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**The impact of redistributive land reform on farmland prices in
South Africa**

by

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**A Dissertation submitted in Fulfilment of the Requirements for the Degree of
Master of Science in Agriculture in Agricultural Economics**

Department of Agricultural Economics and Extension

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DECLARATIONS

Declaration on previous submission:

I, Phatheka Somkosi, student number 201408226, declare that this Dissertation titled “The impact of redistributive land reform on farmland prices in South Africa”, submitted for the award of Master of Science in Agriculture: Agricultural Economics in the Faculty of Science and Agriculture at the University of Fort Hare, is my own work and has never been submitted for any other degree at this university or any other university.

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DEDICATION

I dedicate this work to my late parents, Zandisile Somkosi and Nombuliso Alice Somkosi, who passed away on the same day 4th November 2015. They didn't even get a chance of seeing me graduate for my first degree. They are the reason behind all my hard work, it has always been my dream to make them proud and to show them appreciation for raising me to be a strong and independent woman that I am today.

To my younger siblings, Lonwabo and Phelo Somkosi, I want you to be inspired and motivated that anything is possible if you put your mind, heart and soul to it.



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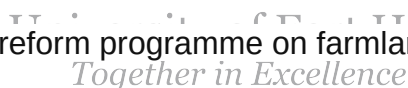
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ABSTRACT

Redistributive land reform remains a pressing focus of social and economic transformation in South Africa. A key point of contention regarding government's approach to redistributive land reform is the fact that the vast majority of the land it acquires is purchased from private land owners. This is widely known as the 'willing buyer / willing seller approach', which is faulted by some critics as making land reform unnecessarily expensive and slow. This study seeks to examine one aspect of this debate, namely the implications of South Africa's land reform programme for the farmland market, which in turn has implications for land reform.

The study is quantitative in nature, using data from 2002 through 2017 pertaining to land reform transactions and market transactions outside of land reform. In particular the data are aggregates at national, provincial and district level. Land transaction data were accessed from two sources, namely from Agri Development Solutions for farmland market statistics based on transactions data captured by the Registrar of Deeds, and from the then Department of Rural Development and Land Reform, which furnished data regarding land reform transactions. Other data sources included the South African Reserve Bank and Statistics South Africa. Descriptive statistics are presented showing trends in the variables under investigation, in particular average price per hectare and hectares transacted. The descriptive statistics and simple statistical tests tend to confirm that land acquired via the land restitution programme is expensive relative to prevailing market prices, while that acquired via redistribution is not. Graphical evidence is also presented to the effect that, at the level of districts, upsurges in the share of land transacted through land reform appear to exert a temporary upward pressure on farmland prices, whereas high prices paid for land reform land do not.

Inferential statistics were done using regressions. In this regard, the Fixed Effects and Random Effects model were used to analyse the findings. Results showed that the redistribution programme has a negative relationship with farmland prices. In other words, redistribution programme lead to a decline in land prices. Therefore, land reform programme is thus not a factor that has contributed to the land price increases in South Africa.

Keywords: Farmland prices, land reform programme, fixed effects and random effects panel regression.



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LIST OF ACRONYMS

ANC - African National Congress

CRLR - Commission on the Restitution of Land Rights

DLA - Department of Land Affairs

DRDLR - Department of Rural Development and Land Reform

ESTA - Extension of Security of Tenure Act

IPILRA - Interim Protection of Informal Land Rights Act

LCC - Land Claims Commission

LRAD - Land Redistribution for Agricultural Development

SA - South Africa

SLAG - Settlement / Land Acquisition Grant

TSG – Tenure Security Grant



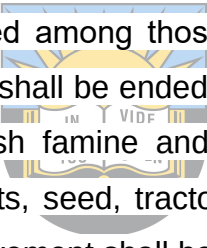
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CHAPTER ONE: INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Black South Africans have been victims of land dispossession and displacement from their ancestral land ever since the arrival of the white settlers in the 17th century, resulting in poverty and insecurity (Bester, 2011). De Beer (2001) notes that South Africa's Natives Land Act No. 27 of 1913 forbade native South Africans, predominantly blacks, from retaining land in areas then declared 'white areas', which totalled to 93% of the area of South Africa. Only 7% of the land was set aside for the exclusive occupation of non-whites, which later was increased to 13% (De Beer, 2001).

Since the beginning of liberation of movements in South Africa, land has remained a central and heated issue. A notable expression of this was the passage in the 1955 Freedom Charter relating to land:

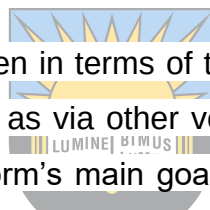


“All the land shall be shared among those who work it, restrictions of land ownership on a racial basis shall be ended, and all the land re-divided among those who work it to banish famine and hunger, the state shall help the farmworkers with implements, seed, tractors and dams to save the soil and assist tillers, freedom of movement shall be guaranteed to all who work on the land and all shall have the right to occupy land wherever they choose, people shall not be robbed of their cattle, and forced labour on farms shall be abolished”. (ANC, 2000)

When South Africa held its first democratic elections in 1994, the African National Congress (ANC) won the majority of votes, hence it was officially elected into power. The ANC government had promised to rectify the land crisis through a “dramatic land reform programme” as part of its proposed Reconstruction and Development Programme (ANC, 1994: §4.3.8). The promised land reform was thought of as a means of changing the racially skewed pattern of land ownership brought about by colonialism and apartheid, increasing incomes and employment, restructuring the agricultural sector in favour of smaller, more ecologically sustainable farmers, and relieve the overcrowding typical of the former homelands (ANC, 1994: §2.4.2 and §4.3.8). Moreover, it was regarded as an ideal method for building common citizenship and ensuring that all citizens can buy land should they need it (Maharaj, 2008).

The Reconstruction and Development Programme (RDP) also identified the distinct aspects of what was expected of land reform, and which subsequently became the basis for the new government's Land Reform Programme. These became known as the three pillars of land reform, namely redistribution, restitution and tenure reform:

- Redistribution is done in terms of the Provision of Land Assistance Act, No 126 of 1993. It addresses various land needs and land users' aspirations in both urban and rural areas, in a just and reasonable way while simultaneously underwriting poverty alleviation and facilitating national economic progression.
- Restitution is pursued by means of the Restitution of Land Rights Amendment Act, No. 22 of 1994. Restitution aims to reinstate land to people or provide equivalent compensation for rights in land which was dispossessed following colonisation as of June 1913.
- Tenure Reform is undertaken in terms of the Extension of Security of Tenure Act, No 62 of 1997 as well as via other vehicles, e.g. for labour tenants and farm dwellers. Tenure Reform's main goal is to upraise different land tenure provisions presently limiting security of occupation for the previously disadvantaged (DLA, 1997).



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According to Bester (2011), initially, this was meant to happen within five years, implying a much more ambitious expectation for the medium and long-term. One version of the story is that the idea of 30% of the land within five years came about by means of a middle-of-the-road short-term planning scenario undertaken by the World Bank on behalf of the ANC, in contrast to which the 10% option was judged too modest and the 50% option too difficult (Aliber, 2008). In view of how far the government fell short of meeting the 30% target, in retrospect the proposed planning scenarios appear highly naïve.

Observers of South Africa's land reform are justifiably uncomfortable with the idea of high agricultural land prices, as these slow down land reform in the sense that a given budget is able to purchase fewer hectares (Obi, 2006; Kriel, 2021). Given the importance of land reform for both material and socio-political reasons, how agricultural land is priced and distributed will continue to be significant policy

questions. This research seeks to examine the interface between the land reform programme and the South African land market. Therefore, it will analyse the status quo in the rural land market and seek to determine whether and how the land reform programme influences it.

1.2 PROBLEM STATEMENT

The issues of land and land reform in South Africa are very topical, hence it has been given much attention by scholars. Researchers have produced numerous papers and articles on the willing buyer / willing seller method in the South African context, focusing mainly on whether the approach favours speedy land reform, and/or on whether reliance on willing buyer / willing seller is 'fair' (Ntsebeza, 2007). Some authors contend that the willing buyer / willing seller approach is a major factor in the slow progress of land reform programme (e.g. Jacobs et al., 2013; Hendricks, 2013). Notably, the 2005 Land Summit recommended the dismissal of the willing buyer/willing seller method and increased state intervention in the land market so as to accelerate the land reform programme. Underneath this call are a number of specific claims with regards to the problem of relying on the land market, e.g. land is not available at a reasonable price where it is needed; landowners inflate their asking prices when trying to sell for land reform purposes; and the additional demand for land via the land reform programme creates an upward pressure on land prices, thus undermining land reform itself. This latter possibility is arguably one of the most damning regarding the efficacy of the willing buyer / willing seller approach:

“To the extent that farmland is scarce it is likely to be in price-inelastic supply, i.e., a rise in the demand for it leads to a substantial rise in price and only a small rise in the amount supplied. In such cases, a rise in the total demand for land will sharply raise land prices. Even announcing that the poor are to receive support to buy land from the rich, e.g. by grants (including land vouchers) or loans, raises land prices.” (Lipton, 2009: 270)

A similar point has been made by others, e.g.: “If implemented, large-scale market-based agrarian reform will drive up land prices, effectively excluding poor farmers from the benefits of reform” (Riedinger *et al.*, 2001: 364). Dlamini (2014) stated that, out of the 120 million hectares making up South Africa’s total land, 84 million hectares are

agricultural land owned by white people. In terms of its 30 per cent target, government had planned to redistribute 22 million hectares of this land at least by the end of 2014 (Dlamini, 2014). As will be shown below, however, recent statistics put the share of land redistributed has barely surpassed 10%.

To what extent is this failure to achieve its target due to the willing buyer / willing seller approach, and in particular the process by which land reform makes land more expensive? This study thus aims to make a significant contribution towards in exploring these questions.

1.3 OBJECTIVES

The current study seeks to examine the effect of the land reform programme on South African land prices, and thereby better appreciate the limitations of the current reliance of the land reform programme on the land market.

Specifically, the study will aim:

1. To examine the trends over time in agricultural land prices and market volumes.
2. To determine the trends over time in prices paid and hectares acquired by the land reform programme.
3. To examine the influence of the South African land reform strategy on land prices.



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1.4 RESEARCH QUESTIONS

Accordingly, the research questions guiding the study are as follows:

1. What are the trends of agricultural land prices and market volumes over time?
2. What are the trends of prices paid and hectares acquired by the land reform programme over time?
3. What is the influence of the South African land reform strategy on land prices?

1.5 DELIMITATIONS OF THE STUDY

This study is limited to the yearly data captured during the period 2002 to 2017 and did not include any data from earlier years of the enactment of the South African land reform strategy. Furthermore, the focus of the study is on redistributive land reform,

which in the South African context means the so-called 'land redistribution programme' and 'land restitution programme'; it does not consider tenure reform, which is an important aspect of land reform that does not, however, generally involve the transfer of significant numbers of physical hectares.

Beyond this, the quantitative nature of the present research means that it is unable to delve into the subtle workings of the land market, more particularly what happens what government or prospective beneficiaries seek to negotiate with current land owners.

1.6 SIGNIFICANCE OF THE STUDY

Redistributive land reform in South Africa is about making land available to black people who were previously dispossessed of it or denied an opportunity to access it. The ultimate aims are various: to effect restorative justice; to create opportunities for farming; and to promote nation-building by means of altering the racially-skewed pattern of land ownership. Over a quarter of a century from the beginning of the land reform programme in 1994, only moderate progress has been made in respect of these goals, leading to simmering if not overt popular frustration.

One of the main culprits identified for the slow progress is the so-called 'market-based' or 'market-assisted' nature of the land reform that has been attempted. That claim in itself has a number of angles. The specific angle pursued in this study is that market-based land reform is slow because current land owners charge too much for their land, and they do so all the more when or where land reform is relatively concentrated.

Issues pertaining to land reform within the South African context carry an argumentative if not historical bearing, especially on the marginalised majority that had their agricultural land taken by the settlers. How we should proceed with land reform remains a burning question. This research will help answer two important questions: First, does 'land reform land' (meaning land acquired and made available by the land reform programme) tend to be more expensive than other land changing hands on the market? And second, does redistributive land reform lead to land price inflation, which in turn would undermine land reform? This study seeks to add to the available literature on the influence of the land reform on the country's land market.

1.7 ORGANISATION OF THE STUDY

This dissertation comprises of five chapters. The first chapter provides an outline of the study, underlining the background and introduction, problem statement, objectives and significance for the study. The following chapter gives a thorough review of the land reform programme in the South African context. Following this, general land issues in terms of the policies, politics, and economics of land in South African are reviewed. Chapter Three covers the study's methodology by describing the study's framework of data analysis, the research design, research approach, research method used and the description of the data set utilised. Chapter Four presents the results of the research, including both for the district and provincial levels. The agricultural land price trends and the land reform programme (restitution and redistribution) trends in South Africa are illustrated in this chapter. The summary, discussion and recommendations of the dissertation are discussed in Chapter Five.



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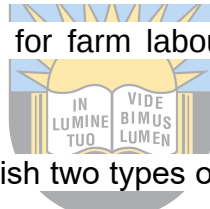
CHAPTER TWO: LITERATURE REVIEW

2.1 INTRODUCTION

The preceding chapter outlined the problem statement and the background of the study. Chapter Two reviews the literature regarding land reform in South Africa, land markets, and the role of land markets in South Africa's land reform.

2.2 REDISTRIBUTIVE LAND REFORM

Throughout the world, human rights are increasingly recognised as pivotal in human development (UNDP, 2002). Secure tenure is an internationally recognised human right; this right includes the human right to livelihood and land. International law respects that people depend on land for their livelihoods in order to survive (PDHRE, 2006). In confirmation of this, EL-Ghonemy (2001) notes that land reform is predominantly a basic human rights issue. It involves access to land and the benefits of access on fair and safe terms for farm labourers and those whose livelihoods depend on it.



Broadly speaking one can distinguish two types of land reform, namely 'redistributive land reform', and 'tenure reform'. To paraphrase Adams et al. (1999), tenure reform refers to a planned change in the terms and conditions on which land is held, used and transacted, often with the goal of strengthening people's land rights, not least those who are vulnerable.

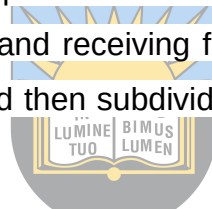
By contrast, redistributive land reform generally refers to government-initiated or government-backed redistribution of land from one party to another; in some instances, the party from whom the land is being sourced is compensated, whereas in other cases there might be no compensation (Lipton, 2009).

Some land reforms are not easily classified as the one or the other, for example those undertaken in Japan and Taiwan immediately following World War II. In these so-called 'land-to-the-tiller' reforms, ownership rights previously vested in landlords were transferred to tenants (Lipton, 2009).

As noted above, redistributive land reform be regarded as a human rights issue, e.g. to redress land inequalities created by past historical injustices. However, there are

also economic motivations. The most frequently cited of these is that converting large farms to small farms increases absorption of labour, because small farms tend to be more labour-intensive than large ones, which is desirable in societies with high rates of unemployment and poverty (Lipton, 2009). However, arguably this in itself is a human rights issue, insofar as addressing poverty is widely regarded as a human rights imperative (United Nations High Commissioner for Human Rights, 2012).

