. *Report of the Commission of Inquiry into the tax structure of the Republic of South Africa* (Chairman: C.S. Margo). RP34/1987. Pretoria: Government Printer.

McKenzie, Kenneth J. (2007), "Analysis of the Effective Tax Burden on Investment in Ten Sub-Saharan African Countries," presentation at the conference "Tax and the Investment Climate in Africa," sponsored by FIAS and DFID, February 26-27, 2007, Zambia. Avaiable at http://www.ifc.org/ifcext/fias.nsf/AttachmentsByTitle/Zambiataxconference_Presentation3/$FILE/Presentation+3.pdf, accessed on 1 May 2011.

McKinsey Global Institute (2003), "New Horizons: Multinational Company Investment in Developing Countries." Available at http://www.mckinsey.com/mgi/, accessed on 13 July 2011.

National Treasury (2010), "Measuring and Reporting Tax Expenditures in South Africa," Pretoria, South Africa.

OECD (2010), *Tax Expenditures in OECD countries*, Paris. Available at http://www.oecd.org/publishing/corrigenda.

Perrault, Jean-Francois, Luc Savard, and Antonio Estache (2008)."The Impact of Infrastructure Spending in Sub-Saharan Africa: A CGE Modeling Approach," Africa Infrastructure Country Diagnostic Working Paper 15, The World Bank, Washington, D.C.

Quantec Research (2010). "SAM for South Africa – 2008", Pretoria: Quantec Research.

RSA (1988): White Paper of the Commission of Inquiry into the Tax Structure of the Republic of South Africa (the Margo Report) [WP C-88]. Pretoria: Government Printer.

_____ (2011): Budget Review, 2011. Pretoria: National Treasury. Available at http://www.treasury.gov.za/, accessed on 10 August 2011.

StatsSA (2008): *Quarterly Labour Force Survey*. Statistical release P0211, 2nd quarter, 2008. Available at http://www.statssa.gov.za/publications/statspastfuture.asp?PPN=P0211&SCH=4910; accessed 10 August 2011.

_____ (2010): *Annual financial statistics, 2009*. Statistical release P0021. Available at http://www.statssa.gov.za/publications/P0021/P00212009.pdf; accessed 26-07-2011.

Stern R and Barbour P, (2005), *Designing a Small Business Tax System That Enhances Growth: Lessons From Africa* (World Bank Working Paper).

United Nations (2000), "Tax Incentives and Foreign Direct Investment: A Global Survey," New York and Geneva: www.**unctad**.org/en/docs/iteipcmisc3_en.pdf

United Nations Conference on Trade and Development (UNCTAD) (2006), "Investment and Policy Review Rwanda," Geneva: United Nations.

UN on Rwanda (no date): http://www.unctad.org/en/docs/iteipc200611annex_en.pdf

Van Parys, S. and S. James (2010), "The Effectiveness of Tax Incentives in Attracting Investment: Panel Data Evidence from the CFA Franc Zone," *International Tax and Public Finance*, DOI: 10.1007/s10797-010-9140-1.

Wisconsin Legislative Reference Bureau (2006), "State Incentives for the Film Industry," http://legis.wisconsin.gov/lrb/pubs/wb/06wb3.pdf, accessed on August 8, 2011.

Zee, Howell H, Janet G. Stotsky and Eduardo Ley (2002), "Tax Incentives for Business Investment: A Primer for Policy Makers in Developing Countries", World Development 30(9): 1497-1516.

Appendix A

The 2008 Quantec RSA Social Accounting Matrix

One way of depicting the economy is the well-known circular flow diagram which captures all transfers and real transactions between sectors and institutions. Productive activities purchase land, labour and capital inputs from the factor markets, and intermediate inputs from commodity markets, and use these to produce goods and services. These are supplemented by imports (M) and then sold through commodity markets to households (C), the government (G), investors (I), and foreigners (E). In the circular flow diagram, each institution's expenditure becomes another institution's income. In other words, all income and expenditure flows are accounted for, and there are no leakages from the system.

