The Economic Impact of a Rural Land Tax on Selected Commercial Farms in KwaZulu-Natal, South Africa

by

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DECLARATION

I hereby certify that the research reported in this thesis, except where otherwise indicated, is my original work. This thesis has not been submitted for any degree or examination at any other university.

Signed ……..

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I hereby certify that the above statement is correct.

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ABSTRACT

This study investigates the potential economic impact of a land tax implemented in terms of the Local Government Municipal Property Rates Act No. 6 of 2004 ("the LGMPRA") on selected commercial farms in KwaZulu-Natal (KZN) using individual farm data for the period 2001-2006. The study first presents a brief history of land taxes around the world, describing the origins, prevalence and rates of land tax in the United States of America (USA), Australia, Britain and some Nordic countries. This sets the background for a brief history of land taxation in South Africa up to the implementation of the LGMPRA. The study then identifies the economic effects of a land tax, highlighting issues such as the capitalization of a land tax, relevant views of this tax, valuation methodologies, the advantages and disadvantages of a land tax, and the effects of a land tax on future capital investment on farms.

Thirdly, the study presents key provisions in the LGMPRA pertaining to farmers with regard to land tax rebates, reductions and exemptions, farmland valuations and the determination of a land tax rate. The effect and applicability of these rebates, reductions and exemptions on the effective land tax rate are also discussed. Fourthly, the study uses a Residual Income Methodology (RIM) framework to estimate the annual economic profit (return to risk and land excluding capital gains) for five different case study farms in the Mtonjaneni and Umgeni municipal districts of KZN. This RIM framework makes allowance for the opportunity cost of management in estimating annual economic profit. These case studies are typical of the main farming enterprises in KZN such as sugarcane, timber, intensive poultry, intensive dairy, cattle, maize and potatoes. Sensitivity analysis is then applied to assess the effect of land tax rates ranging from 0.5% to 5% of the market value of land and fixed improvements on the five farms' ability to pay a land tax after accounting for rebates proposed by the Department: Provincial and Local Government (DPLG).

The estimated mean annual rate of return to risk and land (excluding capital gains) prior to the land tax for the five case study farms during 2001-2006 ranged from -8.50% to 2.94%, with an average of -1.74%. The case farms' ability to pay a land tax rate of 1%

on the value of improved land with and without proposed DPLG rebates from annual current operating returns ranged from zero to five out of five years, with an average of two out of five years. A 2% land tax rate with such rebates could be financed using annual current operating returns also only in two out of five years on average. These results suggest that land taxes at the proposed rates of 1.5% (Mtonjaneni) or 1% (Umgeni) on these specific farms would markedly reduce the incentive to invest in farm improvements These results also indicate that further research in KZN and other provinces in South Africa needs to be conducted to help ascertain the effects of the implementation of the LGMPRA in other municipalities.

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INTRODUCTION

Since the early 1990s, the South African (SA) Government has considered the implementation of a rural land tax, as reflected by 15 drafts of the proposed Local Government Property Rates Bill. This Bill has now been enacted into legislation as the Local Government Municipal Property Rates Act No. 6 of 2004 (hereafter referred to as "the LGMPRA") (Department: Provincial and Local Government (DPLG), 2004a). President Mbeki signed the LGMPRA into effect on 2 July 2005 (SA Government Gazette No. 27720, 2005). Prior to that date, farm land in South Africa was not subject to property taxes levied by municipalities. The new LGMPRA, however, incorporates all previously unrated land into municipal boundaries, so that farm land that was not rated under the old municipal ordinances is now liable to pay a land tax (DPLG, 2004a).

The power for SA municipalities to levy a tax on land stems from Section 229 of the SA Constitution, which guarantees "rates on property" as "an autonomous source of revenue for municipalities" (Franzsen, 2000:1). In terms of Section 229 of the SA Constitution, a municipality may impose rates on property and surcharges on fees for services provided by or on behalf of the municipality. However, Section 229(2)(a) of the SA Constitution states that a municipality may not exercise its power to levy rates on property in a way that would materially and unreasonably prejudice (a) national economic policies; (b) economic activities across its boundaries; or (c) the national mobility of goods, services, capital or labour (DPLG 2004a: 28).

The idea of funding government via a land tax is not a new one. The classical economist, Henry George, whose work includes *Progress and Poverty* published in 1879, popularized the issue in the United States of America (USA). George saw land taxes as a method of righting injustices and "inefficiencies" that were a part of the day-to-day functioning of democratic capitalism (Lindholm, 1979). Land taxes have been instituted worldwide, allegedly for diverse reasons, such as land restitution and to stimulate the use of idle land. In South Africa, the land tax is intended to "provide local government with access to a sufficient and buoyant source of revenue to fulfill its developmental

responsibilities" (DPLG, 2004b: 5). There is a relatively limited amount of published literature that analyzes the potential economic impact of a land tax on commercial farms in South Africa. Nieuwoudt (1987; 1990; 1995) noted that a land tax is likely to reduce land rents, and hence cause lower farm land values and discourage investment on farms. Franzsen (1995; 2000) concluded that the implementation of land tax on commercial farms could possibly be feasible if the right valuation methods and tax rate determination were used. Van Schalkwyk *et al.* (1994) reported that a land tax may reduce land values, which in turn would affect the security value of land pledged against loans from financial institutions. *No published peer-reviewed study in South Africa, however, has estimated the economic impact of a land tax on commercial farms using actual accounting and economic data for specific individual farms*. The aim of this study, therefore, is to estimate the potential impacts of a land tax on selected commercial farms in KwaZulu-Natal (KZN) using data for the period 2001-2006. The study assesses how a land tax affects annual farm economic profit (the return to risk and land excluding capital gains) that shows the ability of the farm to pay a land tax out of current operating returns after accounting for the opportunity cost of resources other than land used on the farm (Ortmann, 1987).

A Residual Income Methodology (RIM) is developed to estimate the annual and mean annual economic profit for five selected commercial farms in KZN within the Mtonjaneni and Umgeni municipal districts that have different farming enterprises. This RIM first estimates the annual return to risk and land (economic profit) for each farm adapting the framework suggested by Kay and Edwards (1999). It then applies sensitivity analysis to show the effects on economic profit of different land tax rates applied to the market value of land and fixed improvements (the basis for valuing land in terms of the LGMPRA (DPLG, 2004a)). The sensitivity analysis also accounts for potential land tax rebates as proposed by the DPLG in the "Generic Rates Policy Format (GRPF)" guidelines (DPLG, 2004c).

The dissertation is organized as follows: Chapter 1 briefly reviews literature on the history of land taxation around the world and in South Africa. Chapter 2 describes the

economic effects of a land tax including the structure, capitalization and incidence of a land tax, and approaches to land taxation and valuation. Chapter 3 outlines the key provisions of the LGMPRA that affect commercial farms in South Africa, and the GRPF guidelines for estimating land tax rebates for commercial farms. Chapter 4 contains the study research methodology and Chapter 5 presents results of the five case studies. A concluding chapter discusses some management and policy implications of the results.

CHAPTER 1: REVIEW OF LITERATURE

This chapter is concerned primarily with the history of land taxation around the world, focusing on the USA, Australia, Great Britain, South Africa and other selected countries in Central and Eastern Europe, Latin America, Asia and Africa.

1.1 A Brief History of Land Taxation Around the World

1.1.1 Introduction

To put the concept of a land tax into context, it is useful to first describe and discuss the origins and history of land and property taxation worldwide. Land and property taxes in various forms are said to be as old as human civilization itself, with an unbroken recorded history of at least 5000 years (BC Assessment, 2006: 1). This chapter traces the origins and uses of land taxes as far back as possible, noting of relevant rates and taxes used in different countries. The aim is also to track the progression and utilization of land taxes in diverse regions such as the USA, Britain, Hungary, Finland, Denmark, Australia and South Africa.

1.1.2 Global History of Land Taxes

Land taxes are one of the earliest forms of direct taxation, and formerly the chief source of government revenue, traceable back to the ancient Chinese and Egyptians (University of Liverpool, 2006: 1). The Egyptian use of land taxes can be traced back to 2400 BC, where land tax exemptions were made for temples and tombs of patrons and landowners of the day (BC Assessment, 2006: 3). However, land taxation really came into being under the Roman Empire, which relied heavily on such taxation for government funding in the fourth century BC (BC Assessment, 2006: 1). A fitting quote from the Roman Emperor of the time, Tiberius Gracchus, describes how land ownership was viewed in Roman times (George, 1953: 150):

"Men of Rome, you are called the lords of the world, yet have no right to a square foot of its soil. The wild beasts have their dens, but soldiers of Italy have only water and air."

Modern day land tax systems apparently began in England, stemming from the Middle Ages, where William the Conqueror completed an inventory of the nation's wealth, including farm animals (Wikipedia, 2006a: 1). This provided a basis for a tax on wealth, where British tax assessors used ownership or occupancy of property to estimate taxpayers' ability to pay this tax.

1.1.3 A Brief History of Land Taxation in the USA

1.1.3.1 Pre-20th Century Land Taxation in the USA

Land taxation in the USA can be traced back to before the Revolutionary War that began in 1763, where certain colonies had "well-developed tax systems" (Fisher, 2002:1) that financed a war against Britain. Tax structures varied from colony to colony, with four kinds of taxes being used most commonly: (i) Capitation (poll) taxes levied at a fixed rate on all adult males; (ii) Property taxes specifically levied at fixed rates on enumerated items; (iii) Faculty taxes levied on the faculty or earning capacity of persons following certain trades or having certain skills; and (iv) Tariffs levied on most imported or exported goods (e.g. alcohol) (Fisher, 2002: 3).

Land taxation was conducted at a fixed rate per-acre basis, which most patrons saw as unfair and subsequently demanded that taxation be based on property value. After the USA gained independence from Britain, land continued to be taxed in a variety of ways, with only four states as of 1796 taxing property on its valuation. However, gradually through the next century, states started to adopt land taxation on a value or *ad valorem* basis with 33 states taxing land in this way by the turn of the 20th Century. The general property tax applied at this time was on all wealth: real and personal, tangible and intangible (i.e. skills that a particular person may have, thereby making that person liable for a larger tax portion as their ability to pay was greater). It was administered by elected

local officials who determined market value and computed the tax rates necessary to raise the amount levied (Fisher, 2002: 3). This was the chief method of collecting local revenue, amounting to some 25% of all state and local government receipts (University of Liverpool, 2006: 1). George (1953) believed that all taxes should be replaced purely by a land tax, imposed on the economic rent generated by land.

1.1.3.2 Post-20th Century Land Taxation in the USA

The USA land tax legislature has been refined since the 1800s, and is now considered one of the most progressive and up-to-date land taxation systems in the world. Considerable literature has been published on land taxation in the USA because nearly two-thirds of the USA's private land area is devoted to agricultural use. As of 1995, the land held by roughly three million owners or about 2% of the overall USA population. The top 5% of these landowners held over half of the area and a fourth of the value of this agricultural land (Wunderlich, 1993: 3).

At the time of the 1902 USA Census of Government, land taxes provided 45 % of general revenue received by state governments from their own sources, and 78% of local government revenues. That percentage declined steadily, falling markedly between 1922 and 1942 as new taxes were enforced, and has continued to fall in 1999 land taxes only provided 1.8% of general revenue to state governments, and 44.6% of local government revenues. Fisher (2002:7) notes that the decline in the revenue importance of the property tax is more dramatic when the increase in federal aid is considered, as in the fiscal year 1999, where local governments received $228 billion in property tax revenue and $328 billion in aid from state and federal governments.

Each state in the USA is responsible for how a property tax is managed and implemented, and various methods are used to tax property. For example the market-value assessment of land versus the use value assessment which estimates the market value of a property in its current and possible future uses (Giertz, 1993 cited in Wunderlich, 1993: 140). Boldt (2002) analyzed use value assessment in Wisconsin and its effect on agriculture, and

found that if use-value based taxes are lower than market-value based taxes, the difference is capitalized into higher land prices. She notes that with use-value assessment (Wisconsin changed from market-value assessment to use-value assessment in 1995) land taxes as of 2002 were 18% of what they would have been under a market-based assessment (see Figure 1.1, Chart 1, 2 and 3). The 2002 property tax per acre was $4.41 under use value, compared to $24.10 with a market-based assessment. The nominal cumulative savings in net agricultural land taxes over 1996-2002 was about $767 million to Wisconsin farmers.

Gaffney (2000) and Young (1996) agree that land tax revenue is declining as a percentage of local tax revenue in the USA. Gaffney (2000) showed that average national property tax rates reached a high of 1.32% in 1930, falling to roughly 0.77% in 1945, and settled at around 0.85% from 1987 onwards. He notes that revenues from land taxes dropped below revenues from sales and income taxes (Gaffney, 2000: 1). Young (1996) notes, however, that Montana was well above the national average with a tax rate of 3.86%. Despite this, the land tax only contributed 17% of Montana's local government tax revenue (Young, 1996: 2). Land taxation and valuation assessment can be aided by technology changes, with many USA states now using computer assisted mass appraisal (CAMA), which combines computer technology and statistical methods to make property assessments (Fisher, 2002: 6).

1.1.3.3 Role of Subsidies in USA Land Taxation

When considering the tax rate or method of land taxation that a farmer in the USA incurs, the benefits that farmers receive from either their local or federal government should also be taken into account. Wunderlich (1992) notes that all 50 states in the USA in 1992 had some form of legislation that favours agricultural or open space use of land through modifications of the property tax. These modifications were essentially subsidies to maintain agricultural land use or slow the pace of transition to other uses (Wunderlich, 1992: 352). However these subsidies are formed or carried out, and regardless of the

effect on ultimate land use, the distribution of wealth among taxpayers and between the public and private interest in land will be affected (Youngman, 1993).