Approaches to redistributive land reform can be divided into three, namely: the state-led approach, the community-based approach and the market-assisted approach (Kepe and Hall, 2016). In a state-led approach, it is the role of the state to take control of policy meant to redistribute land. The community-based approach is different from the state-led approach to land reform in that it is initiated 'from below', meaning by ordinary people, such as those in need of land. Recently this approach has emerged as a replacement for a state-led approach (Kepe and Hall, 2016). The market-based approach involves the use of the open market for effecting land transactions. It might involve those individuals without land receiving finance to acquire land by buying it from those owning large farms and then subdividing it among themselves (Cotula et al., 2006:13-18).



Other than its role in contributing to economic growth, a reasonably fair access to land can facilitate poverty reduction by making sure that the benefits of land access are equitably shared, whereas land concentration favours those at the top of the income distribution (Deininger and Squire, 1998). In rural communities, land and labour are the households' key factors of production, with land as the main asset for building wealth (Vendryes, 2014). In this regard, in most rural African rural areas there is a strong relationship between access to land and household income (Manyanga and Jayne, 2014), making the redistribution of land a key focus in endeavours to reduce poverty.

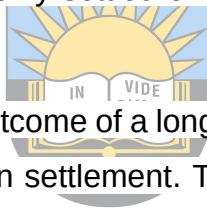
2.3 LAND AND LAND REFORM IN SOUTH AFRICA

In South Africa, land reform is described as the reallocation of land to cater for those previously dispossessed of land as well as labour tenants and farm labourers (Lahiff, 2008).

2.3.1 The land issue during the colonial and Apartheid eras

The history of land in South Africa makes the issue of land important to the vast majority of rural people. The inequitable land ownership patterns resulting from South Africa's past has presented land reform as an issue of basic human rights. The South African Constitution confirms that rights in land are a human rights issue, and as such enjoins the State to “take reasonable legislative and other measures, within its available resources, to foster conditions which enable citizens to gain access to land on an equitable basis” (Constitution of the Republic of South Africa, §25(5)).

However, rights pertaining to land access and tenure security continue to be undermined. Forced evictions are a violation of basic human rights including those in land (PDHRE, 2006). DRDLR (2005) documented the extent of evictions from South African farms. Since 1994 almost 1 million people have been evicted from farms and 2.35 million people have been displaced from farms. Whereas the land reform programme, for the same period, only settled or secured tenure for around 170 000 households.



Current land inequalities are the outcome of a long period of land dispossession going back to the early days of European settlement. The initial legislation which reflected the segregation was the Natives Land Act 27 of 1913 (Atauhene, 2011). The Act prohibited black people from purchasing, acquiring or agreeing a transaction which relates to land. Any transaction concerning purchasing or acquiring land was mainly based on approval from the Governor-General. As an outcome of this legislation, black farmers were extremely marginalized by the system, furthermore, only 8% of the land was designated for use by black South Africans (Atauhene, 2011). The Natives Land Act later served as the basis for apartheid-era spatial discrimination in relation to black ethnic groups, e.g. Xhosa, Zulu, Tswana and so on.

In the aftermath of the release of former South African president Nelson Mandela and the lifting of the ban on the African National Congress (ANC), the National Party passed the Abolition of Racially Based Land Measures Act No. 108 of 1991, which finally repealed the 1913 Natives Land Act. The National Party government also introduced the Provision of Certain Land for Settlement Act, 126 of 1993, which empowered the government to undertake land redistribution. Although Act 126 still serves (albeit in amended form) as the main piece of legislation enabling land

redistribution, in general the National Party's late efforts to address the land inequalities wrought by colonialism and apartheid amounted to little.

2.3.2 The 1997 White Paper on South African Land Policy

The *White Paper* on South African Land Policy (Department of Land Affairs, 1997) focused on crafting a comprehensive land reform policy. It focused on the inequalities which were a result of forced removals, in just land ownership and prioritising utilisation of land. The *White Paper* argued that the present inequalities could not be resolved without addressing past imbalances created by the apartheid era (Cousins, 2007). With regards to this situation, the purpose of the *White Paper* was to describe in greater detail the three main pillars of the land reform, that is, redistribution, restitution and tenure reform:

- Land redistribution aims to give the poor access to residential land and land for agricultural purposes to improve their quality of life. It also aims to assist the underprivileged, farm employees and new farmers.
- Land restitution's main objective is to restore land and provide other remedies to people dispossessed by racially discriminatory legislation and practice.
- Tenure reform must address a range of problems arising from settler colonisation and dispossession. This programme deals with land rights where people are living.

The *White Paper* also stated that central to land reform were the principles of viability and sustainability. These principles would be achieved through the social and economic feasibility of the planned land use, environmental sustainability, fiscal sustainability of local authorities, access to markets, increased employment, and availability of infrastructure and water (White et al., 2013).

2.3.3 Land Redistribution

Land redistribution entails land acquisition by the state for purposes of making available to those without or those with inadequate access to land. Redistribution has changed multiple times since 1994, though it has always depended almost entirely on willing buyer / willing seller.

2.3.3.1 The Settlement/Land Acquisition Grant

During 1994 to 1999 the redistribution programme was based on the Settlement / Land Acquisition Grant (SLAG), which was provided by the Department of Land Affairs (DLA) on behalf of poor black South African households to help them purchase land on the market (DLA, 1997). The value of the grant was limited to R16000 per household for buying, upgrading, and making use of farmland, and, as the name of the grant implies, in principle also for settlement. The implication was that households had to come together to apply as groups to purchase farms (Rugege, 2004; Lahiff, 2008). In addition, they were encouraged to secure loan finance, and the Land and Agriculture Bank made a concerted effort to lend to such applicant groups. Even despite such lending, to make up the acquisition costs, applicant groups often became quite large, leading to the characterisation of 'rent-a-crowd' (White et al., 2013).

Not only did households apply and acquire land in groups, after acquisition they virtually always sought to farm the acquired property as a group. This often resulted in what was often described in policy circles as 'group dynamics', meaning that beneficiaries struggled to work together according to plan (White et al., 2013). The poor performance of SLAG, in particular the manner in which the small size of the grant led to the creation of sometimes large beneficiary groups, motivated government to replace it with a different approach to redistribution (Hall, 2004).

2.3.3.2 The Land Redistribution for Agricultural Development programme

The poor performance of the SLAG programme led to its suspension by the former Minister of Agriculture and Land Affairs in July 1999, with an instruction that a new redistribution vehicle be introduced (Hall, 2004). The new Land Redistribution for Agricultural Development (LRAD) was thereafter launched in 2001 with the main objective of creating sustainable black farmers, while contributing to the transfer of 30% of the country's agricultural land (estimated to be 86 million hectares) from white farmers to black farmers by the year 2014 (Department of Land Affairs, 2003).

The LRAD programme had the following characteristics, of which some were in common with the SLAG programme, but others were not:

- Endowing and accommodating people from previously disadvantaged backgrounds to acquire land, with the difference that 'beneficiaries' were now

defined as adult individuals rather than households, and that beneficiaries no longer needed to qualify as poor in terms of their annual income.

- Increasing the amount of the grant from R16 000 per households, to a range of grants per individual adult from R20 000 to R400 000, depending on the extent of the applicants' own contribution, which could take the form of agricultural assets (e.g. livestock or machinery) or a bank loan.

The LRAD programme was meant to be flexible and simple in that land recipients could use it to suit their own goals and in line with their resources. Beneficiaries could make own contributions in different amounts according to their capability. Given the flexibility and demand-driven nature of the programme, recipients were able to define the size and type of projects they wanted to start.

LRAD provided an excellent vehicle for redressing gender imbalances in land access and land ownership. The sub-programme will serve as a means of creating opportunities to enable women to develop in numerous spheres of life, therefore giving them security against poverty and providing them independent economic status. By ensuring that women participate fully in asset redistribution and agrarian reform, the sub-programme will help government meet its international commitments, for example in terms of the Beijing Platform for Action (1995) and the Convention on the Elimination of All Forms of Discrimination against Women (1996).

According to Prinsloo (2009: 25-26), the most common critique of the LRAD sub-programme was its slow pace, which was said to be caused by two main factors, namely the bureaucratic process and the limited size of the LRAD grants.

2.3.3.3 Proactive Land Acquisition Strategy (PLAS)

The concept of the Proactive Land Acquisition Strategy (PLAS) was introduced by the Minister of Agriculture and Land Affairs during the National Land Summit of 2005. One of the measures that needed to be in place was “to ensure that land and agrarian reform moves to the new trajectory that will contribute to the higher path of growth, employment and equity by 2014” through the “introduction of proactive land acquisition by the state for targeted groups in the land market” (MALA, 2005: 45) This move was perpetuated by political pressure for government to accelerate land reform; implicitly, the idea was that the demand-led nature of LRAD – together with the fact that it was

applicants' responsibility to identify available land – constrained its speed. The market-based land acquisition wherein the state would purchase land prior to identifying beneficiaries, was initially rejected by the State on the grounds that the 'supply led' approach would risk the state being left with land which it could not maintain or dispose of (Desai, 2018). Under PLAS the state became the 'willing buyer' of land for redistribution, "by actively using market opportunities where they arise" (Lahiff, 2008: 7) in order to accelerate the land redistribution process.

The legislative framework on which PLAS is based remains the Provision of Land and Assistance Act, Act No. 126 of 1993. Section 10(1) (a) gives legal effect to the proactive acquisition of land, "The Minister may, from money appropriated by Parliament for this purpose- (a) acquire land for the purposes of this Act." PLAS targets black people (Africans, Coloureds and Indians), groups that live in communal areas, black people with the necessary farming skills in urban areas and people living under insecure tenure rights. In principle, the rationale is to contribute to the decongestion of the communal areas, secure on or off-farm accommodation and to create sustainable livelihoods (Zhou, 2017). Additionally, the strategy also intended to cater for emergent and commercial farmers. As with LRAD, the main target of PLAS is individual emerging farmers as opposed to groups (Department of Rural Development and Land Reform, 2005).



2.3.3.4 One-Household One-Hectare programme

The Minister of DRDLR launched the One Household One Hectare programme in November 2015 (DRDLR, 2017). The main objective of this programme was to assist in reducing poverty in rural areas. In most cases, households were required to acquire a site for farming or plant. In cases of communal land, traditional leaders are required to play a central role in the operation of the cooperative. To be eligible for benefits, households must organize themselves as registered cooperatives. Each of the cooperatives has to save 10% of its profits for the next production cycle to ensure sustainability (DRDLR, 2017).

There is virtually no literature as to the impact or performance of the One Household One Hectare programme, nor is it clear whether the programme still exists. For instance, there is no mention of it in the Annual Performance Plan for 2021-22 of the Department of Agriculture, Land Reform and Rural Development (the name of the

department that emerged from the union in 2019 of the Department of Agriculture, Forestry and Fisheries and DRDLR) (DALRRD, 2021). In any case, what one can see from the limited information available is that the programme did not entail its own method of securing land, rather the land was meant to be either state land already in the Department's custody, or new land acquired via PLAS or the restitution programme. (DRDLR, 2019: 17).

2.3.4 Land Restitution

The land restitution programme aims at the compensation of land rights to those who were removed by force from their rightful land since the start of formal land dispossession in 1913. The Land Claims Commission particularly deals with land entitlements and compensation of the current owners and compensation also to the claimants. Within the restitution process, the dispossessed individual or group either receives back their original piece of land (or similar property) or receives a monetary compensation. This programme is governed by the Restitution of Land Rights Act 1994 (Act no 22 of 1994 as amended).

The *White Paper* stipulates that land restitution aims at reinstating land and providing other restoration methods to “people dispossessed by the racially discriminatory statute in order to support and promote the process of reconciliation, reconstruction and development” (DLA, 1997: 74-75). Restitution is an important political project, but its potential to transform the urban and rural legacies of spatial apartheid has been curbed by problems in acquiring land and overwhelming pressure to accept financial compensation, particularly in urban claims (Hall, 2004). Despite real progress in the rate at which claims have been settled, the majority of the large, complex rural claims that hold the most potential to address racial imbalances in land ownership and economic opportunities in South Africa's countryside remain unresolved (Ferguson, 2015).

While restitution was conceived as a form of historical or restorative justice, there are allegations that it relegated people to ‘dumping grounds’ without resources for development prompted the Commission on the Restitution of Land Rights (CRLR) to adopt a more developmental approach (Hall, 2004). According to Hall (2004: 664), restitution has thus taken on many of the characteristics of the programme for discretionary redistribution. In order to show how they intend to use the land that is

legally theirs, claimants are expected to provide business plans, development plans, and land use plans. While the planning approach has the merit of leveraging in additional support from other government departments and support from the private sector, it is important not to lose sight of the rights of claimants to use their land as they see fit (Hall, 2004). Hall (2004) stated that, land rights cannot be restored if claimants are unwilling to follow the state's development planning priorities.

2.4 LAND MARKETS

2.4.1 Land as a commodity

Wallace and Williamson (2006) delineate five stages in the evolution of land commodification, noting that the conditions occur in different places at different times, but according to a similar pattern:

A functioning society always needs to rationalise the relationships between people and land; trading in commodified land is one of the easiest methods of rationalisation, especially when compared with bureaucratic or centralised allocation. Commodification of land is ancient; instances of sales are recorded in the earliest of human writings. Land was commodified 4000 years ago: two conditions are regarded as essential – literacy and scarcity. Industrial capitalism is not, though it is the engine of a complex market. (Wallace and Williamson, 2006: 128)

In other words, while land commodification pre-dates modern capitalism, modern capitalism has driven land commodification further along the evolutionary path.

However, while some analysts see the commodification of land as a more or less inevitable by-product of – if not condition for – economic development, others regard the commodification of land as suspect and regrettable.

Marx (1986) states that considering land as a commodity can possibly hinder the acknowledgement of the different values associated with the land, a different range of land use patterns, socio-political memories, and the acknowledgement different kinds of relations people have with each other and “to the land in terms of history, identity, community, gender, age, and religious and cultural beliefs”. Walker (2001) observes that,

“A secure place to live has so much value for poor people in their struggle to survive; going beyond the material resources that the land offers in itself. Land also carries a huge significance at a political level. Therefore, the land reform’s main mandate is to return land that was stolen, used to dispossess and that which enkindled the fight against the Apartheid government by the black South Africans. On a small scale. Land is characterised with cultural and emotional meaning at an individual and community scale. It is thus seen beyond its purely utilitarian value. Land is very influential in South Africa and it promotes a sense of social identity amongst citizens, particularly those residing in the rural areas”.

2.4.2 Properties of land markets

The classical economists took it as given that the institution of private property in land emerged out of population pressure and scarcity, and that property markets followed suit. Adam Smith, for example, contrasted the lands one could acquire in the 18th century in North America “to be had almost for nothing”, with those “in Europe, or, indeed, in any country where all lands have long been private property” (Smith, 1976: 551). Boserup elaborated, however, that population-driven scarcity was not sufficient to induce the emergence of private landownership; a second essential ingredient is the “penetration of money transactions” (Boserup, 1965: 76). In recent years, it is acknowledged that land markets are emerging across sub-saharan Africa, regardless of whether they are legal (i.e. recognised by the State) or otherwise (Holden and Otsuka, 2014; Jayne et al., 2021).

A long-running question regarding land sales markets is their impact on efficiency and equity (Wineman and Liverpool-Tasie, 2016). In terms of equity, land markets may allow for the concentration of land in the hands of the rich minority, however they can also promote equity by means of functioning as another opportunity for land access for those with a little inheritance (Wineman and Liverpool-Tasie, 2016).