A social accounting matrix (SAM) is also a representation of the economy. More specifically, it is an accounting framework that assigns numbers to the incomes and expenditures in the circular flow diagram. A SAM is laid out as a square matrix in which each row and column is called an "account." Figure A1 shows the 2008 Macro SAM of South Africa. Each cell in the matrix represents, by convention, a flow of funds from a column account to a row account. For example, the circular flow diagram shows private consumption spending as a flow of funds from households to commodity markets. In the SAM, it is entered in the household column and commodity row. The underlying principle of double-entry accounting requires that, for each account in the SAM, total revenue equals total expenditure. This means that an account's row and column totals must be equal.

The SAM distinguishes between "activities" and "commodities". Activities are the entities that produce goods and services, and commodities are those goods and services produced by activities. They are separated because sometimes an activity produces more than one kind of commodity (by-products). Similarly, commodities can be produced by more than one kind of activity. The values in the activity accounts are usually measured in producer prices.

Activities produce goods and services by combining the factors of production with intermediate inputs. This is shown in the activity column of the SAM, where activities pay factors the wages, rents and profits they generate during the production process (that is, value-added). This is a payment from activities to factors, and so the value-added entry in the SAM appears in the activity column and the factor row. Similarly, intermediate demand is a payment from activities to commodities. Adding together value-added and intermediate demand gives gross output. The information on production technologies contained in the activity column is the input part of a typical "input-output table", or factor and intermediate inputs per unit of output.

Commodities are either supplied domestically or imported. Indirect sales taxes and import tariffs are paid on these commodities. This means that the values in the commodity accounts are measured at market prices. A number of economic entities purchase commodities. Activities buy commodities to be used as intermediate inputs for production. Final demand for commodities consists of household consumption spending, government consumption, or recurrent expenditure, gross capital formation or investment, and export demand. All of these sources of demand make up the commodity row. On their own, the commodity row

and column accounts are sometimes referred to as a "supply–use table", or the total supply of commodities and their different kinds of uses or demands.

The Macro SAM in Figure A1 shows only single activity and commodity rows and columns. The Macro SAM is disaggregated into 49 activities producing 49 commodities to form the Micro SAM used in this paper. These categories are: Agriculture, forestry & fishing; Coal mining; Gold & uranium ore mining ; Other mining; Food; Beverages & tobacco; Textiles; Wearing apparel; Leather & leather products; Footwear; Wood & wood products; Paper & paper products; Printing, publishing & recorded media; Coke & refined petroleum products; Basic chemicals; Other chemicals & man-made fibres; Rubber products; Plastic products; Glass & glass products; Non-metallic minerals; Basic iron & steel; Basic non-ferrous metals; Metal products excluding machinery; Machinery & equipment; Electrical machinery; Television, radio & communication equipment; Professional & scientific equipment; Motor vehicles, parts & accessories; Other transport equipment; Furniture; Other industries; Electricity, gas & steam; Water supply; Building construction; Wholesale & retail trade; Catering & accommodation services; Transport & storage; Communication; Finance & insurance; Business services; Medical, dental & other health & veterinary services; Community, social & personal services; Government: General administration; Government: Defence; Government: Law and order; Government: Education; Government: Health; Government: Social; Government: Economic.

A SAM is different from an input–output matrix because it not only traces the income and expenditure flows of activities and commodities, but it also contains complete information on different institutional accounts, such as households and the government. Households are usually the ultimate owners of the factors of production, and so they receive the incomes earned by factors during the production process. They also receive transfer payments from the government and from the rest of the world. Households then pay taxes directly to the government and purchase commodities.

The government receives transfer payments from the rest of the world. This is added to all of the different tax incomes to determine total government revenues. The government uses these revenues to pay for recurrent consumption spending and transfers to households. The difference between total revenues and expenditures is the fiscal surplus or deficit.