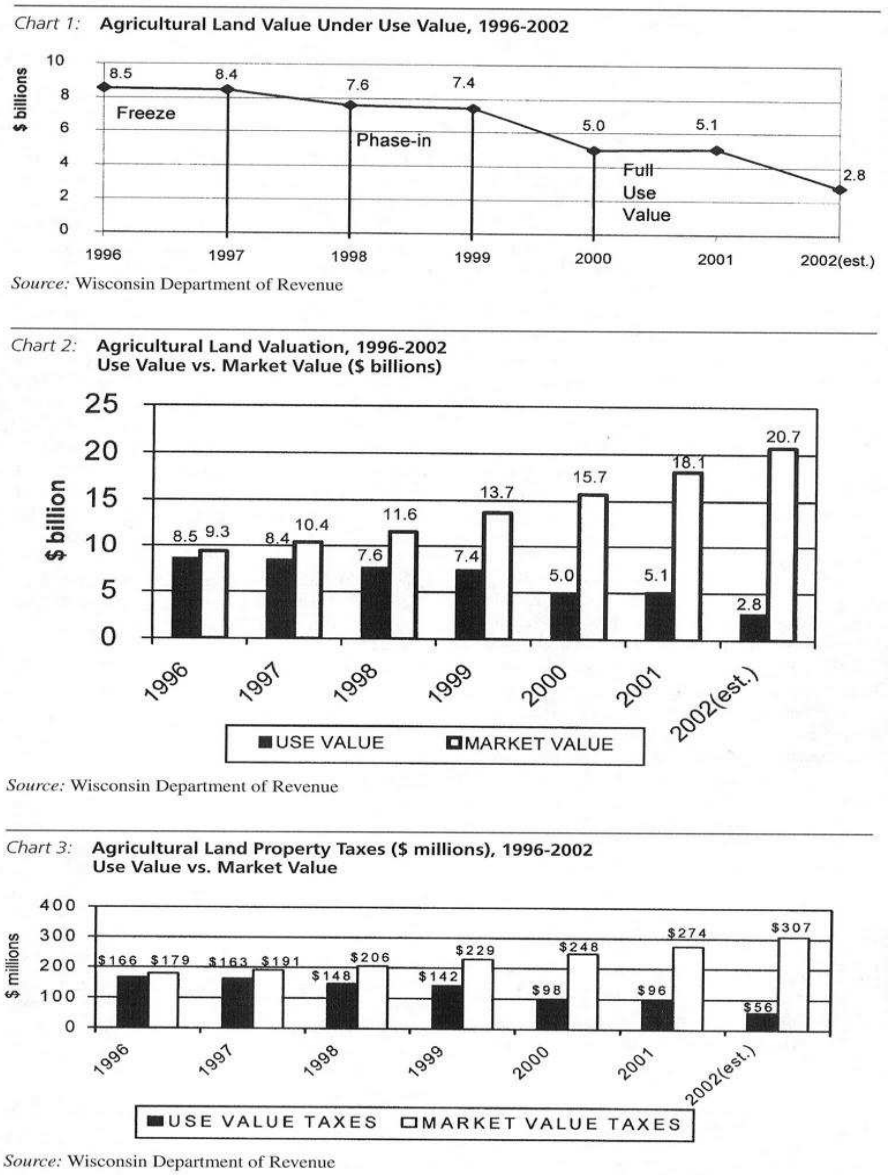

Figure 1.1: Wisconsin Agricultural Land Value and Property Tax Trends, 1996-2002

Source: Wisconsin Department of Revenue (2001; cited in Boldt, 2002: 168).

Despite this, in some USA states the cash rentals on agricultural land are entirely consumed by property taxes; farmland values in those states are driven solely by their development potential. Wunderlich (1992:351) states that, “for agricultural land to compete successfully with non-agricultural land, a subsidy of more than twice the entire amount of real property taxes now collected from farmland in the USA would be required”.

1.1.4 Brief History of Land Taxation in Australia

Land taxes were first levied in Australia in 1885, roughly around the time that Henry George published *Progress and Poverty*. These taxes were firstly administered in Southern Australia, and then the rest of Australia by the start of the 20th Century (South Australian Parliament, 2005: 1). Archaic assessment methods and legislature have created many ways to avoid a land tax: for example, in New South Wales (NSW), concessions are five times greater than what they receive in land taxes. Revenue from land taxes generally only accounts for some 5 % of state tax revenue (Smith, 2000: 9).

Land tax in Australia is payable by the owner of land on the taxable value of all the land owned by that person that is not exempt from taxation (as applies to a church, hospital or recreational facility). Australian land taxes do not take improvements into account when calculating a taxable figure (Simpson and Figgis, 1998: 1). Most Australian states follow a similar structure of taxation, as each property is valued yearly by the Valuer General’s Department and then processed by the Office of State Revenue. Table 1.1 overleaf shows the land tax structure that is applied in NSW and how it operates. Traditionally land tax rates in Australia have not exceeded 1.85% or fallen below 1.65% of taxable land value (Simpson and Figgis, 1998: 1).

Table 1.1: Land Tax Structure in New South Wales, Australia, 2005

Site Value of Land ($ Australian)	**Marginal Land Tax Rate**
$0 to $110 000	Nil
$110 000 to $350 000	0.3%
$350 000 to $550 000	$720 + 0.7%
$550 000 to $750 000	$2 120 + 1.65%
$750 000 to $1000 000	$5 420 + 2.4%
Above $1000 000	$11 420 + 3.7%

Examples of land tax calculations for the NSW case in Table 1.1 are:

1) Property worth $110 000

Tax on first $110 000 = Nil

Therefore, total land tax payable = Nil.

2) Property worth $ 200 000

Tax on first $110 000 = Nil

Tax on $110 000 to $200 000 @ 0.3% = $270

Therefore, total land tax payable = $270.

3) Property worth $400 000

Tax on first $110 000 = Nil

Tax on $110 000 to $350 000 @ 0.3% = $720

Tax on $350 000 to $400 000 @ 0.7% = $350

Therefore, total land tax payable = $1070.

Source: (South Australian Parliament, 2005: 1).

1.1.5 Brief History of Taxation in Great Britain

Modern day land tax systems in Great Britain can be traced back to those in medieval England brought about by William the Conqueror. The first land tax, called the *geld,* began in the late 10th Century to raise tribute money for the Danish invaders and continued until the mid-12th Century (Medieval Genealogy, 2006: 1). The *geld* was then replaced by the *carucage*, initially levied to pay the ransom of King Richard the First. Few records of these land taxes exist, but they were replaced by alternative taxes late in the 13th Century. Land taxation in Britain continued in this way until the late 1700s with the advent of Adam Smith and his rationalization of the taxation system, and into the mid-1800s with the ideas of Henry George (Lichfield and Connellan, 1997: 8).

Historically, property rates in Britain were local taxes raised for local government revenues that were levied on the occupiers of owned property. The basis of assessment was the annual market value of the land and buildings in occupation. Traditionally in Britain the amount of revenue required from taxation was first decided and this total liability was then distributed among the taxpayers, or ratepayers. The rate was traditionally found by dividing the sum to be raised by the aggregate rateable value of the area. Thus, the basis of assessment is the rateable value of land and buildings and, with some exceptions, each property in a rating area has a rateable value, which is derived from its yearly letting (rent) figure (Lichfield and Connellan, 1997: 8).

The trend in Britain is towards the introduction of Site Value Rating (SVR) or Land Value Taxation (LVT) as a replacement for the existing rating and council tax systems. This form of SVR/LVT encompasses a dual function of revenue gathering for local services and the recoupment of development value. It shifts the existing local services burden away from occupiers as a direct charge to owners (Lichfield & Connellan, 1997: 47). However, exceptions have been made so that certain types of land can be exempt from the SVR/LVT, such as agricultural land. Mclean (2004: 13) notes that were LVT to be used in Britain, it would be easier to administer and less regressive because it does not distort the incentives to develop land.

1.1.6 Brief History of Land Taxation in Hungary, Finland and Denmark

1.1.6.1 Land Taxation in Hungary

From 1917-1921, according to the Budapest decree, an annual tax of 0.5% was levied on all land values, whether the land was used or not. The only exemptions were made for publicly-owned land sites, and valuations were made every three years (Konya, 2000: 261). The years 1921-1947 were seen as "Land Reform" years in Hungary, where large tracts of land were redistributed to landless peasants (roughly one million acres) with another 400 000 acres being given in tenure and lease. During these years, no attempt was made to revive the land tax system that had been put in place according to the Budapest decree. From 1948 to 1989, Hungary was under communist rule where the state and co-operative structures owned the farmland; therefore, there was no physical form of land taxation. In 1988, the ruling party instituted another land tax based on periodically reassessed market value, but this "stressed the legal restitution to all those who were cheated out of their possessions by the Communist regime, and was later silently disregarded" (Konya, 2000: 265). Currently, the local municipalities still have the ability to control the tax system in their region, including the taxation of land. However, since there is no formal legislation, this taxation of land depends solely upon the decision makers at local government level.

1.1.6.2 Land Taxation in Finland

In Finland (as in most other Nordic countries), municipalities have a central and strong position in the administration system. This position is accentuated by the municipality income and property taxes (Virtanen, 2000: 212). Up until 1968, agricultural land was taxed according to its estimated annual average yield. However, after 1968, a law was passed that agricultural land was only to be taxed on an income basis. The assessed value of agricultural land is determined by a calculation that has no real connection with actual market value, but is much lower; in practice, the taxable value of agricultural land is

about 5% of market value (Virtanen, 2000: 215). Finnish farmers do, however receive large subsidies from national government that are known as tax relief.

1.1.6.3 Land Taxation in Denmark

Denmark was apparently the first country in Europe to put into practical operation the taxation of land values, and the first country in the world that had a resident political party of national influence whose chief aim was to make land value the principal and, if possible, the only source of tax revenue in the country (Lefmann and Larsen, 2000: 185). Land taxation in Denmark is traceable as far back as the reign of Viking king Valdemar the Great (1157-1182). Some records show that land taxation in Denmark could go as far back as the middle of the 9th Century.

In 1922, the national general property tax was separated into two taxes, one on the value of land alone, and the other at a lower rate, on the value of improvements. By 1948 Georgist ideas had attained sufficient influence that the Danish government appointed a commission to consider full taxation of land values with corresponding reduction of taxes on industry (Silagi, 1994: 497). Since 1916, the values of land and improvements were separately assessed with general assessment being made every four years. Land taxes as a percentage of all taxes in Denmark decreased from 5.2% in 1950 to 1.5% in 1997. Ultimately the proponents of Henry George failed in their attempt to impose land taxation as the only tax in Denmark. Municipalities in general are responsible for setting their own rates in Denmark, often imposing very high rates such as 7% on the market value of land. These high percentages have decreased over the years showing that land taxes as a percentage of overall tax revenue have fallen. Since 1950 the average land tax rate in Denmark has never exceeded 2.9%. However, the national average land tax rate over the period 1950-1997 roughly 2.0 %.

1.1.7 Brief History of Land Taxation in South Africa

Franzsen (1990), cited by Van Schalkwyk *et al*. (1994: 206), notes that a tax was levied on SA agricultural land as early as 1677 by the Dutch East India Company in the Cape of Good Hope. This tax was known as a "Tithe" (an agricultural income tax). A "quitrent", an annual rural land tax for the privilege of owning or occupying agricultural land or *recognetie*, was introduced in 1714 (Franzsen, 1995: 24). According to Theron (1994) cited by Van Schalkwyk *et al.* (1994: 206), Natalia (established in 1839, now known as KZN) had an economy that was mainly dependent on agriculture, which made a land tax an important source of income to the then local government. The first tax on agricultural land was introduced in 1839 and then a parliamentary decision on 14 April 1841 made provision for a progressive land tax. Land taxes were also prominent in the then Orange Free State and Transvaal areas. These rural land taxes constituted a large portion of the local government revenue, amongst other land related taxes such as transfer and hut taxes. However, these colonial land taxes were abolished by the Union Parliament under the Abolition on Quitrent Act, Act 54 of 1934 (Franzsen, 1995: 24).

Van Schalkwyk *et al.* (1994: 206) and Franzsen (1995: 24) note that since 1910 (when the Union of South Africa was established) most agricultural land taxes have been abolished. A land tax in the form of a divisional council levy in the former Cape Province was the last to be abolished, in 1986/1987. Land taxes were replaced by taxes such as a transfer duty tax (at a maximum rate of 8% on the values of immovable property exceeding R250 000) and value added tax (levied at a standard rate of 14%). Local municipalities in South Africa have traditionally rated urban areas, as a property tax was an important local tax, even during the apartheid era from 1948-1994. This rating of residential, urban and industrial property has continued under the present government that has now made provision for a rural land tax under the new LGMPRA No. 6 of 2004, hoping to increase local government revenue by rating previously unrated farm land (McCluskey and Franzsen, 2004: 5).

Prior to 1994, all urban municipalities in the then four provinces of South Africa (Cape, Natal, Orange Free State and Transvaal) levied property rates, with the majority of the burden falling upon white South Africans (McCluskey and Franzsen, 2004: 7). Farmland faced no form of property taxation, unless it fell within an urban municipality's boundaries. After the 1994 elections, the four provinces were split into the present nine (KZN, Free State, Western Cape, Northern Cape, Mpumalanga, North West, Gauteng, Limpopo and Eastern Cape). December 2000 saw a large change in the structure of local government in South Africa with the amalgamation and restructuring of all the municipalities. The current structure is: 283 municipalities in total, split as 6 Metro councils, 46 District Councils and 231 Local Councils encompassing the whole of South Africa (South African Municipalities, 2006).

1.1.8 Present Land Taxes in Selected Organization for Economic Cooperation and Development (OECD), Central and Eastern European, Latin American, Asian and African Countries

Table 1.2 outlines and comments on land tax bases and tax rates in different countries in the OECD, Central and Eastern Europe, Latin America and the Caribbean, Asia and Africa. Darroch (2003: 16) notes that a range of tax bases is used on which to levy land taxes for farm land; these include land only, land and FI, land and buildings, land and structures, land and buildings separately with different tax rates, and in a few cases, land, FI and machinery. Land and fixed improvements is commonly used as the tax base (as now in South Africa), implying that the definition of the land tax base used in the LGMPRA of "improved value" denoting buildings and structures is similar to tax bases that are applied in other countries (Darroch, 2003: 16).