The influence that sales and rental markets have on the distribution of land in developing countries particularly remains a critical issue. Fair access to land is deemed as crucial for both the speed of agricultural growth and the level to which such growth reduces poverty (Deininger and Squire, 1998). Land markets, especially the ones operative in customary settings, are a crucial possibility for rural households to

access land. However, these land markets are poorly understood and often disregarded in policy dialogues (Chimhowu and Woodhouse, 2006), with little empirical evidence for basing judgements concerning their advancement or restriction (Deininger and Mpuga, 2009). Having said that, Lipton summarises evidence that the superior productivity of small-scale farms in many instances has enabled land-poor households to rent land in from larger landholders (Lipton, 2009: 92). Holden and Otsuka (2014) summarise the relatively sparse evidence from East Africa showing that land sales markets tend to result in slightly more egalitarian land holding patterns.

Land market is mainly important for circumstances where markets for other factors of production are imperfect or missing. Two main beneficial properties of land markets have been identified, of which one relates to the 'capitalisation effect', whereby investment into land – for instance, land improvements that augment a farm's productive capacity – factors into the land's market value, meaning that the market ultimately creates an incentive for such investment. The second beneficial property is the 'distribution effect', according to which the opportunity for market exchange allows for the property to end up in its socially optimal (e.g., most profitable) use, on the grounds that those capable of using a property more profitably will outbid those who are less capable.

Land markets are usually conditioned by land tenure and land administration systems, as well as by zoning regulations. An important issue regarding land tenure system consists of the degree to which land can be acquired or released through selling. Customary tenure systems typically forbid sales of land (Holden and Otsuka, 2014), presumably because of the disruption they would pose to community cohesion; statutory systems in some developing countries also often forbid sales, generally for fear that they will result in widespread landlessness (Holden and Otsuka, 2014).

However, land markets are generally seen as integral to the functioning of modern market economies, in particular because markets make land available for development, which contributes to economic growth (Wineman and Liverpool-Tasie, 2016). An effective land market is linked to how a nation's economy performs. In most developed societies, there is usually much activity in land markets. According to Colin and Woodhouse (2010), an efficient land market is one which: allows for speedy land transactions and land development; is accessible to all income groups; land is used in

an environmentally sound manner so as to protect its sustainable use for the sake of current and future users.

2.4.2 Theories of agricultural land price formation

Theories of land value should have the intellectual capacity to clarify and provide predictions relating to market outcomes, for instance regarding the price and volume of transactions. The two most prominent theories are discussed below.

2.4.2.1 Present value model

The present value model – also sometimes referred to as the capitalisation model – assumes that the value of an enterprise or of a productive asset, is the sum of expected future net benefits accruing to the owner discounted in proportion to how far into the future they are expected (Holden and Otsuka, 2014; Basha, 2021). In other words, future earnings are ‘capitalised into’ the current valuation of the enterprise or asset. As such, the concept of present value provides a method for evaluating and comparing capital projects or financial products with cash flows spread over time, as in loans, investments, and pay-outs from insurance contracts (Wineman and Liverpool-Tasie, 2016). Owning farmland lends itself to present value analysis because having a productive asset such as land allows for the receipt of profits into the future, in principle indefinitely. In other words, the net present value approach is an approach that can be used to estimate the productive value of farmland, with the further assumption that productive value is the ultimate basis for the market value of that farmland.

Below is a generic formula for net present value taken from Mela et al. (2016), in which V_t represents the net present value of a productive asset at time t , M_{t+i} are the expected annual returns from the asset into the future (i.e. at times t , $t+1$, $t+2 \dots \infty$), G_{t+i} are annual net transfers to/from government into the future (e.g., agricultural subsidies less taxes on farm profits), and r_{t+i} are the discount rates at time t , $t+1$, etc.:

$$V_t = \sum_{i=1}^{\infty} \frac{M_{t+i} + G_{t+i}}{(1 + r_{t+1})(1 + r_{t+2}) \dots (1 + r_{t+i})} .$$

The function allows for the possibility that returns, net transfers, and discount rates will vary over time, but since typically these are not known in advance, a common

simplification is to assume that they are constant, in which case the formula simplifies to the expression for a perpetuity:

$$V_t = \frac{M + G}{r}.$$

The approach can be used to estimate the value of a single farm, or of agricultural land in an area or country.

Mela et al. (2016) present a version of the formula above which allows for non-agricultural considerations to affect farmland values:

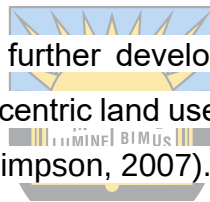
$$V_t = \sum_{i=1}^{\infty} \frac{M_{t+i} + G_{t+i}}{(1 + r_{t+1})(1 + r_{t+2}) \dots (1 + r_{t+i})} + ALIA_t,$$

where $ALIA_t$ captures non-agricultural influences on land value such as climate change and the possibility of urban development (Mela et al., 2016: 5). Farmland owners are aware of changes in the settlement and ownership of land in their local surroundings. The Not in My Backyard (NIMBY) phenomenon refers to the situation in which one or more community members object to the introduction of what they regard as an undesirable entity (such as a hazardous waste dump or prison) close to their residences out of concern for potential negative effects on their property values (Zhao et al., 2020:2). By the same token, some local developments (e.g., new school or shopping centre) could in principle increase the desirability of living in a particular place, and thus enhance property values.

Thus, the model is useful both conceptually and empirically; conceptually because it provides a clear, parsimonious model for understanding the value of a productive asset based on basic economic principles; and empirically, because the model can serve as the basis for various estimation procedures, as will be discussed more in 2.4.3 below.

Various other theories that have been used to explain differential farmland values can arguably be regarded as particular cases of, or amendments to, the present value model, at least in the sense that they share the premise that the value of a piece of land relates to its qualities and use in economic context. Foremost among these are Ricardo's model of land rents, and von Thunen's bid-rent theory.

In 1821 David Ricardo published *The Principles of Political Economy and Taxation*, in which, among other things, he developed his argument as to the economic origins of land rents, i.e. what a land owner is able to charge a maize producer for the use of the land. He argued that the land rent of a parcel depends mainly on the inherent fertility of that piece of land. Within a context of limited land, those plots that are relatively fertile fetch relatively high rents because they afford the user a relatively high surplus, whereas those that are relatively less fertile (but which must be used in order to satisfy the food needs of the population) fetch relatively little rent. While Ricardo's overall framework was more elaborate than portrayed here, and although it has been criticised for some of its severe assumptions (e.g., that fertility can be neither enhanced nor destroyed, and that capital and labour are perfectly elastically supplied; see e.g. McDonald, 2018), it does capture a valuable truth that in a sense anticipated the present value model, namely that agricultural surplus (i.e. profits) and land rent are integrally related.

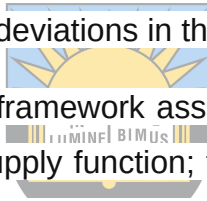


Ricardo's basic insight has been further developed in various ways. One notable contribution was von Thünen's concentric land use model, which he published in three parts starting in 1826 (Sedjo and Simpson, 2007). The essence of the model was that in the centre of the concentric rings was the urban core, where consumer demand was concentrated. Given transport costs, those land uses that produced a higher surplus tended to be located closer to the urban core, whereas those that produced a lower surplus tended to occupy the rings further away. This allowed von Thünen to distinguish between relatively intensive forms of agriculture such as dairy and vegetable production, which occupied a ring relatively close to the city; followed by a ring of fuel-wood producing forested land, followed in turn by extensive field crops, and then finally extensive grazing. Agricultural enterprises further from the centre incurred higher transport costs, which would be subtracted from the revenues of the enterprise, thus reducing the rents that could be charged for use of the land. Thus, in von Thünen's model, differential rents were a function not of the variability in inherent land quality, but of geography (Sedjo and Simpson, 2007).

2.4.2.2 Neo-classical supply and demand theory

Neo-classical supply and demand theory provides the other main theoretical basis for the determination of land prices. Where the supply and demand perspective is

arguably most helpful is to explain why the traditional net present value model is not always correct when it comes to understanding the value of agricultural land. As Riedinger et al. (2001) noted generally in their critique of market-assisted land reform, market value often exceeds productive value, where the latter is usually defined in terms of the net present value approach. Riedinger et al.'s specific scenario is that an exogenous demand shock exerted by land reform would disturb the market equilibrium of land, thus pushing up its price, particularly in light of an inelastic land supply. The more typical concern in the literature is that farmland is not simply a factor of production, but also an asset, which like other assets may be subject to speculative pressures. As stated by Burt, "Most of the emphasis has been on theoretical and empirical models which place expected capital gains in a dominant position, in contrast to the classical theory where expected net rents explain land prices" (Burt, 1986: 10). In a sense, then, one might suppose that the net present value approach reflects the 'market fundamentals' which govern farmland prices in the long-run, whereas demand and supply dynamics help explain deviations in the short-run.



The conventional supply-demand framework assumes a downward-sloping demand function and an upward-sloping supply function; the intersection of the demand and supply functions indicate the equilibrium combination of demand and supply for the commodity in question. While land markets may operate according to these same principles, a common belief is that because of the fixed short-run supply of agricultural land, "price may be assumed to be demand-determined" (Phipps, 1984: 423). However, there is some debate on the nature of land supply. There is a tendency in the literature to describe the supply of land as inelastic owing to the fact a given geographical area has a fixed endowment of land, so that increasing the supply of agricultural land must come at the expense of some other land use, which could only happen slowly. Burt makes the case forcefully, which is not to say clearly:

"Some attempts were made in the 1960s to model land prices in a simultaneous equations' framework..., but the performance of such models was most discouraging. The rather artificial viewpoints taken to provide a classic market framework and identified supply and demand equations are probably at the root of the failure of such models. A classic supply function for agricultural land does not exist; moreover, using proxies such as number of farms sold as a measure of quantity supplied is inappropriate. Quantity supplied is fixed in a given year,

and therefore, predetermined for statistical purposes in a time-series sample”.
(Burt, 1986: 11)

What is unclear is why the number of farms sold (or their collective hectarage) is “inappropriate” as a measure of supply. As stated by Hurlburt three decades earlier,

“Too often there is confusion between these terms. Admittedly, in the quantity sense, the total geographic area of land (no matter how defined) is fixed. But this does not necessarily mean that the number of tracts or acres to be offered for sale on the market will not vary with price of land”. (Hurlburt, 1958: 161)

In any case, as explained below, the real fault with the demand-supply framework is that it has proven difficult to operationalise.

2.4.3 Empirical approaches to modelling farmland prices

There are three main methods to modelling farmland prices, namely demand and supply models, net present value models, and hedonic pricing models.

Demand and supply models typically involve econometric modelling of systems of equations, for instance using two-stage least squares, of which one equation is for supply and one for demand. One such model was used by Herdt and Cochrane (1966) to model US farmland prices:

Supply equation: $P = f(R, U, L_f, N^S)$

Demand equation: $P = g(R, T, P_r/P_p, L_u, G, N^D)$, and

Market-clearing equation: $N^S = N^D$,

where N^S is number of farms supplied per 1000 farms, N^D is the number of farms demanded per 1000 farms, P is average per acre price of farmland, R is the interest rate, T is an index of productivity, U is the unemployment rate, L_f is the total number of acres of land in farms, P_r/P_p is the ratio of farm gate output prices to input prices, L_u is the amount of urban land, and G is the general price level or wholesale price index.

In general, it would seem that this approach has fallen out of favour, in part because of the difficulty of modelling land supply noted above (Burt, 1986). Indeed, even recent

research aiming to estimate farmland supply elasticities seems to be largely based on the net present value approach (Tabeau et al., 2017).

The operationalisation of the net present value approach takes a variety of forms, but generally involves some kind of econometric analysis of time series data, pooled cross-sectional data, or panel data. It does not necessarily involve a functional form bearing any resemblance to the equations in 2.4.2.1 above, but rather some kind of regression analysis in which farmland prices are a function of variables having a bearing on farm profitability. For instance, Mela et al. (2016) studied the determinants of farmland values in Italy using a correlated random effects model based on annual data for 20 regions, in which the explanatory variables include agricultural prices, a farmland productivity index, stocking rates, subsidies per hectare. However, they also included population density as an explanatory variable on the premise that this might be expected to further affect land prices, in that higher population density would reflect greater non-agricultural demand for farmland in the area. Devadoss and Manchu (2007) modelled farmland prices in the Snake River Valley of Idaho, United States, based on annual data for 15 counties, using a fixed effects model in which the explanatory variables include net farm income, government subsidies, and various macroeconomic factors and demographic characteristics. Similarly, Basha et al. (2021) used an auto-regressive distributed lag model on state-level, annual farmland data from the mid-western United States from 1963 through 2018, in order to capture the dynamic relationship between farmland values and interest rates, controlling for farm income. In general, there are numerous variations on the net present value approach, relating to different sets of explanatory variables, different types of data (mostly panel but sometimes cross-sectional or time series), and econometric treatments.

The third main empirical approach to studying price formation is the so-called hedonic pricing model. The underlying assumption of hedonic pricing models is that utility-maximising agents place a value on an asset in respect of its various attributes, so in effect what they are willing to pay for an asset reveals their underlying preferences. Such models are particularly common for urban real estate, where for example the value of a property can be regarded as a function of its size, distance from the nearest school, number of bedrooms and bathrooms, type of roof, etc. Such models have also been applied to farmland, and in general do not look particularly different from net

present value models, except that they are more apt to include explanatory variables that do not relate directly to the economic returns expected from agricultural land use.

Thus, for example, Ma and Swinton (2012) tested a hedonic pricing model for cross-sectional, farm-level data from South Western Michigan, United States, in which the sales price of parcels was a function of each parcel's land use, location relative to water bodies, quality of drainage, average slope of terrain, number of farm and residential buildings, etc. Similarly, Choumert and Phélinas (2014) used cross-sectional parcel-level data from the Pampas region of Argentina to study the impact of tenure type and use of genetically modified soybean seed on farm values; the methodology consisted of Ordinary Least Squares using a semi-log functional form, with explanatory variables such as distance to the main road, quality of the land, use of crop rotation, etc. Although the application of hedonic pricing models to farmland price determination appears to usually involve farm-level data, Ghidoni et al. (2016) implemented a fixed effects model for third-level territorial units (known in Europe as 'NUTS 3') in Italy and Germany for 2000 and 2010, in which the natural logarithm of the average land price was a linear function *inter alia* of gross value added per capita, average price per square metre of urban construction, average farm size, share of farmland that is grazing, and agricultural gross value added. A particular advantage of the fixed effects model is that it can accommodate unobserved unit-specific characteristics.

Together in Excellence

A common feature of hedonic pricing models in the context of farmland price determination, is their use in testing for the influence of non-agricultural variables, that is, variables which do not clearly relate to the returns to agriculture but might affect the value of agricultural land. Examples of such variables include proximity to urban areas, or the presence or absence of wetlands or other ecosystem services. When used for urban real estate, hedonic pricing models have frequently been used to measure the influence of proximity to amenities and/or dis-amenities, such as parks and recreational facilities (Schläpfer et al., 2015), petrol stations (Zhang et al., 2018), and waste transfer stations (Zhang et al., 2018).