According to the *ex post* accounting identity, investment or gross capital formation, which includes changes in stocks or inventories, must equal total savings. The difference between total domestic savings and total investment demand is total capital inflows from abroad, or what is called the current account balance. This is also equal to the difference between foreign exchange receipts and expenditures.

Labour is disaggregated into four categories: semi- and unskilled, skilled, highly skilled and informal. Households are disaggregated into 14 categories using percentiles of the income spectrum. The rest of the world is disaggregated into 12 categories: Africa excluding SADC; SADC; NAFTA; South and Central America; Europe excluding EU; European Union; Eastern Asia; South-central Asia; South-Eastern Asia; Western Asia; Oceania and Not allocated.

Figure A1. Macro SAM[(1)] for South Africa, 2008, Rm

				Production activity		Margins			Production factors			Institution		Institution - government											Savings & investment		ROW		
						ROW				Capital				Net tax on products						Net tax on production		Direct taxes								
				Commodites	Industries	Export	Import	Domestic	Labour	Net operating surplus	Consumption of fixed capital	Enterprise	Household	Taxes on products: Vat	Taxes on products: Customs	Taxes on products: Excise	Taxes on products: Fuel levy	Taxes on products: Other	Subsidies on products	Taxes on production	Subsidies on production	Household	Enterprise	Expenditure	GDFI	Inventory change	Exports	Residual	Total: Columns
				C01	I01	MX	MM	MD	V1	V2	V3	E1	HH01	V4	V5	V6	V7	V8	V9	V10	V11	ITH	ITE	Cg	GDFI	CII	MP	RES	COLTOT
Production activity	Commodites		C01		2 710 372	5 018	54 457	395 693					1 417 589											437 313	513 749	-12 235	809 645	-3 703	6 327 897
	Industries		I01	4 768 401																									4 768 401
Margins	ROW	Export	MX	5 018																									5 018
		Import	MM	54 457																									54 457
	Domestic		MD	395 693																									395 693
Production factors	Labour		V1		1 003 305																								1 003 305
	Capital	Net operating surplus	V2		727 898																						48 254		776 152
		Consumption of fixed capital	V3		301 552																								301 552
Institution	Enterprise		E1							656 796	301 552													44 428					1 002 776
	Household		HH01						1 000 532			478 620												120 073			817		1 600 042
Institution - government	Net tax on products	Taxes on products: Vat	V4	151 904																									151 904
		Taxes on products: Customs	V5	24 215																									24 215
		Taxes on products: Excise	V6	20 382																									20 382
		Taxes on products: Fuel levy	V7	24 316																									24 316
		Taxes on products: Other	V8	16 276																									16 276
		Subsidies on products	V9	-11 299																									-11 299
	Net tax on production	Taxes on production	V10		36 395																								36 395
		Subsidies on production	V11		-11 121																								-11 121
	Direct taxes	Household	ITH										188 283																188 283
		Enterprise	ITE									179 405																	179 405
	Expenditure		Cg									12 265	5 088	151 904	24 215	20 382	24 316	16 276	-11 299	36 395	-11 121	188 283	179 405				2 109		638 218
Savings & investment	GDFI		GDFI									348 180	-11 371											15 265			161 675		513 749
	Inventory change		CII									-12 235																	-12 235
ROW	Imports & payments		MP	878 535					2 773	119 356		244	453											21 139					1 022 500
Residual			RES									-3 703																	-3 703
Total: Columns			COLTOT	6 327 897	4 768 401	5 018	54 457	395 693	1 003 305	776 152	301 552	1 002 776	1 600 042	151 904	24 215	20 382	24 316	16 276	-11 299	36 395	-11 121	188 283	179 405	638 218	513 749	-12 235	1 022 500	-3 703	19 012 578

(1) **Source: © - Quantec Research (Pty) Ltd.**