Table 1.2 outlines and comments on the farmland property tax bases and tax rates in countries for which this information was readily available as of 2002. The effective rate

Table 1.2: Land Taxes in Selected Countries Around the World, 2002

Region/Country	Farmland Property Tax Base	Property Tax Rate (Reference date)	Comments
OECD[a] Countries:			
USA	Land & FI[b]	<1% (1909-2001)	
Australia	Land or land & FI	Nil, exempt or exempt with conditions	Rates often reduced at local discretion
Canada	Land & FI (sometimes machinery included)	0.25-0.28%	In most provinces, farm properties are favoured in the assessment system
Germany	Land, FI & machinery & livestock	0.6%	
Japan	Land & FI	Usually 1.4%	
New Zealand	Land or land & FI	<1%	Widespread differential rating (e.g. Farms near Wellington pay 50% of residential rate)
United Kingdom	Land & FI	Exempt	
Central & Eastern Europe:			
Hungary	Unimproved value for land tax; Separate buildings tax	Maximum of 1.5% for land & 3% for buildings	Some exemptions
Latvia	Land & buildings	1%	
Poland	Land, buildings & structures	Variable amount per ha	Separate taxes on agricultural land & forests
Russia	Land for land tax; structures for property tax	Variable amount per ha	Very limited land market
Ukraine	Land	0.1-1%	Tax rates depend on use of land & fertility
Latin America & Caribbean:			
Argentina	Land & buildings	Approximately 1.2%	Additional 1-9% rate for tax bases > annually set threshold
Chile	Land & FI	2%	Some exemptions (e.g. land with forest management plan)
Colombia	Land & buildings	0.4-1.6%	
Jamaica	Land	Progressive rate starting at 6%	50% exemption for agricultural land
Mexico	Land & buildings	0.07-0.33%	

Notes: [a] OECD = Organization for Economic Cooperation and Development.

[b] FI = Fixed improvements.

Table 1.2: Land Taxes in Selected Countries Around the World, 2002 (continued)

Region/Country	Farmland Property Tax Base	Property Tax Rate (Reference date)	Comments
Nicaragua	Land & FI	0.8%	
Asia:			
China	Occupied land; Land & FI	Farmland occupation tax per unit area	Occupation of State/communal land
India	Land & FI	Included in "all-in" services fee	
Indonesia	Land & buildings	0.5%	
Philippines	Land, FI & machinery	0.25-2%	Taxed at higher % of assessed value than residential land
Thailand	Land & FI	0.25-0.5%	Lower rate for land used for annual crops
Africa:			
Botswana	Land & FI	0.2-0.8%	Agricultural properties are now a separate category with much lower rates
Namibia	Land	0.5%	Rate progresses at 0.5% for each additional farm under ownership
Guinea	Land & buildings	-	Agricultural land not taxed
Kenya	Land (can use land & FI)	Farm product sales tax substitutes for land tax	If taxed, typically on the basis of area, not value
Lesotho	Land & FI	Nominal land rental	No freehold title to land
Swaziland	Land or land & FI, or FI	-	Rural areas exempt
Tunisia	Land or land & FI	-	Agricultural land not taxed
Tanzania	Buildings, structures or limited developments	Farm product sales tax substitutes for land tax	Rural property not taxed (belongs to the State)

Source: Darroch (2003: 17)

of property tax in the OECD countries cited is under 1%, except for Japan (1.4%). In the Central and Eastern Europe nations quoted, the effective rate after exemptions ranges from well below 1% to not much more than 1%.

Effective tax rates in the selected Latin American and Caribbean countries are between 0.07% and 3% after accounting for exemptions applicable to farmland. The nations reported from Asia levy property taxes ranging from 0.25% to 2%, with the tax in India forming part of an “all-in” service fee. In the African countries, agricultural land is currently only taxed in Botswana and Namibia, at a rate below 1%.

Chapter 2 will outline the economic effects of a land tax, including the advantages and disadvantages, and the capitalization effects, of a land tax. It also considers three different views of land taxation, namely the traditional, capital, and benefit views, approaches to land taxation and land valuation methods.

CHAPTER 2: ECONOMIC EFFECTS OF A LAND TAX

This chapter outlines the economic effects of a land tax on land rents and investment and then considers the capitalization and incidence of a land tax. It concludes with a discussion of approaches to land taxation and land valuation.

2.1 Effects of a Land Tax on Land Rents and Investment

Nieuwoudt (1995, citing Pasour (1975)) notes that a rural land tax on the improved value of land (in the long run) falls on new investment and as such will be a disincentive to future investment in land improvements. A tax on unimproved land falls entirely on land rents, as in the classic Ricardian case, where the supply of land is assumed to be totally inelastic. Such a tax does not increase or decrease the use of land and is not a disincentive to production. Figure 2.1 shows the effects of a land tax on land rents and the quantity of improved land in the short run. Farmland is similar to other capital investments, as it requires initial development and subsequent maintenance (Pasour, 1975). However, changes in capital investment in agriculture are likely to be small relative to the quantity of land and improvements, implying a relatively inelastic long run supply of improved land.

Where the initial supply of improved land in the market (before a land tax) (S_1) and the demand curve intersect, rents are equal to R_0 and the quantity of improved land is Q_0. If a land tax is levied, supply shifts from S_1 to S_2 and the quantity of land and improvements decreases (or does not increase as rapidly as it might have) from Q_0 to Q_1. Therefore, by reducing investment in new improvements, the land tax will reduce future food production or export earnings, and increase food prices in the long run. Given that a land tax in terms of the LGMPRA in South Africa is to be levied as a percentage of the market value of that land, it is shown as a proportional backward shift of the supply curve. The result is a slightly higher annual rent from R_0 to R_1, which implies that not all of the tax is capitalized into lower land values, but is partly shifted (R_1-R_0) onto consumers in the form of higher food prices (Nieuwoudt, 1995: 87).

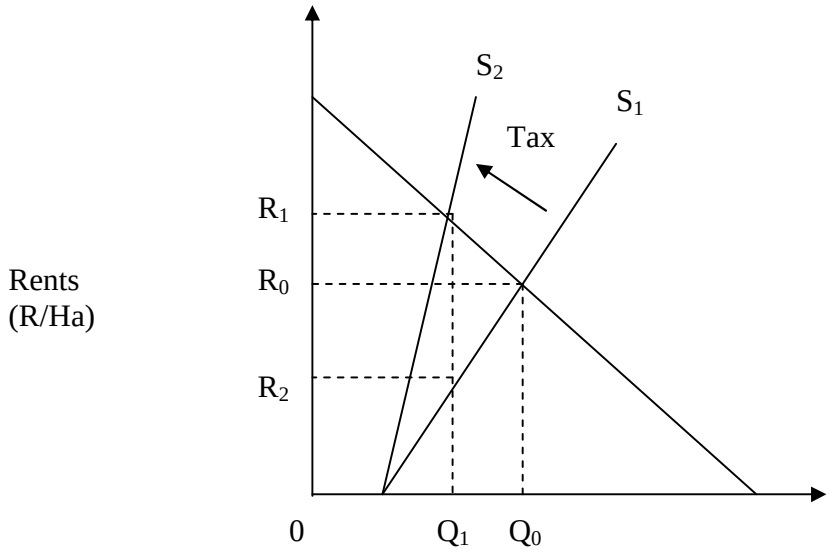

Figure 2.1: Effects of a Land Tax on Land Rents and Quantity of Improved Land.

Source: Nieuwoudt (1995: 86), adapted from Pasour (1975).

At Q_1, the amount of the land tax is R_1-R_2 per hectare. Subtracting this amount from R_1 gives R_2 as the rent per hectare *net* of the land tax that landlords can expect in the long run. R_2 per hectare is *less* than the rent of R_0 per hectare without the tax, where R_0-R_2 is borne by land owners because the land tax is capitalized into lower land values. Since current rents on land are partially returns to past investment, some tax will fall on expected future investment in land. The result is a negative impact on new investment in farm land. This factor negates the argument that a land tax will bring idle land into use as theoretically even if a land tax is wholly capitalized into lower land values, rents and hence the demand for land will decrease accordingly (Nieuwoudt, 1995).

In addition to the implementation of a land tax being a disincentive to future investment, Nieuwoudt (1995), Van Schalkwyk *et al*. (1994) and Lindholm (1972) also identify the following disadvantages of a land tax: (a) administration is costly as all properties need to be appraised individually and regularly; (b) in practice it is almost impossible to exclude

all improvements from the tax; (c) the tax is a flat rate tax and not progressive; and (d) the tax is the same in good (relatively higher income) years and bad (relatively lower income) years during a given valuation cycle, although it may be possible to defer the tax and incur interest charges. Point (d) is very important as it highlights that the land tax is a fixed cost as it cannot be shifted and has to be paid by the farmer regardless of performance or what is produced on the farm (Olsen, 2004: 87).

Against these disadvantages, Nieuwoudt (1995), Van Schalkwyk *et al*. (1994) and Franzen (1995) identify the following as advantages of a land tax: (a) evasion and avoidance are not possible; (b) farmers need not keep records on costs and incomes as required for Value Added Tax (VAT) and income tax reporting; (c) it is a wealth tax; and (d) it may more effectively tax the wealthy landowner who with the assistance of tax experts can implement strategies to avoid income taxes.

2.2 Capitalization and Incidence of a Land Tax

There is much debate about the capitalization of a land tax, and the economic incidence of a land tax (i.e. who actually bears the land tax). These two facets are linked, in that the economic incidence of any tax is affected by the capitalization of that tax. Capitalization of a land tax is defined as "changes in asset prices that reflect the discounted present values of the economic effects of future tax and/or public expenditure changes" (Zodrow, 2006: 1). There is also debate as to whether a land tax is a benefit tax or a capital tax.

2.2.1 Capitalization of a Land Tax

Pasour (1975), Nechyba (2000), Barry *et al.* (2000), and Zodrow (2006) all note the effect of land tax capitalization on land values and how this affects the debate about whether the land tax is a benefit or capital tax. Pasour (1975: 539) quotes Netzer (1966) and Jensen (1931) who both conclude that there is strong evidence of capitalization of land taxes into *lower* property prices as both found that increases in land taxes led to

corresponding decreases in farm values. This conclusion was also stated in a later USA study by Pasour (1973) in North Carolina.

In the classic case of land in perfectly inelastic supply, a tax is fully capitalized and merely serves to reduce land rent (Pasour, 1975: 540). However, tax "shifting" is possible under competitive conditions, providing the supply of land and improvements is not perfectly inelastic, i.e. if the quantity of improved land is reduced when the tax is imposed. The supply of farmland is not likely to be perfectly inelastic (as more land can be opened and used for farming, by means such as clearing, drainage etc.), and farmland is similar to any other capital investment as it requires subsequent maintenance. Figure 2.1 on page 20 shows the effect of an increase in land taxation on this highly inelastic supply curve as a proportional inward shift.

Pasour (1975) notes that the present market value of farmland is the capitalized value of the expected annual land rents from that land. When a land tax is levied, Figure 2.1 shows that a small part of the tax ($0R_1$-$0R_0$) is "shifted" to consumers, while most of the tax is capitalized into lower land values. Pasour (1975) estimated a regression of the value of farmland on the land tax rate and other variables hypothesized to be associated with changes in the price of farm real estate, namely agricultural productivity, farm size and urban influence. He showed that an increase in tax rate of \$0.10 per \$100 (0.1%) of the full market value of farmland led to a decrease of \$6.37 per acre in farm real estate prices (Pasour, 1975: 542).

The capitalization process can be explained using a simple asset valuation model shown by equation (2.1). The basic valuation approach is to estimate the current market value of land (V_0) by capitalizing its flow of expected future annual earnings (R_0) at an appropriate interest (or capitalization) rate (i_t) (Barry *et al.*, 2000: 347):

$$V_0 = R_0 / i_t \qquad (2.1)$$

This expression means that the land value V_0 is estimated by dividing the expected annual real earnings (rents) R_0 by the real capitalization rate, i_t. Barry *et al.* (2000) note that i_t is approximated by subtracting the anticipated inflation rate from the nominal

market interest rate, “thus, the land’s present value is essentially found by dividing the current rent by the difference between a market interest rate and an inflation premium” (Barry *et al*., 2000: 347). If the land is expected to increase in value at the general inflation rate, market equilibrium gives the total annual return (i) to investors as a real rate-of-return ($i_t = R_0/V_0$), plus a nominal rate of capital gain (i_f) in equation (2.2):

$$i = i_t + i_f = R_0 /V + i_f. \quad (2.2)$$

There are, however, a number of problems with equation (2.1). It can determine V_0 if the expected real earnings of land remain constant in perpetuity and the capitalization rate is known: “this ostensibly simple process is always made difficult by problems associated with determining the correct capitalization rate, measuring the correct perpetual residual to be capitalized, determining what to do with contract rents, and several other problems” (Barkley 1993, cited in Wunderlich 1993: 91). If the annual real rents of land are expected to grow over time at rate g, the real g is approximated as the difference between the nominal expected g and the inflation rate. Barry *et al.* (2000) note that real growth in an asset payment series partitions the real rate-of-return into two parts: (1) a current real return and (2) a real capital gain. This leads to a constant growth model (providing the expected g stays the same) shown by equation (2.3):

$$V_0 = R_0 (1 + g) / (i_t – g) \quad (2.3)$$

where i_t is the expected real interest rate. It is vital to ascertain the extent (percentage) to which the land tax is capitalized, as some of the land tax may be offset by higher R_0 due to different services financed by the land tax (e.g. roads). The land tax may thus only partly be capitalized into lower land values. Reworking equation (2.3) leads to equation (2.4):

$$i_t – g = R_0 (1 + g) / V_0. \quad (2.4)$$

Equation (2.4) implies that:

$$(i_t – g)/ (1 + g) = R_0 / V_0. \quad (2.5)$$

Equation (2.5) implies that there is a constant ratio between the expected annual rent R_0 received from land and the actual value of land (V_0). It implies that if R_0 decreased/increased, there would be a proportional decrease/increase in (V_0). Nieuwoudt (1987: 10) and Ortmann (2005: 295) both state that the rental rate of return for land in SA agriculture is about 5%, where the rental rate is defined as "cash rents of farm land divided by land value" (Nieuwoudt; 1987: 10). Ortmann (1987: 249) states that rents indicate the true profits realized after considering all costs, including risk and management, where rent is the "payment made per unit of time to owners of property for the use of their land and buildings".