2.5 LAND REFORM AND THE LAND MARKET IN SOUTH AFRICA

According to Deininger (1999), it is extremely challenging for poor land seekers or small-scale farmers to access credit markets. The situation is made worse by the mere

fact that there are difficulties in acquiring land in the sales market with the hope of paying off the debt from profits obtained through farming without recourse to equity. Therefore, both the inadequate availability of credit and a high rate of borrowing would stop those who do not have enough savings from getting the land (Deininger, 1999). Carter and Mesbah (1993) aver that, given uneven access to credit between the well-off and the poor, unregulated activity in the land markets tends to result in ever greater concentration of land holdings in favour of those who are already well-off.

Besides recognisable class differences, El-Ghomeny (2001) questions if landless labourers depending on wages can ever independently buy land in their lifetime and also worries about how long they would save their daily wages for them to be able to purchase land in the open market. He points out that experiential evidence shows people in rural areas have very little chances to purchase land using the market owing to (1) the downward trend in cropland availability per working person in agriculture; (2) overstated land prices; (3) the increasing need for; and (4) the unfeasibility of obtaining loans and the ridiculously high risk of lending money to the landless workers as well as poor peasants. All these dynamics underwrite to a limited ability to obtain land.

Even so, from the 1980s, some influential individuals and institutions started to advocate for 'market-based' or 'market-assisted' land reform, which has become in recent decades the most common mode of conducting land reform around the world owing to pressure on governments by 'global markets' (EL-Ghonemy, 2001). According to Karumbidza (2009), the World Bank and the International Monetary Fund have played an enormous role in promoting market-led land reform, according to which the poor are assisted to acquire properties through the land market-led. The state's role is to provide the former owner with compensation at a market or near-market value on behalf of a poor beneficiary.

Although market-based land reform aims to provide land to the poor, it has battled to meet its targets (Lahiff, 2007). Karumbidza (2009) notes that the slow impact of market-led land reforms often results in radical campaigns for land reform. Even though the land reform objectives are facilitated by the values of social justice and basic needs rather than market forces, the market value remains as a basis for paying owners for their properties because in a scenario of voluntary exchange the owner will accept no less (Aliber and Mokoena, 2002). Mngxitama (2003) states that the

Apartheid markets were never free, therefore, the market idea is not an appropriate means for seeking to remedy current land inequalities.

South Africa's approach to redistributive land reform is firmly within this recent tradition of 'market-based' or 'market-assisted' land reform. The *White Paper* on South African Land Policy states that, "the reality is that the poor and the landless are not in a position to acquire land at market prices without assistance from the state. This is because the market price of land usually includes a premium, over and above the capitalised value of agricultural profits. Poor farmers will therefore not be able to repay loans out of farm profits and will need financial assistance from the state in addition to, or instead of, credit" (DLA, 1997:17). Central to the South African approach is the voluntary acquisition of land, but also important have been the methods of beneficiary selection, of farm planning and of post-settlement support, all of which have been influenced by the market-led approach and serve to discriminate against the very poor (Lahiff, 2007).

2.5.1 The willing buyer / willing seller controversy

According to the *White Paper on South African Land Policy*:

"In formulating its land reform policy, government has endeavoured to take account of the widely conflicting demands of the various stakeholders and the implications of any specific course of action on the land market and investment in South Africa. The government is committed to a land reform programme that will take place on a willing buyer / willing seller basis. Rather than become directly involved in land purchase for the land redistribution programme, government will provide grants and services to assist the needy with the purchase of land". (DLA, 1997: 9)

Given that this passage appeared in a general section of the *White Paper* rather than in a section on land redistribution, it is implied that the willing buyer / willing seller approach was meant to be the approach for both redistribution and restitution. While the government certainly followed through on its intention to employ the willing buyer / willing seller approach, it is not the case that government avoided becoming directly involved in land purchases. For both redistribution and restitution, government officials are directly involved in transactions at multiple points, not least payment to sellers. With the transition from LRAD to PLAS as the main vehicle for redistribution, the role

of the government expanded; whereas in LRAD prospective beneficiaries were expected to identify available land and even secure offers for sale from land owners, under PLAS these responsibilities rest mainly with government officials.

Observers have faulted the use of the willing buyer / willing seller approach on various grounds. Lahiff (2007) regards the willing buyer / willing seller method as problematic because it makes land reform conditional on the willingness of the seller to sell at the prices that grant applicants can afford. Ntsebeza (2007) claimed that, in as much as South Africa's land market is active, during the LRAD era it was difficult for would-be beneficiaries to acquire land as the market price of land was high relative to what they could afford with the LRAD grant; as indicated above, such was even more so the case during the SLAG-based era of redistribution.

At the 2005 Land Summit, the commission that addressed land redistribution stated that a "Consensus on rejection of willing buyer / willing seller (except AgriSA)", while the overall Summit report accounted that, "The overwhelming majority of participants in the Summit rejected the notion that the land reform process should be based solely on the notion of willing buyer / willing seller" (Anonymous, 2005). Karumbidza (2009) argues that the condemnation of the willing buyer / willing seller approach is principally based on the concern that it is liable for the slow pace of land reform.

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In 1994, the Reconstruction and Development programme promised to redistribute 30% of the agricultural land in the first five years of democracy (Hendricks and Lucey 2013). Nearly twenty years after the promise was made, the target of transferring 30% of farmland had not been met. Hendricks and Lucey (2013) noted that it is quite clear that the democratic government needs a substantial revision of the willing buyer / willing seller programme.

Various reasons have been offered for the slow pace of land reform. The most common explanation is the interpretation of Section 25 of the Constitution. Ntsebeza asserted that there are two existing views:

"On the one hand, there are those who argue that the fundamentals in terms of policy are in place. These commentators would argue that what is now missing is commitment from the government to ensure that the policies are implemented. This allegation is often couched in terms of a lack of political will on the part of the ANC-led government. Other analysts, on the other hand,

would argue that the problem is with policy, in particular the entrenchment of the property clause in the Constitution as well as the endorsement in policy of the willing-buyer-willing-seller principle". (Ntsebeza, 2007: 76)

Much of the concern expressed about the willing buyer / willing seller approach takes a macro view, whereby the high cost of land in the market depletes limited land acquisition budgets, which in turn implies slow land reform.

However, other perspectives have also been shared regarding the limitations of the willing buyer / willing seller approach. Some of these were voiced at public hearings organised in 2003 by the Trust for Community Outreach and Education (TCOE). One hopeful land buyer from North West province testified that on more than one occasion she paid a deposit in order to acquire a farm, only to be informed that the sale had been cancelled:

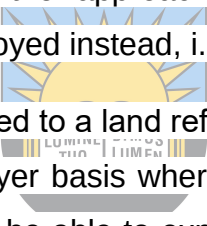
"...white commercial farmers in the district urged for withdrawal of the sale as soon as they realised that an African woman had successfully bid for the sale. Investigations undertaken by the local municipality and a legal team revealed that the owner of a farm decided to withdraw the farm. The farm was later sold to 'someone else'". (TCOE 2003: 93-94)

Another important example is Tilley's research in the Northern Cape and Western Cape, on the basis of which she argued that the market-based approach to land reform assumes an idealised version of the land market that does not reflect the realities of landless people seeking land (Tilley, 2008). One problem she noted is that, even in an area characterised by high levels of land market activity, "land availability and level of activity was not even across all registration divisions or within a single registration division" (Tilley, 2008: 84). Further, Tilley found that, while there was a large pool of 'willing buyers' in the form of prospective land reform beneficiaries, the pool of 'willing sellers' who were prepared to sell land through the land market for land reform purposes was limited. The reasons for this are multiple but at base were due to the socially embedded nature of land transactions and the unequal social relations in the countryside, which are perpetuated by a range of perceptions, many of which are based on prejudice. The owners and estate agents were more open about sharing information about available land if it was the type of land that was not highly sought after or was located in an area that was 'undesirable' for whatever reason".

Berrisford et al. (2008:7) stated that the Muldersdrift Heritage Trust Fund (MHTF) in Gauteng Province made a successful initial offer to buy land in 1997. In particular, they signed a purchase contract in March of that year with the proprietor of Portion 120 Rietfontein, an 8.5-hectare smallholding in Muldersdrift. Additionally, the deed of sale was finalised. But while the parties were negotiating the terms of payment, the sale was suddenly called off. This resulted from a counter-offer made by several nearby landowners to buy the land. Regrettably, this was the start of MHTF's protracted struggle with the "Not In My Backyard" (NIMBY) phenomenon.

2.5.2 Alternatives to the willing buyer / willing seller?

According to Lahiff (2007), the failure of the willing buyer / willing seller approach resulted in government seeking to find other ways to redistribute land. In fact, notwithstanding its clear endorsement of the willing buyer / willing seller approach, the *White Paper* acknowledges that the approach may have limits beyond which alternatives might need to be employed instead, i.e. expropriation:


 "The government is committed to a land reform programme that will take place on a willing-seller willing-buyer basis where possible. However, where this is not possible, the state must be able to expropriate land required in the public interest." (DLA, 1997: 39-40)

From at least as early as 2005, political leaders have made of point of acknowledging concerns about the willing buyer / willing seller approach. Notably, for instance, in her opening speech at the 2005 National Land Summit, the then Minister of Agriculture and Land Affairs, Thoko Didiza, "declared that the 'willing buyer, willing seller' principle underpinning the current market-based approach was a key impediment to improving the pace of land reform and would need to be reviewed" (Hall, 2005: 621). Which is not to say that anything changed in terms of how the state pursued redistributive land reform, apart from a small number of attempted expropriations.

In 2009, Gugile Nkwinti became the Minister of Rural Development and Land Reform, after which he sought to contain the negative effects of the willing buyer / willing seller approach by means focusing on the quality and nature of land valuations. The policy approach was mooted in "A Policy Framework for Land Acquisition and Land Valuation in a Land Reform Context and for the Establishment of the Office of the Valuer-

General” (DRDLR, 2012), resulting eventually in the enactment by Parliament of the Property Valuation Act, Act No. 17 of 2014, and the creation of the ‘OVG’. According to the Policy Framework, “The primary purpose for the Office is to create norms and standards for the determination of *just and equitable compensation* for land acquired for land reform and in the public interest, and to ensure their enforcement” (DRDLR, 2012: 22; author’s emphasis). This is a reference to section 25(3) of the Constitution’s ‘Property Clause’, which seeks to identify the factors which the State should take into account when determining the amount of compensation paid to an expropriatee: “The amount of the compensation and the time and manner of payment must be just and equitable, reflecting an equitable balance between the public interest and the interests of those affected, having regard to all relevant circumstances....”, such as the purpose of the expropriation, the current use of the property, the history of its acquisition, etc. (Constitution of the Republic of South Africa, §25(3)). The attempt to insert a principle that the Constitution introduced in relation to expropriation into the willing buyer / willing seller context is curious, which is not to say efficacious. While ensuring high-quality valuations was no doubt a sensible move, it is not clear that the OVG was able to go beyond that, i.e. to ensure that prices paid for land reform land were lower by virtue of taking any of the “relevant circumstances” listed in 25(3) into account. On the contrary, as will be shown later in this dissertation, there are suggestions that the manner in which Minister Nkwinti chose to pursue land redistribution were particularly expensive.

Notwithstanding public gestures to the contrary, in effect government’s approach to redistributive land reform never reduced in any meaningful way its reliance on the willing buyer / willing seller approach. Disenchantment with the approach eventually manifested in public calls by the Economic Freedom Fighters (EFF), a political party, for “Land expropriation without compensation”. On the 27th of February 2018, the EFF moved a motion in the National Assembly to expropriate land without compensation (Ncube, 2021). Ncube asserted that, “On the 20th of December 2017, at the end of the 54th Conference of the ANC, the party resolved to pursue as ‘a matter of policy’ the expropriation of land without compensation” (Ncube, 2021: 54).

2.6 CONCLUSION TO THE CHAPTER

In a nutshell, South African government started land reform programmes such as the Land Reform for Agricultural Development (LRAD) programme and Municipal Commonage Programme and their supplementary financial support packages in the form of LRAD grants (previously SLAG) and grants to municipalities to gain extra commonage. Although hailed for this move, most scholars argue that the previously disadvantaged still do not afford to purchase enough farmland to be used for commercial purposes. The aim of transferring 30% of the country's land to be owned by black people was never achieved as most of farmlands is still under white commercial farmers who presently dominate the Agricultural sector.



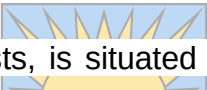
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CHAPTER THREE: RESEARCH METHODOLOGY

3.1 INTRODUCTION

The purpose of this chapter is to outline the methodology employed in this study. The study will employ fixed effects panel regression to estimate the impact of land reform on farmland prices and descriptive statistics to analyse trends over time. The research methodology and approach are outlined at the beginning of the chapter, and then the conceptual framework and dataset are explained. Additionally, it explains the statistical methods used to examine the data, such as fixed effects panel regression and descriptive statistics. Lastly, the research acknowledges the research ethics for using secondary data.

3.2 DESCRIPTION OF THE STUDY AREA



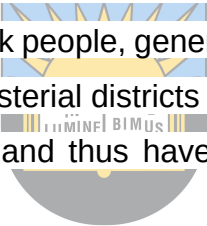
South Africa, as the name suggests, is situated in the southern end of the African continent. It is surrounded by Botswana, Mozambique, Namibia, and Zimbabwe on its northern borders, whereas the Atlantic Ocean and the Indian Ocean cover the west and east flanks, respectively (see Figure 3.1). The South Africa Yearbook notes that South Africa's surface area is about 1.2 million square kilometres (SAYearbook, 2016: 1), or 120 million hectares. Of this, approximately 82 million hectares were regarded as agricultural as of 1996 (Byamugisha, 2014:2).

South Africa is comprised of nine provinces which in turn are subdivided into 8 metropolitan municipalities and 44 district municipalities, the latter of which are further subdivided into 226 local municipalities (Statistics South Africa, 2018). However, historically, land administration has made use of other geographical units, in particular magisterial districts, which feature for example in farm property designations as captured by the Surveyor General's Office of the Registrar of Deeds. Van Rooyen and Naidoo (2006: 458-459) explain the broader significance of magisterial districts:

“...it must be noted that the boundaries of the nine provinces of South Africa were established in terms of the Constitution of the Republic of South Africa, 1993. Schedule 1 of that Constitution defined the areas of the different provinces by specific reference to magisterial districts that were created in

terms of the Magistrates' Courts Act, 1944 (Act No. 32 of 1944). In most cases an entire magisterial district was incorporated into a particular province, although in certain instances, portions of one magisterial district were incorporated into one province and other portions thereof were incorporated into another province. The outer boundaries of these clustered magisterial districts then formed the boundary of a province, and by implication, meant that provincial boundaries were based on the boundaries of magisterial districts, rather than by reference to municipal boundaries."

The map below shows the composition of South Africa by province, but also shows the position of the former homelands. With some exceptions, former homeland areas were and remain devoid of properties held in terms of private freehold tenure, and therefore were and remain devoid of formal property transactions, meaning those recorded in the Deeds Registry. By the same token, for the most part former homeland areas are not the focus of redistributive land reform, a key aim of which is to expand the amount of land available to black people, generally entailing acquiring it from white farmers. As it happens, some magisterial districts fall entirely within a former homeland area (e.g., Tsolo, Engcobo, etc.), and thus have been not included in the present analysis.

The logo of the University of Fort Hare is a circular emblem. It features a stylized sun or starburst at the top, followed by a series of horizontal bars in blue, yellow, and grey. Below these bars, the words "UNIVERSITY OF FORT HARE" are written in a serif font. The entire emblem is set against a dark grey background.