Extending these comments to equation (2.5) implies:

$$R_0 / V_0 \approx 5\% \qquad (2.6)$$

or that annual rent (R_0) is about 5% of land value (V_0). Examining the effect of a 1% land tax, this suggests that full capitalization causes R_0 after tax = 5% - 1% = 4%, and, therefore that R_0 drops by 1/5 = 20%. A fall in R_0 from, say, R100 to R80 (20% fall), means that V_0 falls from 100/0.05 = 2000 to 80/0.05 = 1600 or 400/2000 = 20%.

Land values are thus expected to fall by the same percentage as land rents if a land tax is fully capitalized into lower land values. However, section 2.1 above suggests that the land tax is not likely to be fully capitalized into lower land values as a small share of the tax is "shifted" to consumers in the form of higher prices due to less future investment in improvements. In addition, if land tax proceeds are used for the improvement of municipal infrastructure, such as the upgrading of roads, R_0 and V_0 would rise, thereby partially offsetting the fall in net rent and V_0 caused by the land tax (Pasour, 1973; Nechyba, 2000; Zodrow, 2006). The capitalization of expected rents into lower expected land value implies that the RIM framework described in Chapter 4 must account for the negative impact of the land tax on annual current rental or operating returns to land (excluding capital gains on land).

2.2.2 Views on the Incidence of a Land Tax

Nieuwoudt (1987: 11) notes that taxes can be levied on the "benefit approach" or the "ability to pay" approach. Under the benefit approach, consumers are taxed directly in relation to the amount of benefits they receive from the government, while under the ability to pay approach, the wealthy are taxed more. However, Zodrow (2001) notes that professional opinion on the incidence of the tax is generally divided between the 'benefit tax' view and the 'new' or 'capital tax' view. The aim of this section is to compare these views of the incidence of a land (property) tax.

2.2.2.1 Benefit Tax View of the Land Tax

The benefit view of property taxation was initially developed by Hamilton (1975), Fischel (1975) and White (1975), as an extension of the Tiebout (1956) model of local government, which argues that "consumer mobility and interjurisdictional competition in the provision of local public services are, under certain conditions, sufficient to ensure efficiency of resource allocation in the local public sector" (Zodrow, 2001: 3). Under the benefit tax view, a property or land tax is considered a *user charge* for public services received. The implications for tax payers are threefold; firstly, as a benefit tax the property tax is simply a payment for public services received; secondly, because the property tax functions as a market price, its use implies that local public services are provided efficiently; thirdly, the property tax, like all benefit taxes, results in no redistribution of income across households and thus has no impact on the distribution of income (Zodrow, 2006: 2).

The crux is that a benefit tax causes no efficiency loss and satisfies the widely held principle that people who benefit from a service should pay for it (Carroll and Yinger, 1994: 295). The problem with a property tax is that it needs to fit certain criteria to be considered as a benefit tax. One necessary condition is that those who bear a higher property tax burden than others in the same jurisdictional area must receive correspondingly higher benefits from public services. Nechyba (2000: 3) notes two other key assumptions of the benefit view of the property tax: firstly, households must be

potentially mobile across jurisdictions (thus giving rise to the potential of capitalization); secondly, that local governments must employ strict zoning in order to produce the capitalization that is desired by local homeowners. Put differently, the benefit view requires mobility of households and immobility of the housing stock through zoning regulations that lock in current houses and limit the building of new ones. Furthermore, while the property tax itself is efficient under this view (because of the immobility of housing), the overall outcome for the whole economy is generally not efficient (as supply is artificially restricted in order to keep rents to homeowners high). Full efficiency would in fact demand no capitalization in equilibrium as new communities would form or housing would be added to existing communities to satisfy the demand for desirable local features that is expressed through capitalization. In the context of the LGMPRA the extent of the capitalization of a land tax into lower farmland values in SA depends on the extent to which the fall in land rents is offset by potential increases in land rents due to the provision of (improved) municipal services.

2.2.2.2 Capital Tax View of the Land Tax

The capital tax or 'new' view was derived by Mieszkowski (1972) and elaborated by Zodrow and Mieszkowski (1986). Zodrow (2001: 2) argues that the property tax is a distortionary tax on the local use of capital, which results in a misallocation of the national capital stock across local jurisdictions. The capital tax view divides the incidence of the property tax into two components: the national average tax burden is in effect a "profits tax" borne by all capital owners, including homeowners, businesses and investors; and the local or "excise tax" components of property tax rates that fall above or below the national average are borne locally through changes in land rents, wages, or housing prices (Zodrow, 2006: 3). It is maintained that the incidence effects of local taxes that are higher or lower than the national average tend to cancel one another out in the aggregate. Therefore, the "profits tax" effect is the main factor determining the incidence and distributional effects of the property tax.

The capital tax view has different implications for taxpayers in all three of the areas noted above for the benefit tax view. Firstly, the tax may have some significant benefit aspects in that local tax increases tend to mostly be borne by local residents, so the incidence falls on the right consumers. Secondly, the tax can distort housing consumption decisions; moreover, the local property tax can also lead to under-provision of local public services if government officials, concerned about a tax-induced loss of investment, then reduce the level of public services (Zodrow and Mieszkowski (1986) cited in Zodrow (2006: 3)). Thirdly, Zodrow (2006: 3) states that because the primary effect of a nationwide (as in the USA) use of a property tax is a reduction in after-tax returns to capital owners, it is a highly progressive tax.

2.3 Approaches to Land Taxation and Land Valuation Methods

The literature review in Chapter 1 shows that there are many ways of taxing agricultural land and many versions of land taxes. Some are more obscure than others but have been found plausible in certain situations. This section briefly discusses different approaches to land taxation, and then considers different land valuation methods.

2.3.1 Approaches to Land Taxation

An annual land tax may be levied on the capital value of land or on the value of land plus fixed improvements (as in the LGMPRA in South Africa). Secondly, the gross income from land could be taxed, or, taking into account some allowance for expenses, a tax may be levied on some net income realized from land. Thirdly, the tax could fall on a land classification scheme - for example, on factors such as the use of irrigation or potential thereof. Fourthly, a periodic tax could be levied on increments of land value. Finally, transfers of agricultural land could be subjected to special taxation or else fall within the scope of more general taxes on wealth transfers (Bird, 1974: 37). Most countries use at last one or two of these approaches when taxing land, yet Bird (1974) noted that few developing countries by the early 1970's had effective land taxes of any sort due largely to the "universally weak valuation systems" (Bird, 1974: 37). Franzsen (1995: 27) notes

that establishing the taxable value of land is one of the most problematic and technical aspects of the implementation of a rural land tax.

2.3.2 Land Valuation Methods

This section briefly reviews the main valuation methods that can be used to estimate farm land value when there are sufficient open market sales; where a distinction must be made between market value and use value. “Market value” is the price a willing buyer would pay in an open market for that piece of land. “Use value” is the value of the property when put to its best and potentially highest value use (Boldt, 2002).

2.3.2.1 Direct Site Valuing Method

This approach involves the assessment of land value based on the direct comparison of the identified land with other comparable land sales. It does not utilize a unit of comparison, but rather takes the land as a block or parcel with individual adjustments, according to parameters such as size, location, road frontage and topography being made holistically by the land valuer. This method is often used where there is a lack of market transactions or where a parcel or block is of a unique size. The main problem noted with this method, is that the value attained is very subjective according to the valuer and his/her relevant knowledge (McCluskey and Franzsen, 2004: 20).

2.3.2.2 Comparable Sales Method

This approach is very similar to 2.3.2.1 above, except that the market value of a farming unit is assessed by comparing it to similar units that have recently been sold by a willing seller to a willing buyer on the open market. There are a number of problems involved with this method: firstly, communal land that is under indigenous forms of tenure has no land market, and hence, no comparable form of sale. Secondly, even in established commercial farming sub-sectors, this method could be inaccurate due to the scarcity of farm sales and lack of homogeneity of types of farming enterprises that are sold (i.e.

comparing the price of a dairy farm will not give a seller or buyer a comparable price for a citrus farm) (Franzsen, 1995: 28)).

2.3.2.3 Land Area Method

This method is similar to the comparable sales method, where the value of land is related to its size, current/or highest and best value use, and valued on a unit comparison. The unit of comparison can be price per square meter or per hectare/acre; however, differences between individual properties can result in widely different prices per unit. Such differences tend to arise from factors like road frontage, presence of water, sewers and drainage, contours, soil quality, developmental capabilities and land use zoning. Therefore, it is important to be aware of property uniqueness and be able to identify and quantify the factors contributing to property value (McCluskey and Franzsen, 2004: 20)

2.3.2.4 Income Capitalization Method

Franzsen (1995: 28) notes that this method is often used to determine the "agricultural value" of land. This method is based on the net farm income (NFI) being divided by an appropriate capitalization rate, aiming at establishing the alleged agricultural use value of agricultural land. For the method to be reliable, realistic net farming income and capitalization rates need to be utilized. Proponents of this method note that the main advantage is that it is based on income and not wealth, and so is better suited to a taxpayer's ability to pay. Land values estimated by this method are usually lower than market values, which could lead to inequitable tax treatment if the non-agricultural sector is taxed according to market value.

However, this method does have severe limitations, since it assumes that:

$$V_0 = NFI_0 / i_t \qquad (2.7)$$

This means that no annual growth in NFI is taken into account, thereby understating (V_0) or value of land that is being calculated (Nieuwoudt, 1986). Despite this, Franzsen (1995:

28) notes that the Land Bank in South Africa has used this method for many years, not only for the purposes of extending loans, but also to try and estimate estate duty and donations tax.

2.3.2.5 Lease (Rental) Value Method

This method assesses land value with reference to the (potential) market rent that could be obtained for the specific unit of land. As it refers to the potential rent, this method is a use value method. Franzsen (1995: 28) noted that about 20% of all agricultural land in South Africa is subject to lease. Although the lease value gives quite an accurate indication of the taxpayer's ability to pay the rural land tax, it has a number of shortcomings. Firstly, different rental rates for different areas could result in inaccurate assessments. Secondly, the lease market may not be competitive, as many leases are concluded between connected persons such as family members. Thirdly, many short -to medium-term leases on agricultural land are not well documented, implying that the information is not readily available or may be inaccurate. Fourthly, because information is supplied by taxpayers themselves, data manipulation is possible.

This Chapter implies that the RIM framework in Chapter 4 must estimate the annual return to land, and effect of a land tax on this return. It must also relate these values to the market value of improved land. Chapter 3 considers the key provisions of the LGMPRA and the DPLG proposals on land tax rebates as further background for the RIM framework.

CHAPTER 3: KEY PROVISIONS IN THE LGMPRA NO. 6 OF 2004 AND THE DPLG PROPOSALS FOR LAND TAX REBATES IN SOUTH AFRICA

This Chapter reports the key provisions in the LGMPRA pertaining to the valuation criteria and rating of agricultural land, determination of a rate of land tax and land tax rebates. It also describes the level of rebates for commercial farms in South Africa proposed by the DPLG GRPF (DPLG, 2004c).

3.1 Designation of Municipal Valuers and Method of Property Valuation

Before the date of valuation every municipality must designate a person as a municipal valuer who may be a municipal official or a person who is in private practice. If the valuer is in private practice, the municipality must receive tenders for the valuation process so as to follow an open, competitive and transparent process in accordance with Chapter 11 of the Municipal Finance Management Act. The primary function of the municipal valuer is to value all properties within the designated municipality and prepare a valuation role of all the properties within the municipality. This valuer must determine a "market value" for each property within municipal boundaries, where market value is defined in Section 46(1) of the LGMPRA as the "amount the property would have realized if sold on the date of valuation in the open market by a willing seller to a willing buyer" (DPLG, 2004c: 50). Professional independent valuers, in terms of Section 39 of the LGMPRA, must be persons registered as professional valuers or professional associated valuers in terms of the Property Valuers' Profession Act, 2000 (Act No. 47 of 2000) and know how to value properties using the "willing seller to a willing buyer" principle (DPLG, 2004a: 2).

In regard to commercial farms, Section 46(1) of the LGMPRA further states that "in *determining the market value of a property used for agricultural purposes*, the value of any annual crops or growing timber on the property that have not yet been harvested as at the date of valuation must be disregarded for purposes of valuing the property" (DPLG,

2004a: 50). According to Section 48(1)(b) of the LGMPRA (DPLG, 2004a: 51) "a valuation roll remains valid for that financial year or for one or more subsequent financial years as the municipality may decide, but in total not for more than four financial years". In addition, "a municipality must regularly, but at least once a year, update its valuation roll by causing (a) a supplementary valuation roll to be prepared; or (b) the valuation roll to be amended" (DPLG, 2004a: 66), in order to capture any fluctuation in market value or account for any discrepancy in previous valuations.

3.2 Determination of the Land Tax Rate

The financial liabilities for municipal property rates are calculated by multiplying the market value of immovable property by a Cent amount in the Rand ("the rate randage") that a municipal council has determined. This amount is supposed to be decided by that council taking into account public comments/submissions/inputs on the council's draft rates policy and budget that is subjected to the process of community participation (DPLG, 2004b:2). The DPLG note that the critical determinant of how much property owners will pay is the amount in Rand each municipal council will determine for various property categories. In addition, the LGMPRA does not give the right to substantial increases in the total revenue needs of municipalities, nor does it set the Cent amount in the Rand.

Each municipality will continue to set and collect property rates in an amount sufficient to meet its needs, taking into account the likely impact of rates on local economic development, ratepayers and their ability to pay such rates (DPLG, 2004c: 3). In this regard, it must be noted that most countries that levy land tax apply a rate of less than 1% (see Table 1.2, page 16), whereas municipalities in South Africa tend to have higher rates - for example the Mtonjaneni and Umgeni municipalities have proposed rates of 1.5% and 1%, respectively (Barnesly, 2006; The Witness, 2007). In addition, farmers in more developed countries also receive higher levels of agricultural support from their governments than do most SA commercial farmers (apart from tariff protection afforded to several agricultural industries such as the SA sugar industry) (Darroch, 2003).