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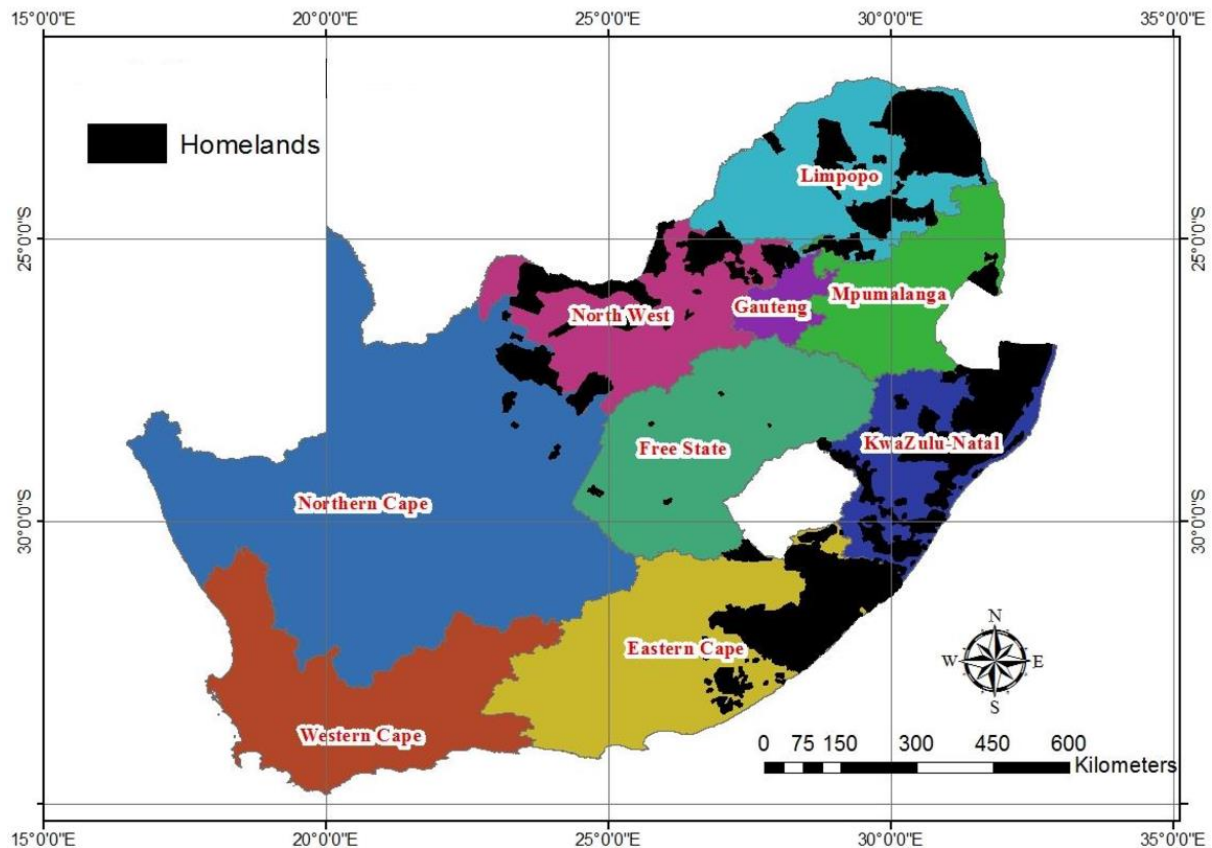


Figure 3.1: Map showing the study area, South Africa

Source: Google maps (2017)

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The table below shows the distribution of commercial farmland by province on the eve of democracy. It also shows the cumulative restitution and redistribution delivery up to 2017/18, and further shows the share of commercial farmland as of 1993, that has since been transferred or made available via the government's land reform programme. (The reason for saying 'transferred or made available' is that, as explained above, when land is acquired for redistribution in terms of the Proactive Land Acquisition Strategy, it is not actually transferred to beneficiaries, but rather leased to them.) A striking feature of the table is that it reveals the enormous variation between provinces as to the extent of land reform, from a low of 4.3% in the Free State, to a high of 35.5% for KwaZulu-Natal.

Table 3.1: Summary of commercial farming units and farmland area by province, various years

Province	Number of commercial farming units as of 1993*	Commercial farmland by hectares as of 1993*	Hectares of land transferred / made available via land reform as of 2017/18**		Land reform as share of 1993 commercial farming area
			Restitution	Redistribution	
South Africa	57 980	82 759 302	3 495 155	4 882 978	10.1%
Western Cape	8 352	10 249 665	11 042	555 964	5.5%
Eastern Cape	6 106	10 319 563	127 699	544 754	6.5%
Free State	10 252	11 321 192	58 104	424 912	4.3%
Gauteng	2 500	674 894	17 443	61 417	11.7%
KwaZulu-Natal	6 080	4 064 032	847 912	596 518	35.5%
Limpopo	5 053	5 335 289	706 423	17 892	16.6%
Mpumalanga	5 406	4 648 309	523 735	482 651	21.7%
North West	7 638	6 184 009	701 014	499 830	19.4%
Northern Cape	6 593	29 962 349	501 783	1 538 003	6.8%

Sources: * Central Statistical Services, 1998; **DPME, 2021.



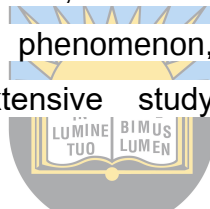
3.3 RESEARCH APPROACH AND METHODS

There are various ways to describe and categorise a research endeavour, with little consensus among academics as to key terms such as ‘research approach’, ‘research design’, and so on, even within the social sciences. For instance, Sahu categorises research designs as either “exploratory”, “descriptive,” or “hypothesis-testing” types (Sahu, 2013: 26-27), whereas Creswell distinguishes between qualitative, quantitative and mixed methods research designs (Creswell, 2009: 3), and Adams et al. distinguish between experimental design, quasi-experimental design, and “non-experimental or observational design” (Adams et al., 2007: 82). As Hofler observed some decades ago, terms such as research approach, method and technique, “...seem to be used arbitrarily, indiscriminately or synonymously by various authors” (Hofler, 1983: 71).

For purposes of the present study, we describe the approach as within the post-positivist paradigm, in that it proceeds by means of “combining empirical observations with logical reasoning” in order to draw probabilistic conclusions regarding the researcher’s research questions (Bhattacharjee, 2012: 21). Furthermore, the present study can be characterised as ‘descriptive research’; Leedy and Ormrod (2015) define

descriptive research as a type of research that entails either the identification of the characteristics of a phenomenon under observation or the exploration of phenomena; descriptive research is whereby data are gathered without manipulating the environment. Leedy and Ormrod further state that, “This general category of research designs involves either identifying the characteristics of an observed phenomenon or exploring possible associations among two or more phenomena.” (Leedy and Ormrod, 2015: 154). This last point is important to bear in mind for the present exercise, which involves identifying statistical relationships which are sometimes interpreted as cause-and-effect relationships, even though strictly speaking the methods employed here do not prove causality. However, it is also important to state that the present exercise is largely ‘exploratory’ in nature:

“Exploratory research is often conducted in new areas of inquiry, where the goals of the research are: (1) to scope out the magnitude or extent of a particular phenomenon, problem, or behavior, (2) to generate some initial ideas (or “hunches”) about that phenomenon, or (3) to test the feasibility of undertaking a more extensive study regarding that phenomenon.” (Bhattacharjee, 2012: 5)



For the case at hand, it is indeed the case that there are few studies to which the researcher is able to refer on the topic of the relationship of the land market to land reform. The nature of the research undertaken is very much in the spirit of exploration, starting from an examination of descriptive statistics at different geographical levels, and proceeding to econometric analysis in which the possible influence of land reform is modelled in a number of different ways, owing to the fact that there is little to go on from previous literature as to what aspect of land reform, if any, might exert an influence on the land market.

The specific research methods employed in the study include the analysis of secondary data by means of descriptive and inferential statistics, where the latter include t-tests for different means and econometric analysis of panel data, about which more is said later in this chapter.

As explained in section 1.5 above on delimitations, it is acknowledged that this does not represent all of the useful ways in which one could seek to understand the interface between the land reform programme and the land market. In particular, the research

does not involve a qualitative inquiry into the perspectives of land owners, or into what happens when prospective beneficiaries or government staff approach owners; the researcher attempts to compensate for this shortcoming by means of contextualising her research findings in relation to the relevant existing qualitative literature on the workings of farmland dynamics in South Africa.

3.4 CONCEPTUAL FRAMEWORK

The conceptual framework for the present study is that commercial farmland is a productive asset whose market value is influenced by a variety of factors both intrinsic and extrinsic to its productive value. Thus, the framework is in keeping with what one might call the 'expanded net present value model' of Mela et al. (2016) and Devadoss and Manchu (2007), which in turn closely resembles the hedonic pricing approach of Ghidoni et al. (2016).

For the particular case of commercial farmland in South Africa, the influences on market value can be thought of as: i) those that affect its productive value; ii) those that affect its market value apart from productive value; and iii) land reform, the effect of which is a priori ambiguous. As per the literature (see e.g., section 2.4.3), influences on land value other than productive value would include the population density, interest rates and the vibrancy of the nearby housing market.

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For land reform, one can speculate two distinct, and in fact countervailing, possibilities. First, to the extent land reform represents an exogenous increase in land demand, one would expect it to exert an upward pressure on farmland prices. Second, one might suppose the possibility of a 'NIMBY effect' associated with an influx of black neighbours arriving by means of land reform. While there are no instances of this in the literature on land reform, there is ample literature empirically linking the influx of black residents into erstwhile, white-dominated neighborhoods with negative impacts on urban housing prices (Hsieh and Moretti, 2015; Kim, 2000; Schively, 2007; and Berrisford et al., 2008).

The interest rate pertaining to this study is the prime rate, which is the interest rate charged by commercial banks to their prime creditworthy customers. Obi (2006) claims that the interest rate is a fundamental macro-price determining accessibility to farm loans. This means that the interest rate is the main determinant of how much credit

prospective farm investors can attain to buy land and additional farm inputs. According to Ziqubu (2009), interest rates are expected to have a direct impact on farmland prices, i.e. as interest rate increases, the cost of debt also increases, thus making land acquisition more expensive.

The value of a piece of land is associated with the output it can produce. The land is priced according to expected yield, i.e. more productive land results in higher cash rent and, therefore, higher land values (Gibson, 2013). There is a high demand for land in South Africa every year and that tends to increase farmland prices. However, the ‘NIMBY effect’ (‘not in my backyard’) which is mostly known as the “white flight” could have the effect of pushing prices down.

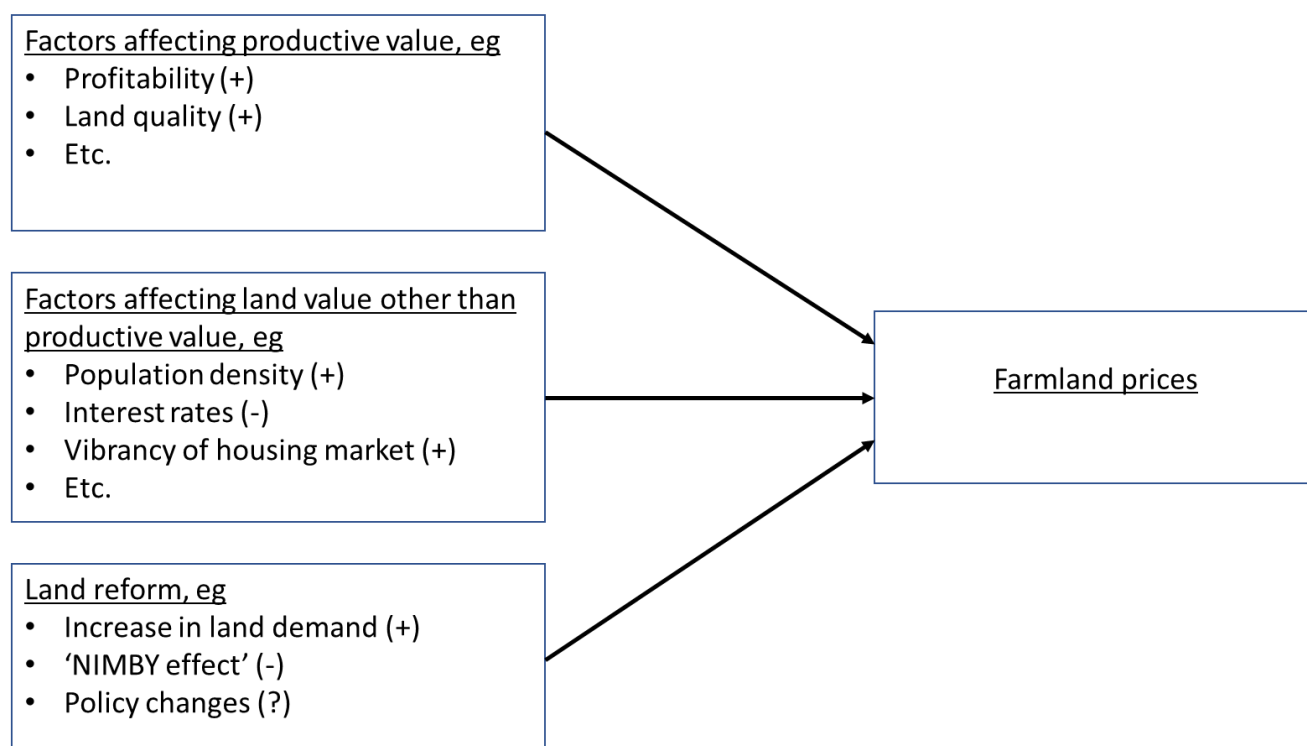


Figure 3.2: Conceptual framework

3.5 DATA ANALYSIS

The table below summarises the approaches that were used for analysing the data, according to the specific objective.

Table 3.2: Framework of data analysis

Research objectives	Analytical tools
To examine the trends over time of agricultural land prices and market volumes.	• Descriptive statistics ○ Trends in avg land prices over time; RSA and by province ○ Trends is number of transactions over time; RSA and by province ○ Trends in hectareage transacted over time; RSA and by province • Paired two-sample t-test
To determine the trends over time in prices paid and hectares acquired by the land reform programme.	• Descriptive statistics ○ Trends in avg LR land prices over time; RSA, by province, and by selected districts ○ Trends is number of LR transactions over time; RSA and by province ○ Trends in LR hectareage transacted over time; RSA, by province, and by selected districts
To explore influence of the land reform programme on farmland market price	• Fixed effects and Random effects panel regressions (see below)

3.5.1 Descriptive statistics

The first two specific objectives make ample use of descriptive statistics: “Descriptive statistics are used to describe and summarize data and ... have an important role to play, enabling data to be explored before any further analysis is undertaken but also as a primary means of describing how things are rather than seeking to explain why phenomena occur” (Lewin, 2005: 215). For the purpose at hand, the descriptive statistics mainly take the form of trendlines, the purpose of which is to discern patterns of change over time of phenomena such as average farmland prices, number of farmland transactions, area transacted, etc. While on their own descriptive statistics do not enable one to draw conclusions regarding, say, statistical associations or

causal relationships, they are nonetheless a useful start to understanding the nature of the South African land market, and the place of land reform in relation to it. This understanding emerges in part by way of comparisons of farmland prices to other phenomena with which these prices are expected to have a relationship, such as farm income and interest rates (see Conceptual Framework above), but also by means of comparing farmland prices to housing prices, and more importantly to prices paid for farmland in the market versus prices paid by the land reform programme.

In order to draw more insight from descriptive statistics, the dissertation focuses on a handful of districts selected on the basis that they have experienced unusually high levels of land reform. The premise is that, if indeed land reform does have, say, an impact on farmland market prices, one would expect to observe it in areas where land reform has been concentrated. The researcher selected four districts which were chosen based on their remarkably high levels of land reform programme. The names of the chosen district are as follows; Helpmekaar-uMzinyathi district, which is situated in KwaZulu-Natal, the second district is Mahikeng which is in the central part of North West, the third district of interest is Barkly-Wes, which is in the Northern Cape and the final district inspected is Komga, which is located in the Eastern Cape province.

3.5.2 Paired two-sample t-test for different means

Before proceeding to the econometric analysis, the researcher took advantage of the fact that the data lend themselves to a simple inferential test, namely the paired two-sample t-test for different means. The test was applied in order to see whether the average price per hectare of land in the farmland market differs from the average price of land acquired via the redistribution programme versus the restitution programme. The test was applied nationally and for each province, where the data points were the annual average price per hectare values. The paired version of the t-test was used in the sense that, say, the average price for redistribution land in the Eastern Cape in 2015 was compared to the average market price for farmland in the Eastern Cape, also for 2015.

The formula for the test is as follows: $t = \frac{\bar{x}_{diff}}{s_{\bar{x}}}$ and $s_{\bar{x}} = \frac{s_{diff}}{\sqrt{n}}$, where $\bar{x}_{diff}$ is the mean difference between the observations, $s_{\bar{x}}$ is the standard deviation of the mean difference, s_{diff} is the standard deviation of the differences, and n is the sample size.

Thereafter, one compares one's t statistics to a critical value from a t -table, and calculates the associated 'p-value', i.e. the probability that one is incorrect in rejecting the null hypothesis of no difference (Piegorisch, 2002).

3.5.3 Econometric modelling

3.5.3.1 Introduction

The econometric modelling undertaken as part of this research is based on the enhanced net present value approach, after Mela et al. (2016) and Devadoss and Manchu (2007), as described in Chapter Two. As with the hedonic pricing approach which is not very different (see e.g., Ghidoni et al., 2016), this approach does not dictate a particular functional form, however it does necessitate certain explanatory variables, which will be described below.

Nor does the net present value approach require a particular kind of data. For the case at hand, panel data are available – meaning data that possess both cross-sectional and time-series dimensions – which offer various advantages. Biørn (2017) stated that 'panel data' refers to a dataset that comprises of repeated observations on a subset of variables from a group of observational units over two or more time periods. In simple terms, panel data is a dataset in which the behaviour of things are observed over time. This study utilises panel data because in terms of understanding the relationship between land reform and the land market, variation over both time and space are likely to be important. Gujarati and Porter (2009: 592-593), have stated some of these advantages of panel data:

“Panel data can better detect and measure effects that simply cannot be observed in pure cross-section or pure time series data. For example, larger sample size, control of unobserved heterogeneity of cross-sectional units. Panel data gives more informative data, more variability, less collinearity among variables, more degrees of freedom and more efficiency.”

The study explores the use of the two models most commonly used with panel data, namely the fixed effects model and the random effects model, while also testing which of these is the more appropriate.

3.5.3.2 Model specification

Allen (2004) defines model specification as the method of deciding which independent variables and dependent variables to include and to exclude from a regression model. Allen further describes a multiple regression model as a theoretical statement regarding the relationship between one or more independent variables and one or more dependent variables, inclusive of the mathematical nature of that relationship, commonly referred to in econometrics as the ‘functional form’.

The basic model for this study shall be as follows:

$$APPH = f(AGVA, INT, RED, REST)$$

where:

$APPH_{it}$ is the dependent variable, which is the average price per hectare of farmland in province/district i in year t ,

$AGVA_{it}$ is the agricultural gross value added in province/district i and year t ,

$RIRATE_t$ is the real interest rate in year t .

$REDS_{it}$ and $RESTS_{it}$ are variously the numbers/hectarages/values of redistribution and restitution projects, respectively, in province/district i in year t (to be defined in greater detail in due course).

3.5.4.1 Fixed effects model

A fixed effects model is a statistical model used in econometrics and other fields for analysing panel data or longitudinal data in which numerous entities are observed over time. In a fixed effects model, the focus is on the variation within each entity or subject rather than the variation across entities (Bell and Jones, 2015). According to Anna and Angelo (2014), it takes into consideration individual- or entity-specific traits that do not vary over time but can have an impact on the dependent variable. The model controls for the unobserved heterogeneity across entities. Allison stated that, “In the classic view, a fixed effects model treats unobserved differences between individuals as a set of fixed parameters that can either be directly estimated, or partialled out of the estimating equations” (Allison, 2009: 2).

The model used in the analysis was initially as follows:

$$\begin{aligned} \text{Apphmakt}_{it} = & \beta_0_i + \beta_1 \cdot \text{AVAPH}_{it} + \beta_2 \cdot \text{RIRATE}_t + \beta_3 \cdot \text{PopDens}_{it} + \\ & \beta_4 \cdot \text{TransRestn}_{it} + \beta_5 \cdot \text{TransRestn}_{it-1} + \beta_6 \cdot \text{TransNonPLAS}_{it} \\ & + \beta_7 \cdot \text{TransNonPLAS}_{it-1} + \beta_8 \cdot \text{TransPLAS}_{it} + \\ & \beta_9 \cdot \text{TransPLAS}_{it-1} + \varepsilon_{it} \end{aligned}$$

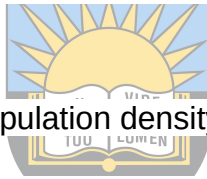
where:

Apphmakt_{it} is the dependent variable, which is the average price per hectare of farmland in province/district i in year t , in 2010 constant Rand,

β_0_i are the entity-specific intercepts ('fixed effects'), per province/district,

AVAPH_{it} is the agricultural gross value added per hectare in province/district i and year t , in 2010 constant Rand,

RIRATE_t is the real interest rate based on the prime rate, in year t ,



PopDens_{it} it is the population density in province/district i and year t ,

TransRestn_{it} and TransRestn_{it-1} are the numbers of land restitution transactions in province/district i , in years t and $t-1$, respectively,

TransNonPLAS_{it} and $\text{TransNonPLAS}_{it-1}$ are the numbers of land redistribution transactions other than PLAS, in province/district i , in years t and $t-1$, respectively,

TransPLAS_{it} and TransPLAS_{it-1} are the numbers of PLAS-based redistribution transactions in province/district i , in years t and $t-1$, respectively,

β_1 through β_9 are the slope coefficients on the above-mentioned explanatory variables, and

ε_{it} is the error term.

The functional form of the model was somewhat amended in light of post-regression diagnostics which indicated that the original assumption of linearity in the variables was not warranted.

3.5.4.2 Random effects model

The random effects model is justified by the fact that, unlike the fixed effects model, variation between entities is believed to be random and uncorrelated with the predictor or independent variables included in the model (Anna and Angelo, 2014). Anna and Angelo noted that one advantage of random effects is that time invariant variables (such as gender) can be included. “The crucial distinction between fixed and random effects is whether the unobserved individual effect embodies elements that are correlated with the regressors in the model, not whether these effects are stochastic or not” (Green, 2008:183). In a random effects model, the variability between different entities or groups is treated as random. The random effects model differs from the fixed effects model in that entity-specific, time-invariant effects are included in an error term component (Blanc and Schlenker, 2017). The random effects model tested in this study was as follows:

$$\text{Apphmakt}_{it} = \beta_0 + \beta_1 \cdot \text{AVAPH}_{it} + \beta_2 \cdot \text{RIRATE}_t + \beta_3 \cdot \text{PopDens}_{it} + \beta_4 \cdot \text{TransRestn}_{it} + \beta_5 \cdot \text{TransRestn}_{it-1} + \beta_6 \cdot \text{TransNonPLAS}_{it} + \beta_7 \cdot \text{TransNonPLAS}_{it-1} + \beta_8 \cdot \text{TransPLAS}_{it} + \beta_9 \cdot \text{TransPLAS}_{it-1} + \varepsilon_{it} + \omega_i.$$

where the variables are defined as above for the fixed effects model, except that:

β_0 is the intercept,

ε_{it} is the (usual) error term, and

ω_i is the entity-specific error term.

3.5.4.3 Fixed Effect, Random Effects, and unbalanced panel data

When discussing panel data, one distinguishes between balanced and unbalanced panels. A balanced panel is one in which there is an observation for each cross-sectional unit in each time period, whereas an unbalanced panel is one in which for one or more cross-sectional units there are missing values for a one or more (but not all) years.

As will be explained in more detail below, this study uses two panel datasets, for which the first has provinces as the cross-sectional units, and the other has districts as the cross-sectional units. The province-based dataset is fully balanced, whereas the district-based dataset is a slightly unbalanced panel. In the present circumstances, the main reason this is the case is not because of non-available or lost data, but because not all districts have land transactions in all years. In such instances, the average price per hectare of marketed land is not zero, but non-existent; of course, land in an area has a market value in year t even if none has been transacted in that year, but we do not know what it is. (In principle, one could interpolate these values based on previous and subsequent values based on transactions that are observed, but in practice this was not done.) Out of the 736 total possible observations one would have for a balanced panel of 16 years' worth of observations for all 46 districts, there were only 6 district-years in which there were no recorded farmland transactions, and thus no known price, meaning that the actual panel falls short of a perfectly balanced one by 0.82%.



Apart from non-occurring land transactions, another reason for the panel to be unbalanced applies to those district regressions ('Models 7 and 8') in which one of the explanatory variables is the ratio of land reform hectares to private transaction hectares. This variable is undefined in those cases where there was no private land transaction, i.e. because one cannot divide by zero. Because this variable also had a lag, it resulted in a further reduction in the number of useable observations.

Standard methods, such as fixed effects, can often be applied to produce consistent estimators, and most software packages that have built-in panel data routines typically accommodate unbalanced panels. However, determining whether applying standard methods to the unbalanced panel produces consistent estimators requires knowing something about the mechanism generating the missing data. The main concern discussed in the literature is where the panel experiences 'attrition', whereby for example some respondents who participated in early waves of the panel are no longer available for later waves (Baltagi and Song, 2006). In other words, the underlying concern regarding unbalanced panels is that their lack of balance might reflect a form of sample selection bias, i.e. endogenous selection: "This means that the selection of observation units in different periods is entirely or partly determined by variables we want to explain, which ... may give rise to inconsistent coefficient estimates and biased

test procedures if they are not given due attention” (Biørn, 2017: 288). For purposes of this study, the question is, is the absence of a land market transaction in a particular year and district ‘determined by variables we want to explain’? To the extent this may be the case, it is not in any straightforward manner. As indicated above, the variable this research is seeking to explain is the average market price of farmland in an area in a given year; to the extent market transactions may not happen in a given district in a particular year, it is overwhelmingly because there are relatively few tradable land parcels to begin with, as in the case of Mthatha. Outside of Mthatha, the instances of absent transactions are too episodic and scattered to suggest anything like an endogeneity problem.

Biørn indicates that, in the absence of an endogenous selection problem, there are various options one might consider. One of these is to force the panel to balance by excluding either cross-sectional units, or periods, or both. For example, one could remove Mthatha District from the dataset altogether, as well as the other 13 districts in which there is at least one year in which there were no farmland transactions. Doing so would of course reduce the number of observations, which would be at the cost of consistency. A second possibility mentioned by Biørn is to impute the missing values, however in the current circumstances, any imputation method would be difficult to defend. And third, the panel models could be modified to accommodate the reality of an unbalanced panel, which is what is done here. The main concern is with estimation of the variance of the error term associated with the cross-sectional units in the random effects model, i.e. the ω ’s (Biørn, (2017). For a balanced panel, this is normally estimated as follows:

$$\hat{\sigma}_{\omega}^2 = s_e^2 - \hat{\sigma}_u^2 T,$$

where $\hat{\sigma}_{\omega}^2$ is the estimate of the variance of the error term for the cross-sectional unit, s_e^2 is the residual variance from the ‘between regression’, $\hat{\sigma}_u^2$ is the estimated variance of the ‘normal’ error term from the random effects model, and T is the number of time periods making up the time dimension of the panel. The challenge with unbalanced panels is that T in fact is not a constant, rather it is more appropriate to speak of T_i ’s. For unbalanced panels, one common adjustment is to use the harmonic mean of the T_i ’s instead of T. This is the approach followed by Gretl, which is the same as that used by Stata (Cottrell and Lucchetti, 2020).

For fixed effects models, there is in effect no problem with unbalanced panels, because the time-invariant cross-sectional influence is not accommodated via an unobserved component of the error (i.e. the ω_i 's), but as observable fixed effects (i.e. the β_{0i} 's).

3.5.4.4 Diagnostic tests

Gujarati (2004:516) indicates that diagnostic testing is important in estimating an econometric model. The reasons include determining whether the conditions are met for the estimator in use to have desirable properties such as unbiasedness, efficiency and consistency. Such diagnostic tests generally involve examining the properties of the residual which gives a good indication of the properties of the unseen error terms. Another rationale for diagnostic testing is to detect what might be impeding significant results (e.g., multicollinearity), or to detect for incorrect functional form (e.g., Ramsey Reset). For purposes of this study two diagnostic tests are performed. First, the Hausman Test is usually used to select between the fixed effects and the random effects estimators for panel data. The random effects estimator assumes that there is zero correlation between the regressors and the error term, a position that should be considered the exception instead of the rule (Wooldridge, 2002a).

The Hausman Test in effect tests for a relationship between the unique errors (u_i) and the repressor's, of which the null hypothesis is that they are not correlated. This is done by first running a Fixed Effects Model and saving the estimated slope parameters and residuals, and then doing the same for the Random Effects Model. The Hausman Test statistic can then be calculated as

$$W = (\hat{\beta}_{RE} - \hat{\beta}_{FE})' \hat{\Psi}^{-1} (\hat{\beta}_{RE} - \hat{\beta}_{FE}) \sim \chi^2(k),$$

Where $\hat{\beta}_{RE} - \hat{\beta}_{FE}$ is the vector of differences between the estimated coefficients from the two estimators, and $\hat{\Psi}$ is the element-by-element difference between the covariance matrices of the estimated slope vectors. The Hausman Test is underlined by the null hypothesis that the Fixed Effects Model and Random Effects Model are not entirely different. The test statistic has an asymptotic χ^2 distribution, whereby if the null hypothesis is rejected (i.e. if W is significant) it is concluded that the Random Effects Model is not appropriate as its error terms are shown to be correlated with one or more

regressors (Lui, 2010). In practice the Hausman Test is a built-in function of most statistical software packages, which indeed is the case with Gretl.

The other diagnostic test conducted for the regressions in this study is the Q-Q plot for the normality of the residual, which in turn is the basis for hypothesis testing. The points on the Q-Q plot should mostly lie along the diagonal line if the residuals roughly resemble a normal distribution. Deviations from this line may suggest non-normality, which could jeopardize the accuracy of confidence intervals and statistical tests.

3.6 DESCRIPTION OF DATASETS AND VARIABLES USED

There are two datasets used for the analysis, the one of provincial-level data, and the other of district-level data. The data for the analysis have been synthesised from various sources of secondary data and are in the form of annual aggregates at different geographical areas, such as the total hectares transferred per province or per district municipality per year.