The LGMPRA does contain what are intended to be checks and balances to protect property owners if a given land tax rate levied by a municipality is shown to be materially and unreasonably prejudicing national economic policies, economic activities across municipal boundaries, and the national mobility of goods, services and capital. If the Minister for Provincial and Local Government is convinced by evidence to this effect, the Minister must, in terms of Section 16(2)(a) of the LGMPRA, and after notifying the Minister of Finance, gazette a notice to the relevant municipality that the Cent amount in the Rand must be limited to the amount specified in the notice (DPLG, 2004a:28). This implies for commercial farmers that they will have to convince the Minister of these material and unreasonably prejudicial effects if they dispute the land tax rates proposed by municipalities in which their farms are located.

3.3 Compulsory Phasing-in of Certain Rates

Under Section 21 of the LGMPRA, municipalities will have to "phase-in" land tax rates levied on newly rateable property over three financial years. Newly rateable property refers to any property on which property rates were not levied before the end of the financial year preceding the date on which the LGMPRA took effect. The phase-in period involves a discount of at least 75% of the land tax rate in Year 1 of the start of implementation of the LGMPRA by a particular municipality, a discount of at least 50% in Year 2, and a discount of at least 25% in Year 3. The full land tax rate then applies from Year 4 onwards (DPLG, 2004a:33-34).

3.4 Provision for Municipalities to Grant Property Rate Exemptions, Rebates and Reductions

In addition to the mandatory prohibitions on rating described in section 3.2, the LGMPRA enables municipalities to grant exemptions from, rebates on and reductions in property rates based on local conditions and circumstances. These provisions must be considered by the municipal council in relation to the benefit received by the local community from such relief measures. Owners of agricultural properties who are *bona fide* farmers qualify for such measures in terms of Section 15(2)(f) of the LGMPRA

(DPLG 2004a: 28). The LGMPRA does not specify the extent of these measures, but guidelines for the implementation of rebates for the owners of agricultural land are outlined in the GRPF provided by the DPLG. Municipalities may not levy rates "on a property belonging to a land reform beneficiary or his or her heirs, provided that this exclusion lapses ten years from the date on which such beneficiary's title was registered" (DPLG, 2004a: 30). The proposed format for these rebates is discussed in the next section.

3.5 Proposed DPLG Guidelines for Land Tax Rebates for Commercial Farms

The amount of land tax levied by municipalities on properties used for agricultural purposes in South Africa can be reduced depending on the extent of municipal services provided to farms, the contribution of agriculture to the local economy, and the extent to which agriculture assists the municipality in meeting its service delivery and development obligations. The guidelines for such rebates published in the GRPF (DPLG 2004c) are outlined in the next three sections.

3.5.1 Extent of Municipal Services Provided to Agricultural Properties

- 7.5% rebate, if there are no municipal roads next to the property.
- 7.5 % rebate, if there is no municipal sewerage to the property.
- 7.5% rebate, if there is no municipal electricity to the property.
- 20% rebate, if water is not supplied by the municipality.
- 7.5% rebate, if there is no refuse removal that is provided by the municipality (DPLG, 2004c: 11).

3.5.2 The Contribution of Agriculture to the Local Economy

It has been proposed that a rebate of up to 5% be granted to an agricultural property that contributes substantially to job creation, and if the salaries/wages of farm workers are

reasonable, e.g. if they meet the minimum standards set by the Government (minimum wage) or if they are in line with the industry average (DPLG, 2004c: 12).

3.5.3 Extent to which Agriculture Assists the Municipality in Meeting its Service Delivery and Development Obligations

- 5% rebate, if the owner is providing permanent residential property to the farm workers and such property is registered in the name of these farm workers; proof must be provided.
- 5% rebate, if such residential properties are provided with potable water.
- 5% rebate, if the farmer electrifies such residential properties of farm workers.
- 5% rebate, if the farmer is availing his land/buildings to be used for cemetery, education and recreational purposes of the farm workers' children and nearby community in general, etc. (DPLG, 2004c: 12).

Under the guidelines in sections 3.5.1 to 3.5.3 above, the maximum proposed rebate allowed if a farmer or land owner met all of the requirements stipulated, is 75%, where the onus is on commercial farmers to prove the above. The RIM for each of the case study farms accounts for these rebates, where applicable. Chapter 4 next describes the study research methodology used to identify study farms and data, and to develop the RIM framework.

CHAPTER 4: RESEARCH METHODOLOGY

This chapter outlines the research methodology used to assess the economic impact of different rates of land tax on the five case study KZN commercial farms. It describes these farms, study data collection and the RIM framework.

4.1 Target Commercial Farms in KZN

Due to cost and time constraints, and the confidential nature of the required data, the selected farms were drawn from farmers in the Mtonjaneni and Umgeni municipal districts of KZN that were prepared to provide the data required for the RIM. The Mtonjaneni municipal district office is based in Melmoth in Zululand, roughly 270 km north of Pietermaritzburg, the capital of KZN. The Umgeni municipal district office is based in the town of Howick, which is about 35 km north-west of Pietermaritzburg. The KZN province has a diverse commercial farming sector operating a wide range of enterprises such as poultry, livestock, sugarcane, timber, vegetable, maize, soya and dairy (Wikipedia, 2006c). Five commercial farmers were prepared to provide data to develop the case studies that differ in the main enterprises.

Case Study 1 is a sugar cane and timber farm spanning 816 hectares (ha) in the Mtonjaneni municipal district. Case Study 2 describes an intensive poultry (egg) farm with some maize (170 ha in total area), while Case Study 3 is an intensive dairy farm covering 434 ha. Case Study 4 applies to a farm where the land owner leases out 293 ha for intensive vegetable production, maize and grazing. Case Study 5 is a mixed enterprise farm producing maize, potato, sheep, cattle and poultry, spanning about 374 ha. Case study farms 2 to 5 are situated in the Umgeni municipal district. These five farms were chosen as their owners were (a) well-established (had been in operation for over 10 years); (b) able to provide relevant, accurate audited accounting data for the last five to six years; and (c) willing to release confidential accounting and economic data. Note that no “land reform” case study was chosen for this analysis as land reform beneficiaries

receive a ten-year exemption from the payment of property rates (DPLG, 2004a: 30). The case studies contain enterprises typical of the main farming enterprises in KZN.

4.2 Study Data Collection

Data were collected from farmers using face-to-face interviews and a questionnaire (see Appendix 1 on page 64) designed to obtain data to estimate the amount of land tax rebates in terms of the DPLG Guidelines discussed in Chapter 3. Most of the data were accounting data, drawn from the farm income and cash flow statements and balance sheet. These data were analyzed using the RIM described below in Section 4.3 to estimate the annual return to risk and land for each farm during 2001-2006 if available. The market value of land and fixed improvements (FI) for each property (including the homestead, but excluding the value of any standing crops) was estimated by independent professional valuers who requested to remain anonymous and not be cited in this dissertation. These valuations appear in each municipality's valuation roll and were conducted in accordance with the LGMPRA definition of market value ("the amount the property would have realized if sold on the date of valuation in the open market by a willing seller to a willing buyer" (DPLG, 2004a: 50) (see section 3.1 on page 31)) using the comparable sales method.

The research questionnaire (Appendix 1 on page 64) contained sections with questions about the extent of municipal services received by the farm; the farm's job creation and wage levels, and services provided to staff; the estimated market value of the land and FI; and the farmer/land owner's estimated opportunity cost of management (net revenue forgone from his/her next best occupation (Olsen, 2004)). The answers to these questions help to estimate the value of potential rebates under the DPLG proposals to compare against the annual return to risk and land (economic profit) for each case study in the empirical RIM that is described in the next section.

4.3 Empirical Analysis using the RIM Framework

Horngren and Sundem (1993) note that the RIM can be misleading if it assumes that book values are a sufficiently precise proxy for the "true" market values of assets. Hawawini *et al.* (2001) note further that accounting measures suffer from some well known conceptual disadvantages that arise from accounting conventions, mainly because accounting measures such as Return on Assets may not measure cash flows, and returns are not adjusted for risk. These shortcomings mean that accounting ratios do not provide information on past economic profitability or on a firm's future profitability. Meaningful conclusions need to be drawn from the expected *economic*, and not accounting, performance of firms. The principal feature that makes the RIM useful is that it reduces net income after accounting costs by a charge for the opportunity cost of management that is employed to produce the income (Hawawini *et al.*, 2001: 11). This yields an estimate of economic profit that is a proxy for the current annual operating return to risk and land that is realized from a farming activity.

The primary accounting and economic data drawn from each farm were adjusted to fit a RIM framework, as economic costs usually exceed accounting costs of production; this is because economic costs include both explicit accounting costs and implicit costs (Byrns, 2006: 1). An implicit cost is defined as "a cost that is represented by lost opportunity in the use of a company's own resources, excluding cash", while an explicit cost is defined as "a business expense that is easily identified and accounted for. Explicit costs represent clear, obvious cash outflows from a business that reduces its bottom-line profitability" (Investopedia, 2006a: 1). Economic profit is estimated for each case farm as a proxy for the current annual operating return to risk and land (rent) that will be reduced by the land tax. Economic profit is defined as "the difference between the revenue received from the sale of an output and the opportunity cost of the inputs used" (Investopedia, 2006b: 1). Economic profit occurs when a firm's revenue exceeds all costs, including explicit and implicit costs, whereas accounting profit only considers explicit costs.

Economists consider that "accounting measures of income are riddled with serious distortions that limit their use as performance measures" (Aggarwal, 2001: 56), because accounting measures often omit relevant economic data. Therefore, economic profit gives farmers and policy makers a better understanding of whether each case study farm can afford different levels of a proposed land tax - a farm with a "high" accounting profit may not necessarily have a "high" economic profit. The RIM framework used in this study is adapted from Emmanuel and Otley (1976), Mepham (1980), Kay and Edwards (1999), Begley and Feltham (2002), O'Hanlon and Peasnell (2002; 2004), Friedl (2005) and Darroch (2007). Appendices 2-6 on pages 67-71 show the RIMs for the five case studies.

The RIM for case studies 1, 2, 3 and 5 in appendices 2, 3 4 and 6, respectively, first estimates annual nominal accounting profit as farm revenue less fixed costs and variable costs, plus other receipts (if any), for each year during 2001-2006 if data are available. Under fixed costs, the annual depreciation charge is adjusted to current cost terms using the relevant Machinery and Implement index figure shown in Appendix 8 on page 73 provided by the SA Department of Agriculture (2006:101). This implies that the operational capacity of each case study farm is sustained by adequate provision of funds for the replacement of machinery and implements (Faul *et al*., 1981: 523). Annual nominal accounting profit (loss) is then expressed in real terms (2006 = 100) to make meaningful comparisons across 2001-2006 (McConnell and Brue, 2005: 144) using the SA Consumer Price Index (CPI) obtained from Statistics SA (2006) (see Appendix 7 on page 72). Annual real accounting profit is then adjusted to an after-tax basis using appropriate income tax rates reported by the SA Revenue Service (SARS) (SARS, 2006).

Opportunity cost is an economic cost that needs to be considered when making managerial decisions. The opportunity cost concept recognizes that inputs or resources have an alternative use, even if the alternative is non-use. In this study, the only salient opportunity cost that can be accounted for is that of management time. According to Olsen (2004: 209), the opportunity cost or *value of operator labor and management* is what the operator (farmer) could receive in a non-farm job that requires similar labor and management skills. If this opportunity cost component is ignored, annual farm profit will

be overstated and profit should then be interpreted as the "estimated return to management and profit" (Kay and Edwards, 1999: 168).

The opportunity cost of management used in each case study is estimated starting with the farmer/landowner's estimate of net after-tax income if placed in his/her next best line of work. Kay and Edwards (1999: 270) note that the existence of uncertainty adds complexity to many decisions; therefore, a farmer (landowner) probably forms expectations about the outcomes of different events. Therefore, each farmer/landowner in the study was asked to assign a *subjective probability* to his/her actually being able to secure a job in his/her next best line of work to allow for uncertainty in obtaining off-farm employment. The real opportunity cost of management in each case study, therefore, is estimated by net after-tax income in the next line of work multiplied by the estimated probability of securing that line of work. This (adjusted) real opportunity cost of management is subtracted from the real after-tax accounting profit for each year in order to estimate annual real economic profit (return to risk and land) for that year. The latter thus shows the current annual real operating returns to land (excluding capital gains due to land appreciation if any) available to pay the land tax after all resources *other than land* have received payment.

Note that the RIM for Case Study 4 in Appendix 5 on page 71 does not subtract a real opportunity cost of management as in case studies 1, 2, 3 and 5, because in this case the income earned by the lessor is *nominal annual rental income (economic profit) that would accrue to land after meeting the opportunity cost of management*. Maintenance expenses that are tax-deductible are first subtracted from nominal annual rental income to give nominal economic profit before income taxation. This figure is then expressed in real terms (2006 = 100) using the SA CPI (again see Appendix 7 on page 72) before deducting income tax based on SARS (2006) income tax rates to estimate the annual return to risk and land.

The annual return to risk and land expressed as a percentage of the market value of land and FI for the five case studies gives the *rate* of return to risk and land. Barnard and Nix

(1979: 530) state that "preferably average figures over several seasons should be obtained" for an effective comparison of farm financial results. The mean real economic profit and rate of return to risk and land for each case study over several seasons (2001-2006 is available) is thus estimated to compare farm performance. Sensitivity analysis was then applied to assess whether or not the annual and mean returns to risk and land can fund different levels of land tax ranging from 0.5% to 5% levied on the market value of land and FI for each farm. The sensitivity analysis also accounts for the effects of proposed land tax rebates under the GRPF guidelines outlined in Chapter 3 above. Case studies 2 to 5 also show the effects of a 50% rebate that has been proposed by the Umgeni municipality for agricultural properties (Lee, 2007). Case Study 1 (Cane and timber farm in the Mtonjaneni Municipal district) accounts for a land tax rebate according to the DPLG guidelines only, as the Mtonjaneni Municipality has not yet proposed any rebate (Lee, 2007). The analysis first assesses the farm's ability to pay the land tax amount at each level of land tax considering no rebate, and then accounting for the applicable rebate. The total land tax amount is calculated by multiplying the estimated market value of land and FI in each case study by the relevant land tax rate. Case Study 1 in the Mtonjaneni municipal district is subject to the phasing-in period, while the farms in the Umgeni municipality are no longer considered as "previously unrated land"; therefore, case studies 2 to 5 do not qualify for the three-year phasing-in period (Barnesly, 2006).