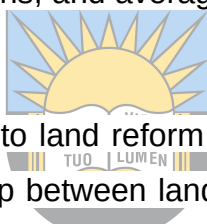
3.6.1 Land Prices

The average price per hectare of farmland is the dependent variable in the study. For a given area and year, this is defined as the total amount of money spent to acquire farmland in the market, divided by the total hectareage of the acquired land. These data were obtained from <http://land.agrids.co.za/>, which details farmland market statistics and is built on transactions data captured by the Registrar of Deeds. However, although a version of this dataset is publicly available, most of the specific data series accessed for purposes of this study were accessed by arrangement with the website's creator, Mr Johann Bornman. The data obtained were from 2002 to 2017. The data accessed from the website are in current Rand, however they were converted by the researcher into 'constant 2010 Rand' by means of using the consumer price index, accessed from Statistics South Africa. (The GDP deflator could also have been used, however the cpi and GDP deflator are virtually indistinguishable over the period in question.) The land market data was provided in the form of magisterial districts, which were then used to analyse trends in the farmland market prices. The district municipality was used for the regressions, and the magisterial district was matched

with it for the regression models that were used for the district-level and provincial-level data.

3.6.2 Redistribution and Restitution transactions, average prices, hectares transferred and transaction values

These are the main explanatory variables for the study, given the main aim of the study to investigate the connection between land reform activity and farmland market prices. For the provincial-level estimation, the data was acquired from the Department of Rural Development and Land Reform and came in the form of lists of redistribution and restitution projects, from which annual and provincial aggregates were then calculated. For the district-level estimation, the land reform data were obtained from the above-mentioned data portal, <http://land.agrids.co.za/>. For both the province-level and district-level datasets, here are the types of land data were used: area (hectares transferred), numbers of transactions, and average price per hectare and transaction values.



The explanatory variables related to land reform are varied from model to model in order to investigate the relationship between land reform activity and market prices. Specifically, three different ways are used to measure the extent of land reform in a particular year in a given province or district: number of land reform projects, the aggregate value of land reform land acquired, hectareage, and Ratio of land reform land to all transacted land. However, for the redistribution programme the data is divided into two forms i.e. “NonPlas” which includes all other redistribution programme besides “PLAS” and “PLAS” programme.

First-order lags of the land reform variables are also included so as to allow for the possibility that land reform activity in one year can influence land market conditions in the following year. The inclusion of lags is also potentially important because it may help clarify the direction of causality. Moreover, it should be noted that the purpose of these regressions is to determine the connection of land prices to other important variables, most particularly those in connection with the land reform programme. The land reform variables used in the district-level and province-level regression models are summarized in the table below.

Table 3.3: Definition of land reform variables for provincial-level and district-level regressions

Measure	Variable
Number of land reform transactions	• Transrestn • TransNonPlas • TransPlas
Value of land reform transactions	• Valrestn • ValNonPlas • ValPlas
Area of land reform transactions	• HArestrn • HANonPlas • HAPlas
Ratio of land reform land to all transacted land	• Ratio_Restn • Ratio_NonPlas • Ratio_Plas

Given the mention above of the NIMBY effect, one might wonder why no variables are included relating to the numbers of beneficiary individuals or households. Although consideration of such variables would have been desirable, unfortunately the data on hand did not allow for it. For the project-level redistribution data provided by the Department of Rural Development and Land Reform, the number of beneficiaries was absent for about 15% of all projects, while for the restitution data, beneficiary numbers were omitted for almost half of the projects.

3.6.3 Agricultural gross value added

The annual value added for the Agricultural Forestry and Fisheries sector is obtained from the Statistics South Africa for the period from 1995 to 2018, specially from the spreadsheet made available on Statistics South Africa's website that complements statistical release P0441. The series used are the ones in 2010 constant Rand, meaning Stats SA has adjusted for inflation using the GDP deflator.

In the context of this research, 'AFF value added' serves as an important control variable, in the sense that there is strong *a priori* reason to suppose that farm income influences land prices (Van Schalkwyk, 1995), and agricultural value added is a proxy for farm income.

Although they are not the same, agricultural value added and net farm income are closely related. The main reason for using agricultural value added instead of net farm income is that time series per province are readily available for agricultural value added, which is not the case for net farm income. For net farm income, one can find only a national series, which is too limiting. At national level, the Pearson correlation coefficient between net farm income and agricultural value added for agriculture, forestry and fisheries is 0.96. For purposes of this exercise, Agricultural

3.6.4 Real interest rates

Real interest rates are included in the models as another control variable, given that the cost of borrowing is recognized to have a sturdy effect on property prices, including farmland (Van Schalkwyk, 1995). The specific interest rate used for this study was the real interest rate based on the prime rate; an interest rate that commercial banks charge their 'prime' customary, defined loosely as the most creditworthy corporate customers. The real interest rates data were acquired from the World Bank website for the observed study period from 2002 to 2017.



3.6.5 Population densities

Population densities were derived from Statistics South Africa data, in particular by taking magisterial district data from the 1996 population census, and then adjusting it over time according to the urban/rural population shares for that district according to the urban and rural growth rates for the respective province.

Table 3.3: Expected signs of the coefficients

Variable	Expected sign	Explanation
Agricultural Value Added per hectare of farmland	+	Higher levels of Agricultural Gross Value Added per hectare are capitalised into land values, as reflect in farmland market prices, as per the net present value approach.
Real Interest rates	-	Higher interest rates mean the cost of debt is higher, thus effectively making land acquisition more

		expensive, in turn suppressing demand and thus prices.
Population density	+	Higher population density implies more pressure on the value of farmland for possible conversion to other uses.
Land reform, i.e. Redistribution and Restitution programme • number of land reform projects • the aggregate value of land reform land acquired. • Hectarage • Ratio of land reform land to all transacted land	+/-	The land reform programme may lead to either increase or decrease of farmland prices. For instance, the high demand of land for LR may tend to increase farmland prices, but the NIMBY effect may push land prices down.

The econometric estimation was undertaken using Gretl software.



3.7 RESEARCH ETHICS

The study used secondary data only. The data was used with integrity and the researcher took every precaution to comply with the regulations of the institution's policy on research ethics. The study acknowledges the sources of data properly and in full. The study also passed a plagiarism test.

3.8 CONCLUSION TO THE CHAPTER

In conclusion, a strong framework for examining the complex dynamics surrounding the influence of redistributive land reform on farmland prices in South Africa is provided by the methodology that was selected, which combines both descriptive analysis and a panel data model. By integrating these two analytical techniques, we hope to identify possible causal links and long-term trends in addition to describing the current situation of farmland prices after land reform programme has been implemented. Using secondary data, which draws from a wealth of historical information, guarantees a thorough and detailed analysis of the variables involved.

As we proceed to the data analysis chapter, we believe that this methodological framework will help the researcher to draw significant findings and provide insightful advice for stakeholders, policymakers, and academics who are interested in the intricate relationship that exists between farmland prices and land reform policies in the context of South Africa.



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CHAPTER FOUR: RESULTS AND ANALYSIS

4.1 INTRODUCTION

This chapter presents the findings of the study. The chapter comprises three main parts. The first part makes use of descriptive statistics in order to examine trends in the farmland market, in particular prices and hectarage. The second part examines trends in prices and volumes of land reform land, in comparison to market trends; this is done for the 9 provinces, as well as for four districts selected on the basis of relatively large amounts of land reform land transacted relative to farmland transacted in the market. The third part of the chapter comprises the econometric analysis, which in turn has two parts, namely the part based on the province-level panel data, and the part based on the district-level panel data. The purpose of the econometric modelling is to test the proposition that land reform influences farmland market prices.

4.2 AGRICULTURAL LAND PRICE AND VOLUME TRENDS

4.2.1 Aggregate national trends



Regardless of whether and how land reform may affect land prices, there is no doubt that high land prices can be an impediment to a land reform programme in which land is acquired through the market, as is virtually always the case in South Africa. As stated by a policy document of the then Department of Rural Development and Land Reform: “The willing-buyer willing-seller approach to land acquisition, the central pillar of a compensation regime based on market value, has been severely criticised by a number of stakeholders as responsible for the high land prices paid by government, thereby standing in the way of faster land reform” (DRDLR, 2012: 12).

Figure 4.1 presents the national trends of nominal and real average farmland prices in terms of the average price per hectare, for the period 2002-2017, using 2002 as the base year for the real price trend. Up to 2006, farmland prices were increasing at a decreasing rate, but between 2006 and 2009 prices increased significantly. However, from 2009 to 2011, farmland prices declined modestly in both real and nominal terms, likely as a result of the lingering economic effects of the 2008/2009 global financial crisis. Taken as a whole, the period 2009 to 2017 saw an overall real increase in land prices of 3%, or only about 0.4% per year. Relative to the period 2002 to 2009, over

which real annualised price increases were on average 21% per year, real price increase since 2009 were minimal. The reasons for this could be numerous, starting with South Africa's generally lacklustre economic performance over the period, and perhaps the eruption of the public debate towards the end of the period on 'land expropriation without compensation'.

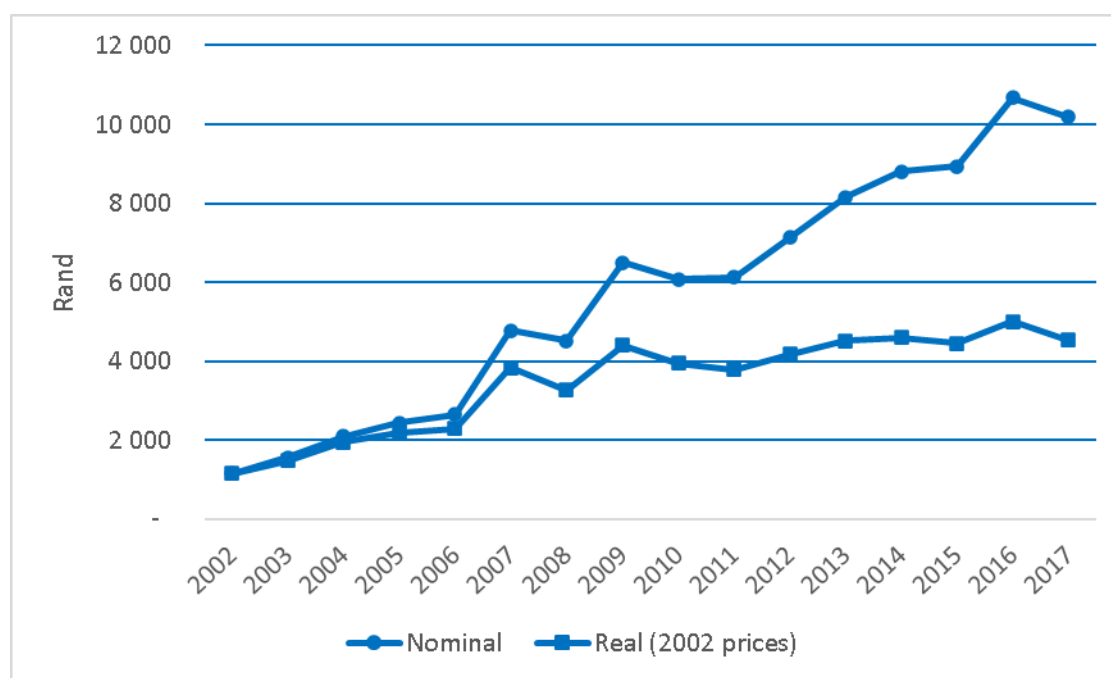


Figure 4.1: Trends of nominal and real average farmland prices for South Africa (2002-2017)

The farmland price index in relation to housing prices and net farm income is illustrated in Figure 4.2. From 2002 to 2006, land prices mirrored housing prices quite closely, but afterwards started rising more quickly than housing prices, while also showing more volatility. Also, it seems that the land value is somewhat sensitive to changes in net farm income (e.g., the peaks in 2009 and the dips in 2011 seem to coincide), but just as often they seem to move in opposite directions (e.g., from 2003 to 2005, and 2015 to 2017).

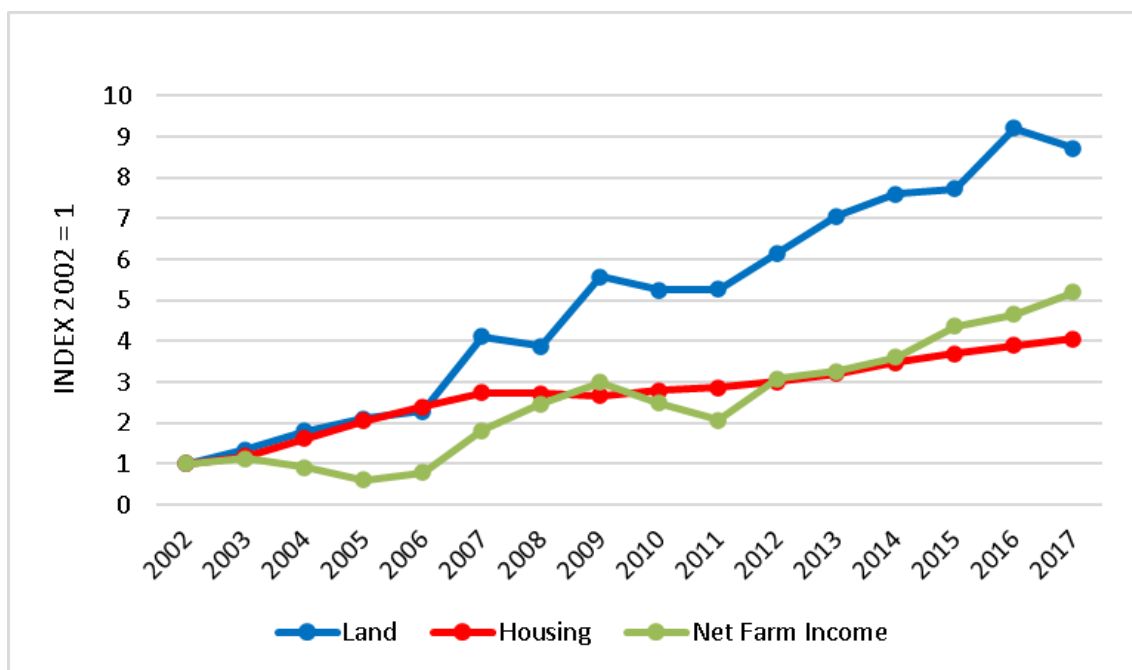


Figure 4.2: National nominal trends of the farmland price index in relation to housing and Net Farm Income (2002 – 2017)



The inflation-adjusted series make this even clearer. Figure 4.3 is the same as Figure 4.2, however the series are adjusted for inflation using the consumer price index. The land price and net farm income indices are quite volatile, while the housing price index is relatively stable. It is worth noting that between 2006 and 2007 there was a dramatic increase in land prices, and then again between 2008 and 2009, but thereafter land prices declined until 2011. The downturn in land prices seems to have started later than that of housing prices (which was presumably due to the global financial crisis of 2008), perhaps because during the period 2006 to 2009 there was a significant increase in net farm income. However, after 2011, the gradual and steady increase continued, for the most part mirroring the gradual and steady rise in net farm income. Obi and van Schalkwyk (2008) argue that increases in land prices have a significant negative impact on national development efforts, including the on-going land reform programme and other aspects of agricultural restructuring.