Chapter 5 presents the empirical results for each case study farm. The aim is to compare the estimated annual economic profit (current operating returns excluding capital gains) against the estimated annual land tax, with and without proposed land tax rebates. The research hypothesis is that the new land tax is likely to further reduce the annual return to risk and land on each farm, depending on the level of potential land tax rebates. This hypothesis implicitly assumes that funds earned by the municipality in each case from imposing the land tax have not yet been reinvested in infrastructure improvements that could potentially increase expected returns (rents) to farm land and hence raise farm land values. This is a plausible assumption given that the LGMPRA is only being implemented in these municipalities in 2007.

CHAPTER 5: EMPIRICAL RESULTS

This Chapter describes the land tax analysis for the five case studies presented in appendices 2 to 6. Mean values for key measures are estimated to summarize the effect of different rates of land tax on each farm's estimated annual economic profit.

5.1 Case Study 1

The case farm operates cane and timber enterprises and extends over 816ha, has a market value of about R7.5 million and qualifies for a 70% land tax rebate in terms of the GRPF rebate guidelines (the farm provides no permanent residential property to farm workers but rather offers suitable temporary accommodation). The full RIM analysis for Case Study 1 is presented in Appendix 2 on page 67, while Table 5.1 summarizes the key accounting and economic data. Table 5.2 shows the amount of tax payable with and without a 70% rebate based on the market value of land for 2006 of about R7.5 million. Table 5.3 shows the effect of the phasing-in period outlined in the LGMPRA assuming a land tax of 1.5% proposed by the Mtonjaneni Municipality. After four years with no rebate the annual land tax is R112 500, while a 70% rebate reduces the tax to R33 750. Table 5.4 represents the official estimated market value of this farm as shown in the municipal valuation roll.

Table 5.1: Key Data for Case Study 1: Sugarcane and Timber Farm, Mtonjaneni Municipality, KZN (2006=100).

Measure	2006	2005	2004	2003	2002	Mean
Nominal Accounting Profit (R)	1 218 115	170 790	496 989	1 169 107	1 025 108	816 022
Real Accounting Profit before income tax (R)	1 218 115	178 838	537 867	1 283 323	1190 602	881 748
Real Accounting Profit after income tax (R)	773 869	134 924	352 744	792 201	708 279	552 403
Real Opportunity Cost of Management (90% Probability) (R)	405 000	405 000	405 000	405 000	405 000	405 000
Real Economic Profit (Loss) (R)	368 869	-270 076	-52 256	387 201	303 279	147 403
Return to Risk and Land (%) *	4.92%	-3.60%	-0.70%	5.16%	4.04%	1.96%

*Note: Return to Risk and Land (%) = Real Economic Profit (Loss)/Real Value of Land and Fixed Improvements (R7 500 000).

Table 5.2: Land Tax Payable With and Without a Rebate: Sugarcane and Timber Farm, Mtonjaneni Municipality, KZN (2006=100).

Land Tax Rate (%)	0.5%	1%	1.5%	2%	3%	4%	5%
Amount Payable (No rebate)	37 500	75 000	112 500	150 000	225 000	300 000	375 000
Amount Payable (70% Rebate)	11 250	22 500	33 750	45 000	67 500	90 000	112 500

Table 5.3: Annual Land Tax During the Four-Year Phasing-in Period for a 1.5% Land Tax Rate: Sugarcane and Timber Farm, Mtonjaneni Municipality, KZN (2006 = 100).

Period	No Rebate	70% Rebate
Year 1: 75% Reduction (R)	28 125	8 436
Year 2: 50% Reduction (R)	56 250	16 875
Year 3: 25% Reduction (R)	84 375	25 213
Year 4: Full Rate Applies (R)	112 500	33 750

Table 5.4: Market Value of Land and FI: Sugarcane and Timber Farm, Mtonjaneni Municipality, KZN (2006)

Area	Market Value (R)
816 ha	7 500 000
Total Market Value	7 500 000

The mean return to risk and land for Case Study 1 indicates that a land tax rate of 1.96% would on average, tax away all economic profit. The estimated return to risk and land can finance all land tax rate scenarios up to 4% and a 5% rate with GRPF rebate, from current operating returns in three out of five years. A land tax rate of 5% with no rebate can be financed only in 2003 when it will almost completely deplete real economic profit.

5.2 Case Study 2

The RIM analysis for Case Study 2 presented in Appendix 3 on page 68 relates to an intensive poultry (egg production) operation within the Umgeni municipal district. The farm covers 170ha with a market value of about R8.2 million. Table 5.5 summarizes key data from the RIM analysis, while Table 5.6 shows the land tax payable at rates ranging from 0.5% to 5%, including the 1% rate currently applied by the Umgeni Municipality

(The Witness, 2007). Like Case Study 1, this farm qualifies for a 70% rebate under the GRPF guidelines (farm workers do not have permanent housing). Table 5.7 represents the market value of the farm, and highlights the importance of the value of fixed improvements in the overall market valuation of this farm.

Table 5.5: Key Data for Case Study 2: Intensive Poultry (Egg) Farm, Umgeni Municipality, KZN (2006=100).

Measure	2006	2005	2004	2003	2002	Mean
Nominal Accounting Profit (R)	1 995 217	780 664	1 496 271	708 478	518 905	1 099 907
Real Accounting Profit before income tax (R)	1 995 217	817 449	1 619 341	777 693	602 677	1 162 475
Real Accounting Profit after income tax (R)	1 240 130	524 451	1 001 547	488 823	314 735	713 937
Real Opportunity Cost of Management (95% Probability) (R)	1 140 000	1 140 000	1 140 000	1 140 000	1 140 000	1 140 000
Real Economic Profit (Loss) (R)	100 130	-615 549	-138 453	-651 177	-825 265	-426 063
Return to Risk and Land (%) *	1.22%	-7.48%	-1.68%	-7.91%	-10.03%	-5.18%

*Note: Return to Risk and Land (%) = Real Economic Profit (Loss)/Real Value of Land and Fixed Improvements (R8 232 000).

Table 5.6: Land Tax Payable With and Without a Rebate: Intensive Poultry (Egg) Farm, Umgeni Municipality, KZN (2006=100).

Land Tax Rate	**0.5%**	**1%**	**2%**	**3%**	**4%**	**5%**
Amount Payable (No Rebate)	41 160	82 320	164 640	246 960	329 280	411 600
Amount Payable (70% Rebate)	12 348	24 696	49 392	74 088	131 712	123 480
Amount Payable (50% Rebate)	20 580	41 160	82 320	123 480	164 640	205 800

Table 5.7: Market Value of Land and FI: Intensive Poultry (Egg) Farm, Umgeni Municipality, KZN (2006)

Area	**Market Value (R)**
20ha	4 981 000
20ha	1 251 000
130ha	2 000 000
Total Market Value	8 232 000

A land tax rate of 1% with or without rebates could be funded from current operating returns only in one of the five years (2006). A land tax rate of 2% could also be financed with rebates only in 2006, but reduces the surplus available for new investment after

paying the land tax to below 1% of market value. A land tax rate of 3% with a 70% rebate produces a result similar to a land tax of 2% with rebates.

5.3 Case Study 3

Appendix 4 on page 69 shows the RIM analysis for Case Study 3. Table 5.8 and Table 5.9 show the key accounting, economic and land tax data for this intensive dairy farm in the Umgeni municipal district (market value of about R8.2 million) that has a 70% land tax rebate using the GRPF criteria (again farm workers receive no permanent housing). Table 5.10 shows how the market value of land and fixed improvements was estimated.

Table 5.8: Key Data for Case Study 3: Intensive Dairy Farm, Umgeni Municipality, KZN (2006=100).

Measure	2005	2004	2003	2002	2001	Mean
Nominal Accounting Profit (R)	460 732	774 047	1 660 214	417 591	11 278	664 772
Real Accounting Profit before income tax (R)	482 442	837 713	1 822 408	485 007	14 294	728 373
Real Accounting Profit after income tax (R)	323 465	532 558	1 115 645	299 004	11 721	456 479
Real Opportunity Cost of Management (90% Probability) (R)	450 000	450 000	450 000	450 000	450 000	450 000
Real Economic Profit (Loss) (R)	-126 535	82 558	665 645	-150 996	-438 279	6 479
Return to Risk and Land (%) *	-1.55%	1.01%	8.14%	-1.85%	-5.36%	0.08%

*Note: Return to Risk and Land (%) = Real Economic Profit (Loss)/Real Value of Land and Fixed Improvements (R8 178 000).

Table 5.9: Land Tax Payable With and Without a Rebate: Intensive Dairy Farm, Umgeni Municipality, KZN (2006=100).

Land Tax Rate	**0.5%**	**1%**	**2%**	**3%**	**4%**	**5%**
Amount Payable (No Rebate) (R)	40 890	81 780	163 560	245 340	327 120	408 900
Amount Payable (70% Rebate) (R)	12 267	24 534	49 068	73 602	98 136	122 670
Amount Payable (50% Rebate) (R)	20 445	40 890	81 780	122 670	163 560	204 450

Table 5.10: Market Value of Land and FI: Intensive Dairy Farm, Umgeni Municipality, KZN (2006)

Area	**Market Value (R)**
21ha	650 000
89ha	3 872 000
324.3ha	3 656 000
Total Market Value	8 178 000

This dairy farm would only be able to pay a land tax rate of 1% out of current operating returns in two out of the five years analyzed (2003 and 2004) with or without the DPLG or Umgeni Municipality proposed rebates. Payment of a 1% land tax without rebates, or a 2% land tax with the proposed 50% municipal rebate, in 2004 would have left a surplus for annual reinvestment of less than R1 000. The mean economic profit and return to risk and land for 2001-2005 were both positive, being R6 479 and 0.08%, respectively. This suggests that a land tax rate of 1% of the market value of land and fixed improvements would markedly reduce the incentive to invest in future capital improvements in this case.

5.4 Case Study 4

Case Study 4 analyses the impact of a land tax on the rental income earned by the lessor from 239ha of leased land. Appendix 5 on page 70 presents the RIM analysis, while key measures relating to the rental income earned by the lessor from leasing out 239ha of land worth about R2 million for vegetable and maize production and grazing are shown in Table 5.11 on page 47. This farm would qualify for a 65% land tax rebate under the GRPF criteria as shown in Table 5.12 on page 47 that estimates the relevant land tax amounts. Table 5.13 on page 47 analyses the market value of the 239ha that is leased out.

The RIM analysis for this case, as outlined on page 40 above, differs from the other four cases in estimating annual real economic profit, as the lessor receives cash rent (nominal economic profit) rather than accounting profit as annual income. The implicit assumption in this case is that *the opportunity cost of management has been met*, leaving nominal economic profit as the return to risk and land before income tax. Maintenance costs are deducted before income tax to reflect the lessor's tax-deductible expenditure in maintaining the leased land. Real economic profit after income tax then shows the estimated annual return to risk and land.

Given the land taxes estimated in Table 5.12, economic profit could fund a 1% land tax rate with and without rebates in all five years during 2002-2006. However, the limited surplus available for reinvestment at land tax rates of 2% and greater, even with the 50%

Table 5.11: Key Data for Case Study 4: Leased Land, Umgeni Municipality, KZN (2006=100).

Measure	2006	2005	2004	2003	2002	Mean
Nominal Cash Rent (Economic Profit) before income tax (R)	84 000	84 000	84 000	79 000	79 000	82 000
Annual nominal maintenance cost (R)	17 000	15 350	16 000	14 350	12 750	15 090
Real Economic Profit before income tax (R)	67 000	71 885	73 593	70 966	76 945	72 078
Real Economic Profit after income tax (R)	54 940	58 946	60 066	57 932	57 172	57 811
Return to Risk and Land (%) *	2.80%	3.00%	3.06%	2.95%	2.91%	2.94%

*Note: Return to Risk and Land (%) = Real Economic Profit after income tax/Real Value of Land and Fixed Improvements (R1 964 487).

Table 5.12: Land Tax Payable With and Without a Rebate: Leased Land, Umgeni Municipality, KZN (2006=100).

Land Tax Rate	**0.5%**	**1%**	**2%**	**3%**	**4%**	**5%**
Amount Payable (No Rebate) (R)	9 822	19 645	39 290	58 935	78 579	98 224
Amount Payable (65% Rebate) (R)	3 438	6 876	13 751	20 627	27 503	34 379
Amount Payable (50% Rebate) (R)	4 911	9 822	19 645	29 467	39 290	49 112

Table 5.13: Market Value of Land and FI: Leased Land, Umgeni Municipality, KZN (2006)

Area	**Market Value(R)**
239 ha	1 964 487
Total Market Value	1 964 487

rebate proposed by the Umgeni Municipality, would markedly reduce the incentive to make further capital improvements on this farm land. The leased land also shows a positive mean economic profit after income tax (R57 811) and positive mean return to risk and land (2.94%).

5.5 Case Study 5

Case Study 5 is based on the returns to a mixed enterprise farm producing poultry, beef, potatoes, maize and sheep. The farm covers 374 ha and has an estimated market value of close to R3.6 million. The RIM analysis for this case is presented in Appendix 6 on page 71. The farm qualifies for a 70% land tax rebate using the GRPF guidelines. As with case studies 1, 2 and 3, there is no staff ownership of property, but compound residences are

provided to farm workers. Table 5.14 and Table 5.15 below summarize the relevant accounting, economic and land tax data, while Table 5.16 shows the total market value of this farm.

Table 5.14: Key Data for Case Study 5: Mixed Enterprise Farm, Umgeni Municipality, KZN, (2006=100).

Measure	2006	2005	2004	2003	2002	Mean
Nominal Accounting Profit (R)	371 917	-169 792	-196 786	226 080	-149 675	16 349
Real Accounting Profit (Loss) before income tax (R)	371 917	-177 792	-212 972	248 167	-173 838	11 096
Real Accounting Profit (Loss) after income tax (R)	265 589	-177 792	-212 972	171 100	-173 838	-25 583
Real Opportunity Cost of Management (70% Probability) (R)	280 000	280 000	280 000	280 000	280 000	280 000
Real Economic Profit (Loss) (R)	-14 411	-457 792	-492 972	-108 900	-453 838	-305 583
Return to Risk and Land (%) *	-0.40%	-12.73%	-13.71%	-3.03%	-12.62%	-8.50%

*Note: Return to Risk and Land (%) = Real Economic Profit(Loss)/Real Value of Land and Fixed Improvements (R3 597 000).

Table 5.15: Land Tax Payable With and Without a Rebate: Mixed Enterprise Farm, Umgeni Municipality, KZN (2006=100).

Land Tax Rate	**0.5%**	**1%**	**2%**	**3%**	**4%**	**5%**
Amount Payable (No Rebate) (R)	17 985	35 970	71 940	107 910	143 880	179 850
Amount Payable (70% Rebate) (R)	5 396	10 791	21 582	32 373	43 164	53 955
Amount Payable (50% Rebate) (R)	8 993	17 985	35 970	53 955	71 940	89 925

Table 5.16: Market Value of Land and FI: Mixed Enterprise Farm, Umgeni Municipality, KZN (2006)

Area	**Market Value (R)**
374 ha	3 597 000
Total Market Value	3 597 000

Case Study 5 cannot sustain payment of any level of land tax out of annual current operating returns during 2002-2006. The negative mean annual rate of return to risk and land (-8.50%) implies that a land tax would further worsen this farm's liquidity position.

5.6 Summary of Empirical Results

The estimated mean annual rate of return to risk and land (i.e. the real economic profit (loss) excluding capital gains, divided by the real value of land and fixed improvements) for the five case study farms during 2001-2006 ranged from -8.50% to 2.94%, with an average of -1.74%. The case farms' ability to pay a land tax rate of 1% on the value of improved land with and without proposed GRPF rebates from annual current operating returns ranged from zero to five out of five years, with an average of two out of five years. A land tax rate of 2% *with such rebates* could be financed using current operating returns also only in two out of five years on average. These results suggest that land taxes on the market value of land and fixed improvements at the rates of 1.5% or 1% proposed by the municipalities concerned on these specific farms would markedly reduce the incentive to make future capital investments on these farms.

DISCUSSION AND CONCLUSIONS

The brief history of land taxation around the world, including in South Africa, presented in this dissertation shows that South Africa's main trading partners tax farm land at a rate below 1%. The LGMPRA makes provision for rebates on, reductions in and exemptions from a land tax for commercial farmers in South Africa. Proposed guidelines and criteria for such rebates have been published by the DPLG in South Africa, and were accounted for in the five case studies analyzed in this dissertation. Four of these five case study farms would qualify for a 70% land tax rebate, and one for a 65% land tax rebate, based on these guidelines. Importantly, these rebates are *only guidelines* and SA municipalities do not necessarily have to implement them.

A key feature of the Residual Income Methodology (RIM) developed in this dissertation is that it accounts for the opportunity cost of management time and then estimates a current operating return to risk and land (economic profit), excluding any capital gains due to appreciation (if any) of land value. Study results show that a land tax could only be paid out of economic profit with or without proposed DPLG rebates in three out of the five years for Case Study 1 in the Mtonjaneni Municipality that wants to rate the improved value of farm land at 1.5%. For case studies 2 to 5 in the Umgeni Municipality, which proposes to rate the improved value of farm land at 1%, only one of these farms could, on average, pay this level of land tax with or without proposed DPLG rebates out of current operating returns during 2001-2006. This raises concerns about the potential negative impact of such land taxes on future investments in farm improvements. Given that land tax rates in South Africa's major trading partners tend to be less than 1%, and that most of those countries provide considerable financial support to agriculture, land taxes in South Africa will likely further reduce the relative competitiveness of the SA agricultural sector.

Case Study 1 (Sugarcane and Timber Farm) had a positive estimated real mean annual economic profit (R147 403) and mean return to risk and land (1.96%) for the period 2002-2006. This farm would only have been able to pay the proposed land tax in three of

the five years studied. Under the DPLG guidelines for land tax rebates, it would qualify for a 70% rebate (if the Mtonjaneni Municipality implemented a land tax of 1.5%, the farm would pay an effective land tax rate of 0.45%). Case Study 2 (Intensive Poultry Farm) realized a negative estimated mean economic profit (-R426 063) for the period 2002-2006 and, therefore, a negative estimated mean return to risk and land (-5.18%). Although the DPLG rebate guidelines suggest that this farm could qualify for a 70% land tax rebate, the rebate of 50% currently proposed by the Umgeni Municipality would raise the effective rate to 0.50%. Even at these lower land tax rates, Case Study 2 could only pay the land tax in one of the five years (2006) studied. In addition, the estimated return to risk and land after meeting the land tax would have been negligible in that year.

Case Study 3 (Intensive Dairy Farm) is also in the Umgeni Municipality and qualifies for a 70% land tax rebate under the DPLG Guidelines. This farm realized a small positive estimated mean annual economic profit (R6 479) for the period 2001-2005. It recorded a positive estimated return to risk and land for two of the five years, and a positive mean return of 0.08%. The implication is that even with a 70% or 50% land tax rebate, Case Study 3 cannot finance a land tax rate of 1% from current annual operating returns. Case Study 4 on leased land showed a positive estimated mean annual return to risk and land of 2.94% for the period 2002-2006, and could fund a 1% land tax rate with and without the proposed DPLG rebates in all five years. The possibility of a 65% or 50% land tax rebate would ease the burden of a 1% land tax rate in this case. Case Study 5 (Mixed Enterprise Farm) in the Umgeni Municipality, like Case Study 2, reported a negative estimated mean annual economic profit (–R305 583) and negative estimated mean return to risk and land (-8.50%) for the period 2002-2006. This farm could not afford to pay any land tax in any of the years studied over the period even allowing for proposed 70% or 50% land tax rebates.

The farms used in the five case studies in this dissertation have all been in operation for over ten years and are relatively well-established farming enterprises. This raises the important question of what effect any level of land tax will have on smaller farm enterprises than the commercial farms in these case studies. A land tax on the improved

value of land is likely to reduce the expected returns to farmland (net rents). Lower returns to farmland will likely result in reduced land values and, therefore, less collateral for farmers to use as security for both existing and future borrowings. If these farmers cannot afford to pay a land tax in the average to low-income years, borrowings would be expected to increase, placing them further in debt.

Study results relate to five case study farms that, while operating typical farm enterprises found in KZN, are not a statistically representative sample of commercial farms in KZN. Further research is, therefore, needed in KZN and other SA provinces to estimate how different rates of land tax on the improved value of farm land will affect the economic performance of farms in other areas to assess whether rates of over 1% can be financed out of current operating returns without markedly reducing capital investment in improvements. Another policy issue raised by this study is the extent to which SA municipalities will adopt the DPLG GRPF guidelines on land tax rebates. These guidelines are not binding on municipalities, and at the time of writing, the Mtonjaneni Municipality had offered no rebate, while the Umgeni Municipality had proposed a flat rate of 50% on all farm properties (despite this study showing that the four farms in the Umgeni Municipality would qualify for rebates of between 65% and 70% under the GRPF criteria).

This study also highlights the need to assess the impact of land taxes on SA commercial farms on a case-by-case, municipality-by-municipality basis, using data that are specific to individual farms. Key determinants will be the estimated market value of improved farm land, the rate randage, the extent of land tax rebates allowed, the phasing-in period and the estimated annual current operating returns to farm land (excluding capital gains if any) over several years. More research is also needed to assess whether the costs that municipalities will incur to implement land taxes (the value of land tax rebates plus land valuation and administration costs) will be less than the revenue derived from these taxes.

SUMMARY

This study first briefly reviews the history of land taxation throughout the world, dealing with regions such as the United States of America (USA), Britain, Australia, relevant Nordic countries and South Africa. This brief history provides a background on how and why land taxation was and is used in different countries. To put the concept of a land tax into context, it is necessary to describe and discuss the origins and history of land and property taxation worldwide. Land and property taxes in various forms are said to be as old as human civilization itself, with an unbroken recorded history of at least 5 000 years. History shows that rates of land taxes on farm land in most countries throughout the world tend to be less than 1%. Land taxation has different goals in different countries, and in South Africa the implementation of a land tax on farm land is intended to provide local municipalities with revenue to help them meet their service development obligations.

The implementation of a land tax is a disincentive to future capital investment on commercial farms. However, the capitalization of a land tax is partly offset if municipalities provide services (e.g. roads) from land tax revenue. Other disadvantages of a land tax are: (a) administration is costly as all properties need to be appraised individually and regularly; (b) in practice it is almost impossible to exclude all improvements from the tax; (c) the tax is a flat rate tax and not progressive; and (d) the tax is the same in good (relatively higher income) years and bad (relatively lower income) years during a given valuation cycle, although it may be possible to defer the tax and incur interest charges. Point (d) highlights that the land tax is a fixed cost as it cannot be shifted and has to be paid by the farmer regardless of performance or what is produced on the farm. Advantages of a land tax include: (a) evasion and avoidance are not possible; (b) farmers need not keep records on costs and incomes as required for Value Added Tax (VAT) and income tax reporting; (c) it is a wealth tax; and (d) it may more effectively tax the wealthy landowner who with the assistance of tax experts can implement strategies to avoid income taxes.

This study highlights key features of the LGMPRA No. 6 of 2004 and the guidelines proposed by the DPLG for land tax rebates that are applicable to commercial farmers in South Africa. Relevant factors impacting on commercial farms in the LGMPRA No. 6 of 2004 include the designation of municipal valuers and criteria for valuing farm land (market value of improved land); the provision for municipalities to grant commercial farmers exemptions from, rebates on and reductions in land taxes taking into account the contribution of agriculture to the local economy; the extent to which agriculture assists the municipality in meeting its obligations, and municipal services that are provided to farms; the phasing in of the LGMPRA and the determination of the rate of land tax.

The study develops a Residual Income Methodology (RIM) framework to estimate the annual and mean economic profit (return to risk and land) realized by each case study farm over the period 2001-2006. This RIM framework uses audited financial results from each farm, making specific use of income statements and balance sheets. The estimated return to risk and land shows whether or not each case study farm can pay a land tax at proposed rates out of current operating returns that exclude capital gains (if any) on land. The market value of improved land (attained from professional valuers) for each farm is subjected to a sensitivity analysis using different land tax rates, varying from 0.5% to 5%. The estimated amount of land tax at each land tax rate is then compared to the estimated return to risk and land for each year to predict what levels of land tax rate (if any) can be met from current operating returns.

The case studies cover the main farming enterprises found in KZN, as they include a cane and timber farm, an intensive poultry farm, a dairy, a mixed enterprise farm and leased land under intensive vegetable production. Case Study 1 is in the Mtonjaneni municipal district, while case studies 2, 3, 4, and 5 are found in the Umgeni municipal district. Five years worth of audited accounting data were analyzed for each case study. Following the DPLG proposed guidelines and each municipality's proposed land tax policy, a land tax rebate is estimated for each case study to see what affect it would have on reducing the land tax charge.

The mean annual return to risk and land for the five case studies during 2001-2006 was -1.74%. Case Study 1 (Sugarcane and Timber Farm) realized a mean return to risk and land of 1.96%; Case Study 2 (Intensive Poultry (Egg) Farm) a mean return to risk and land of -5.18%; Case Study 3 (Intensive Dairy Farm) a mean return to risk and land of 0.08%; Case Study 4 (Leased Land) a mean return to risk and land of 2.94%; and Case Study 5 (mixed enterprise operation) a mean return to risk and land of -8.50%.

Study results show that a land tax could only be paid out of economic profit with or without proposed DPLG rebates in three out of the five years for Case Study 1 in the Mtonjaneni Municipality that wants to rate the improved value of farm land at 1.5%. For case studies 2 to 5 in the Umgeni Municipality, which proposes to rate the improved value of farm land at 1%, only one of these farms could, *on average*, pay this level of land tax with or without proposed DPLG rebates out of current operating returns during 2001-2006. This raises concerns about the potential negative impact of such land taxes on future investments in farm improvements. Given that land tax rates in South Africa's major trading partners tend to be less than 1%, and that most of those countries provide considerable financial support to agriculture, land taxes in South Africa will likely further reduce the relative competitiveness of the SA agricultural sector.

Study results relate to five case study farms that, while operating typical farm enterprises found in KZN, are not a statistically representative sample of commercial farms in KZN. Further research is, therefore, needed in KZN and other SA provinces to estimate how different rates of land tax on the improved value of farm land will affect the economic performance of farms in other areas to assess whether rates of over 1% can be financed out of current operating returns without markedly reducing capital investment in improvements. Two further policy issues raised by this study are the extent to which SA municipalities will adopt the DPLG GRPF guidelines on land tax rebates, and whether the costs of implementing the proposed land taxes on farm land will be less than the expected revenue derived from the land taxes.

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APPENDIX 1: Research Questionnaire

Questions to Farmers or Land Owners.

1. What municipality jurisdiction does your farm land fall under?

_____

_____

_____

2. Has your farm been rated under the newly implemented Local Government Municipal Property Rates Act No. 6 of 2004? ☐ Yes ☐ No

3. If your answer to Question 2 was Yes, what was the market value (value of land and fixed improvements) applied to your farmland? If your answer was No, what is the estimated current market value of your farm land (including fixed improvements)?

R _____.

4. Do you farm your own land or is your farm land wholly or partly leased out?

_____

_____

_____

5. What are the most important enterprises on your farm?

_____

_____

_____

6. Are you aware of the land tax rebate system proposed by the DPLG in the Generic Rates Policy Format concerning land tax rebates for agricultural land?

☐ Yes ☐ No

7. Could you please answer Yes or No below for the relevant rebates that your farm could qualify.

7.1 Is your farm land serviced by a municipal road?

☐ Yes ☐ No

7.2 Is there municipal sewerage removal on your farm land?

☐ Yes ☐ No

7.3 Does the municipality provide your farm with electricity?

☐ Yes ☐ No

7.4 Does the municipality provide your farm with water?

☐ Yes ☐ No

7.5 Does the municipality provide your farm with refuse removal services?

☐ Yes ☐ No

7.6 Does your farm contribute substantially to job creation?

☐ Yes ☐ No

Why?_____

_____

_____

_____

7.7 Do you think your farm business pays reasonable farm wages i.e. in accordance with minimum wage legislation for agriculture or in line with the industry average?

☐ Yes ☐ No

7.8 Do you provide your farm workers with permanent residential property?

☐ Yes ☐ No

7.9 Do you supply your farm worker residences with potable water?

☐ Yes ☐ No

7.10 Do you supply your farm worker residences with electricity?

☐ Yes ☐ No

7.11 Do you provide any buildings or land that is used by your farm workers or relatives thereof as a cemetery, for educational, or for recreational purposes?

☐ Yes ☐ No

If so, what?

_____

_____

_____

8. What do you estimate your annual salary net of income tax would be in your next best line of work?

R_____.

9. What subjective probability would you attach to actually being able to secure the job in your next best line of work? _____%

APPENDIX 2: Sugarcane and Timber Farm in the Mtonjaneni Municipal District, KwaZulu-Natal

Table A.2.1: RIM Analysis using Real Economic Profit of a Sugarcane and Timber Farm situated in the Mtonjaneni Municipal District, KwaZulu-Natal (2006=100)

		2006 R	2005 R	2004 R	2003 R	2002 R	Real Mean
Revenue		9 991 606	8 352 398	9 861 739	8 246 881	6 641 931	
	Cane sales	5 949 039	4 914 983	6 200 187	6 060 052	4 734 215	
	Marginal milling profits	622 766	598 126	1 058 057	1 043 373	832 152	
	Timber sales	3 314 111	2 716 854	2 575 039	1 143 456	1 075 564	
	Contracting income	1 513	122 435	28 456	0	0	
	Seed income	104 177	0	0	0	0	
Add: Other Revenue		997 370	646 882	999 525	980 000	54 595	
	Rental	965 398	577 499	981 300	980 000	53 375	
	Insurance received	31 972	69 383	18 225	0	1 220	
Less: Variable Costs		10 071 573	9 160 863	10 254 388	7 956 115	5 567 240	
	Business running costs	1 365 425	1 013 598	1 564 965	1 834 235	907 564	
	Other variable costs	1 305 368	1 497 301	1 292 195	463 834	1 000 105	
	Contracting charges	2 490 955	2 376 581	1 982 391	2 300 463	1 624 430	
	Fertilizer	575 072	335 039	482 821	1 086 400	450 170	
	Rent paid	950 000	900 000	672 000	0	0	
	Seed	31 480	51 289	107 377	23 012	0	
	Transport & loading	1 729 301	1 624 722	2 259 594	1 639 658	1 166 389	
	Chemicals	652 155	426 826	646 704	225 048	237 105	
	Repairs & maintenance	971 817	935 507	1 246 341	383 465	181 477	
Less: Fixed Costs							
	Depreciation - plant & equipment	283 039	274 689	196 063	124 458	119 311	
Add: Other Receipts							
	Interest received	583 751	607 062	86 176	22 799	15 133	
Accounting Profit	Nominal Accounting Profit	1 218 115	170 790	496 989	1 169 107	1 025 108	**816 022**
	Real Accounting Profit before income tax	1 218 115	178 838	537 867	1 283 323	1 190 602	**881 748**
	Real Accounting Profit after income tax	773 869	134 924	352 744	792 201	708 279	**552 403**
Less: Opportunity Costs							
	Real opportunity cost of management (90% Probability)[a]	405 000	405 000	405 000	405 000	405 000	**405 000**
Return to Risk and Land (Economic Profit)		368 869	-270 076	-52 256	387 201	303 279	**147 403**

Note: [a]Real opportunity cost of management = Estimated annual real after-tax income in next best line of work x the subjective probability (90%) of securing that job.

APPENDIX 3: Intensive Poultry (Egg) Farm, Umgeni Municipal District, KwaZulu-Natal

Table A.3.1: RIM Analysis using Real Economic Profit of a Poultry Farm situated in the Umgeni Municipal District, KwaZulu Natal (2006=100)

		2006 R	2005 R	2004 R	2003 R	2002 R	Real Mean
Revenue		12 241 189	11 230 047	10 631 726	9 122 672	6 215 102	
	Poultry	11 031 598	10 064 246	9 892 708	8 640 411	5 911 612	
	Livestock	872 022	1 020 312	704 199	476 901	303 441	
	Maize trading	265 592	79 364	0	0	0	
	Bad debts recovered	11 454	4 192	0	0	0	
	Packaging	51 460	40 672	26 123	0	0	
	Scrap sales	1 974	4 921	8 696	3 650	0	
	Timber	0	5 263	0	0	0	
	Profit on disposal of assets	7 089	11 077	0	1 710	49	
Add: Other Revenue		41 061	1 225	0	2 274	0	
	Insurance claims	24 561	0	0	0	0	
	Rebates	0	1 225	0	2 274	0	
	Rental	16 500	0	0	0	0	
Less: Variable Costs		10 170 315	10 327 720	9 070 176	8 350 009	5 623 638	
	Business running costs	1 027 472	830 607	792 793	622 519	435 496	
	Other variable costs	1 540 624	1 711 973	1 067 015	647 249	287 203	
	Purchases - pullets	2 006 820	1 738 800	1 752 549	1 371 140	1 249 182	
	Chicken feed	4 004 175	4 456 614	4 049 667	4 739 003	3 033 341	
	Packaging	1 010 318	913 487	983 877	674 645	437 120	
	Wages	555 466	468 332	424 275	295 453	181 296	
	Fertilizer	25 440	207 907	0	0	0	
Less: Fixed Costs							
	Depreciation - cages, plant & equipment	129 825	141 531	79 862	73 959	79 872	
Add: Other Receipts							
	Interest received	13 107	18 643	14 583	7 500	7 313	
Accounting Profit	Nominal Accounting Profit	1 995 217	780 664	1 496 271	708 478	518 905	**1 099 907**
	Real Accounting Profit before income tax	1 995 217	817 449	1 619 341	777 693	602 677	**1 162 475**
	Real Accounting Profit after income tax	1 240 130	524 451	1 001 547	488 823	314 735	**713 937**
Less: Opportunity Costs							
	Real opportunity cost of management (95% Probability)[a]	1 140 000	1 140 000	1 140 000	1 140 000	1 140 000	**1 140 000**
Return to Risk and Land (Economic Profit)		100 130	-615 549	-138 453	-651 177	-825 265	**-426 063**

Note: [a]Real opportunity cost of management = Estimated annual real after-tax income in next best line of work x the subjective probability (95%) of securing that job.

APPENDIX 4: Intensive Dairy Farm, Umgeni Municipal District, KwaZulu-Natal

Table A.4.1: RIM Analysis using Real Economic Profit of an Intensive Dairy Farm situated in the Umgeni Municipal District, KwaZulu Natal (2006=100)

		2005 R	2004 R	2003 R	2002 R	2001 R	Real Mean
Revenue		4 426 069	4 398 065	4 488 741	3 979 023	2 810 573	
	Sales			4 473 345	3 953 532	2 810 573	
	Milk sales	3 952 011	3 952 413				
	Soya sales	0	254 232	0	0	0	
	Maize sales	0	68 697	0	0	0	
	Cull cow sales	183 298	115 258	0	0	0	
	Profit on disposal of assets	290 760	7 465	15 396	25 491	0	
Add: Other Revenue		382 405	17 753	71 169	8 289	9 003	
	Discount received	1 447	1 544	1 627	1 120	476	
	Sundry income	380 958	16 209	69 542	7 169	8 527	
Less: Variable Costs		4 060 068	3 864 383	2 785 552	3 431 635	2 694 892	
	Cost of Sales			1 787 636	2 535 090	1 838 756	
	Business running costs	1 405 170	1 456 742	885 943	798 489	847 912	
	Other variable costs	69 471	84 851	111 973	98 056	8 224	
	Contracting fees	212 222	228 759	0	0	0	
	Feed	1 212 288	1 049 396	0	0	0	
	Fertilizer	377 636	401 471	0	0	0	
	Fuel	149 905	161 058	0	0	0	
	Repairs & maintenance	248 339	132 477	0	0	0	
	Seed	128 656	142 180	0	0	0	
	Stock medicine	256 381	207 449	0	0	0	
Less: Fixed Costs							
	Depreciation - plant & equipment	159 295	105 215	114 239	138 372	113 485	
Add: Other Receipts							
	Interest received	0	122	95	286	79	
Change In Value of Stock on Hand		-128 379	327 705	0	0	0	
Accounting Profit							
	Nominal Accounting Profit	460 732	774 047	1 660 214	417 591	11 278	**664 772**
	Real Accounting Profit before income tax	482 442	837 713	1 822 408	485 007	14 294	**728 373**
	Real Accounting Profit after income tax	323 465	532 558	1 115 645	299 004	11 721	**456 479**
Less: Opportunity Costs							
	Real opportunity cost of management (90% Probability)[a]	450 000	450 000	450 000	450 000	450 000	**450 000**
Return to Risk and Land (Economic Profit)		-126 535	82 558	665 645	-150 996	-438 279	**6 479**

Note: [a]Real opportunity cost of management = Estimated annual real after-tax income in next best line of work x the subjective probability (90%) of securing that job.

APPENDIX 5: Leased Land, Umgeni Municipal District, KwaZulu-Natal

Table A.5.1: RIM Analysis using Real Economic Profit of Leased Land situated in the Umgeni Municipal District, KwaZulu Natal (2006=100)

		2006 R	2005 R	2004 R	2003 R	2002 R	Real Mean R
Revenue							
	Rental income	84 000	84 000	84 000	79 000	79 000	
Less: Maintenance Costs		17 000	15 350	16 000	14 350	12 750	
	Electrics	2 450	2 250	2 376	1 850	1 855	
	Roads	4 100	3 620	4 125	3 868	3 236	
	Fences	5 545	4 980	4 685	4 632	4 059	
	Irrigation	3 125	2 973	3 017	2 250	2 555	
	Buildings	1 780	1 527	1 797	1 750	1 045	
Economic Profit							
	Nominal Economic Profit	67 000	68 650	68 000	64 650	66 250	**66 910**
	Real Economic Profit before income tax	67 000	71 885	73 593	70 966	76 945	**72 078**
	Real Economic Profit after income tax	54 940	58 946	60 066	57 932	57 172	**57 811**
Return to Risk and Land (Economic Profit)		54 940	58 946	60 066	57 932	57 172	**57 811**
Percentage Return on Leased Land		2.80%	3.00%	3.06%	2.95%	2.91%	**2.94%**

APPENDIX 6: Mixed Enterprise Farm, Umgeni Municipal District, KwaZulu-Natal

Table A.6.1: RIM Analysis using Real Economic Profit of a Mixed Enterprise Farm situated in the Umgeni Municipal District, KwaZulu Natal (2006=100)

		2006 R	2005 R	2004 R	2003 R	2002 R	Real Mean
Revenue		3 107 102	2 321 752	1 791 676	2 275 717	1 075 671	
	Cattle	420 782	142 743	193 784	187 653	93 606	
	Sheep	0	0	0	35 172	24 806	
	Poultry	2 115 103	1 469 338	837 995	1 567 455	612 624	
	Maize	267 954	436 508	449 178	82 500	15 800	
	Potatoes	304 610	223 423	298 745	373 427	235 057	
	Disposal of assets	-1 347	49 740	1 000	17 317	93 778	
	Seed	0	0	10 974	12 193	0	
Add: Other Revenue		78 940	34 398	38 882	90 732	84 678	
	Discount received	18 385	8 242	4 988	2 588	6 749	
	Sundry income	26 505	3 956	13 044	6 661	1 310	
	Rental	34 050	22 200	20 850	81 333	58 150	
	Insurance claims	0	0	0	0	18 469	
	Bonus received	0	0	0	150	0	
Less: Variable Costs		2 725 923	2 488 538	2 003 571	2 117 783	1 276 515	
	Business running costs	638 358	473 032	386 356	408 797	390 344	
	Other variable costs	5 183	0	242	67	2 130	
	Cattle	104 871	80 775	70 025	53 657	37 584	
	Sheep	0	0	15 848	19 981	22 158	
	Poultry	1 336 525	1 198 300	903 819	1 125 918	435 716	
	Maize	187 890	322 248	253 485	211 899	36 106	
	Potatoes	229 917	282 544	226 452	185 391	264 508	
	Motor vehicle and tractor expenses	223 179	131 639	147 344	112 073	87 969	
Less: Fixed Costs							
	Depreciation -plant & equipment	88 324	37 434	23 773	22 607	33 798	
Add: Other Receipts							
	Interest received	122	30	0	21	289	
Accounting Profit	Nominal Accounting Profit	371 917	-169 792	-196 786	226 080	-149 675	**16 349**
	Real Accounting Profit (Loss) before income tax	371 917	-177 792	-212 972	248 167	-173 838	**11 096**
	Real Accounting Profit (Loss) after income tax	265 589	-177 792	-212 972	171 100	-173 838	**-25 583**
Less: Opportunity Costs							
	Real opportunity cost of management (70% Probability)[a]	280 000	280 000	280 000	280 000	280 000	**280 000**
Return to Risk and Land (Economic Profit)		-14 411	-457 792	-492 972	-108 900	-453 838	**-305 583**

Note: [a]Real opportunity cost of management = Estimated annual real after-tax income in next best line of work x the subjective probability (70%) of securing that job.

APPENDIX 7: Annual CPI for South Africa, 2000-2006 (2006=100)

Year	CPI (2006 = 100)
2000	74.6
2001	78.9
2002	86.1
2003	91.1
2004	92.4
2005	95.5
2006	100

Source: National Department of Agriculture (2007:99).

APPENDIX 8: Price Indices of Machinery, Trucks and Implements for South Africa, 2000-2006 (2006=100)

Year	Machinery and Implements Index (2006 = 100)
2000	63.3
2001	74.4
2002	95.5
2003	102.0
2004	100.9
2005	99.4
2006	100

Source: National Department of Agriculture (2007: 101).