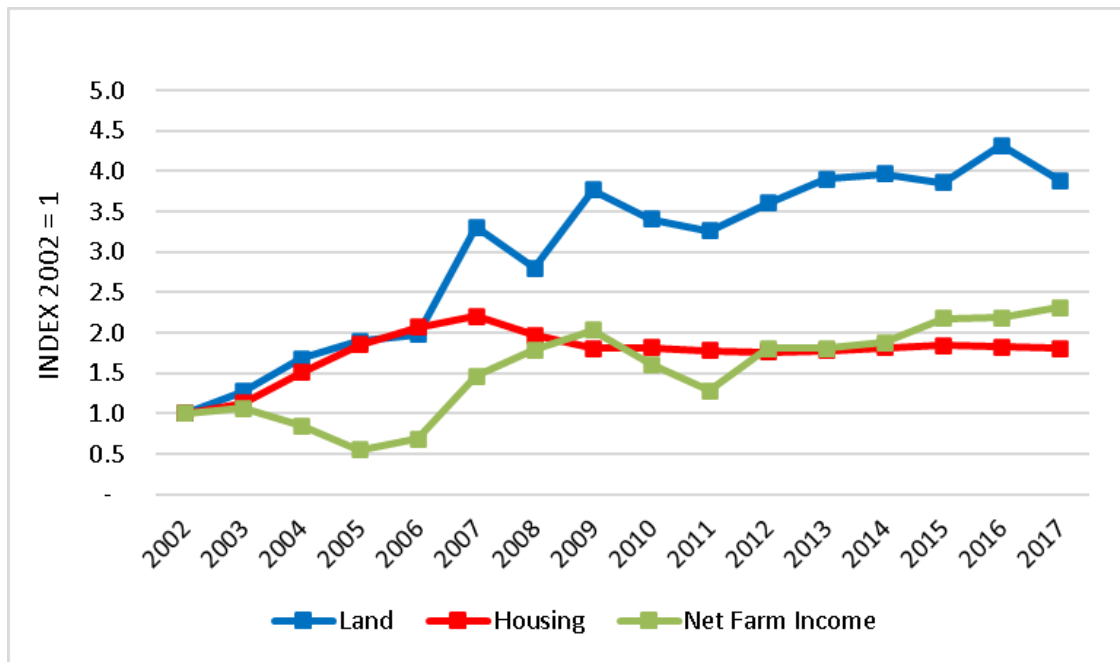


Figure 4.3: National real trends of the farmland price index in relation to housing and Net Farm Income (2002 – 2017)



To enhance the picture as to trends in the land market over this period, one may also consider how much land was transacted in the market, and how many transactions took place. As shown in Figure 4.4, there was a significant decrease in total hectares traded (measured on the left-hand vertical scale) as well as number of transactions (measured on the right-hand vertical scale). It is difficult to provide an explanation for this long, down-ward trend in the amount of farmland transacted in the market, in particular the fact that it coincides with a period during which for the most part real land prices are increases. The apparent incongruity reminds one of the facts that, for purposes of empirical land modelling, demand and supply models appear to have fallen out of favour, as noted in section 2.4.3. An absence of historical data for the South African land market is such that it is not known whether sustained declines in market activity have taken place previously or not, and if so, what drove such declines.

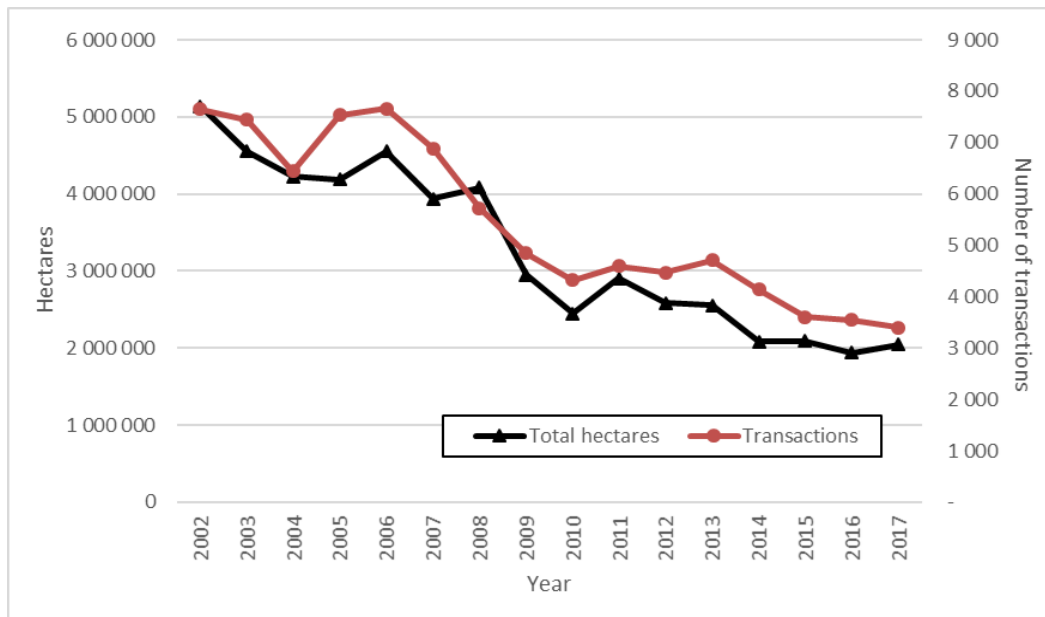


Figure 4.4: Market volume trends for South Africa (2002 – 2017)

One possibility that must be dismissed is that high or rising interest rates were dampening activity in the land market over this period. While these interest rates are by no means low by international (or at least, developed country) standards, South Africa's real interest rates showed a tendency to decline over this period, which if anything should have fuelled an increase in farmland market activity.

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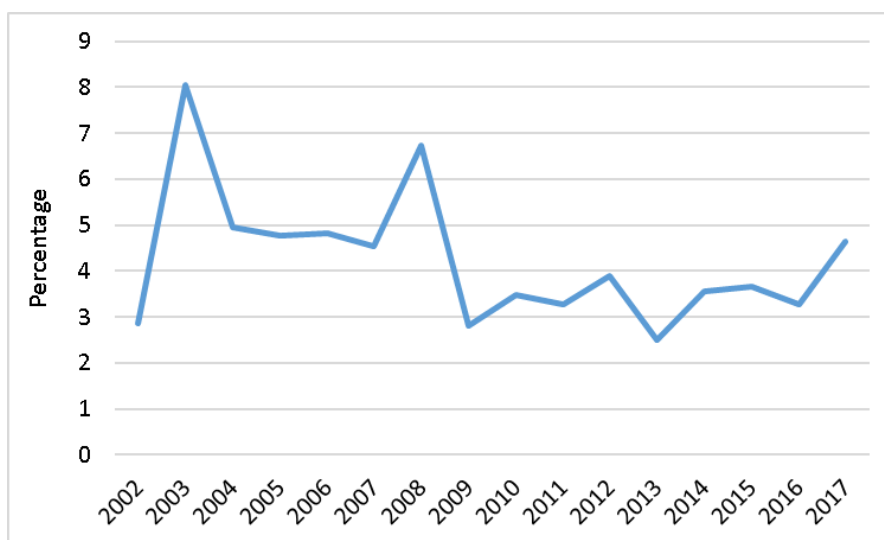


Figure 4.5: Real interest rates for South Africa (2002 – 2017)

Source: World Bank, 2017

Nor is it plausible to suppose that the decline in market transactions was due to the chilling effect of public debates regarding “expropriation without compensation”. These debates emerged out of the 2013 policy platform of a new political party, the Economic Freedom Fighters (EFF), and arguably only gained widespread attention when, in 2018, the Parliamentary Joint Constitutional Review Committee was tasked with reviewing Section 25 of the Constitution, meaning the ‘property clause’ which, inter alia, determines under what conditions land may be expropriated.

Given the similarity in house prices and land prices (see e.g., Figure 4.3), one might wonder whether transactions of houses over this period exhibited a similar downward trend to that of farmland. Unfortunately, no clear series of house transactions was found. The closest one could find was a graph that appeared in one edition of FNB’s *Property Barometer*, which summarised subjective responses of estate agents to FNB’s quarterly survey. Respondents were asked to rate the intensity of market activity in their areas using a subjective rating scale of 1 to 10. The graph amalgamates these responses to arrive at a collective impression of activity in the residential property market. The graph shows an overall decline for the period 2004 to 2018, but with a marked dip around 2008-2009 which does not correspond clearly to trends in the farmland transactions.

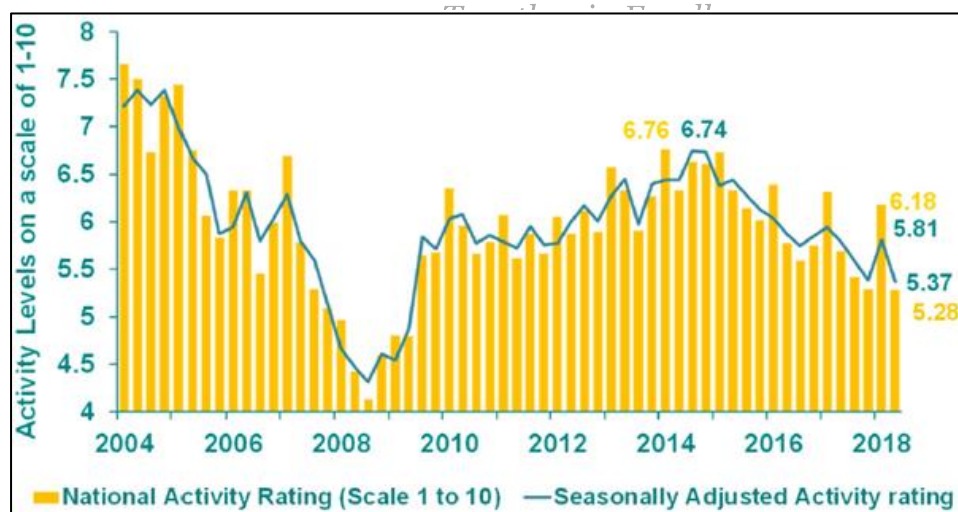


Figure 4.6: FNB Residential Market Activity Indicator

Source: FNB, 2018: 2

Beyond South Africa, it is in fact difficult to find trend data on the numbers and/or volumes of farmland transactions, whereas data on farmland *prices* is plentiful. Thus one is unable to say whether the juxtaposition indicated above of declining transactions and rising real prices is common or unusual. Similarly, the many contributions to the literature on farmland price determinants generally do not include transaction volumes as either an explanatory or co-dependent variable.

One non-South African dataset found was that for Ireland for 2013 through 2021, which distinguishes transactions of arable land and “permanent grasslands”. For each of these farmland types, between 2017 and 2021, there was a significant increase in average per hectare prices (140% and 36% for arable land and grasslands, respectively), concurrent with significant declines in the average amount of farmland area transacted (-59% and -13% for arable land and grasslands, respectively). The other non-South African dataset found was for part of the state of Virginia in the USA for the period 2002 through 2022. A similar pattern is observed there between 2003 and 2009, whereby prices increased in real terms by 67%, even while volumes declined by 92%. (See the Appendix 1 for graphs.) Thus the scenario sketched above in respect of South Africa’s farmland property market is not unique, but that in itself does not shed much light on the concurrence of declining transactions and rising real prices.



4.2.2 Provincial trends in average farmland price per hectare in South Africa

In order to present in a manner that is visible, the trends for the nine provinces are presented in groups of three in Figures 4.7, 4.8 and 4.9 below.

Figure 4.7 shows the average farmland price per hectare in Eastern Cape, Free State and Gauteng. All three provinces exhibited upward trends over the period 2002-2017, however it appears that Gauteng has more volatility than Eastern Cape and Free State. The reason for this may be that farmland prices in Gauteng are more influenced by non-farming land demand, or perhaps it is because the farmland market is relatively thin, therefore one or two outliers can significantly change the average price for a given year. The fact that farmland prices in Gauteng appear to have risen more than in the other two provinces, most likely reflects the fact that market prices for farmland often reflect (i.e. ‘capitalise’) the possibility of conversion to non-agricultural uses, especially in proximity to population centres, as observed by Mela et al. (2016).

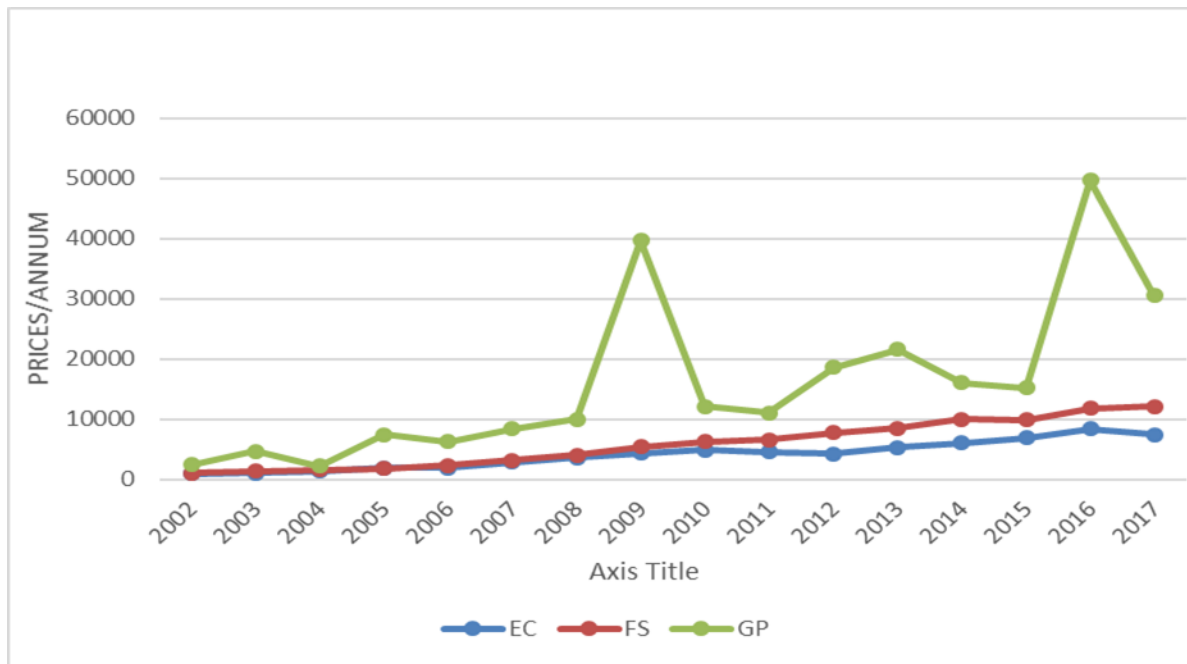


Figure 4.7: Trends of average farmland price per hectare in Eastern Cape, Free State and Gauteng (2002 - 2017)



Figure 4.8 shows the average farmland price trends for KwaZulu-Natal, Limpopo and Mpumalanga. The trends presented show that farmland prices in KwaZulu-Natal and Mpumalanga are more volatility than those in Limpopo. The average land prices were stable in Mpumalanga and Limpopo up until 2006. There was an upward blip for Mpumalanga and Limpopo between 2006 to 2007, and thereafter average price per hectare went down in both provinces, though at different rates. However, while average land prices are increasing in all the provinces, the patterns are quite different, suggesting that market forces have a significant local aspect, i.e. it is not as though land prices everywhere closely follow the national aggregate trend.

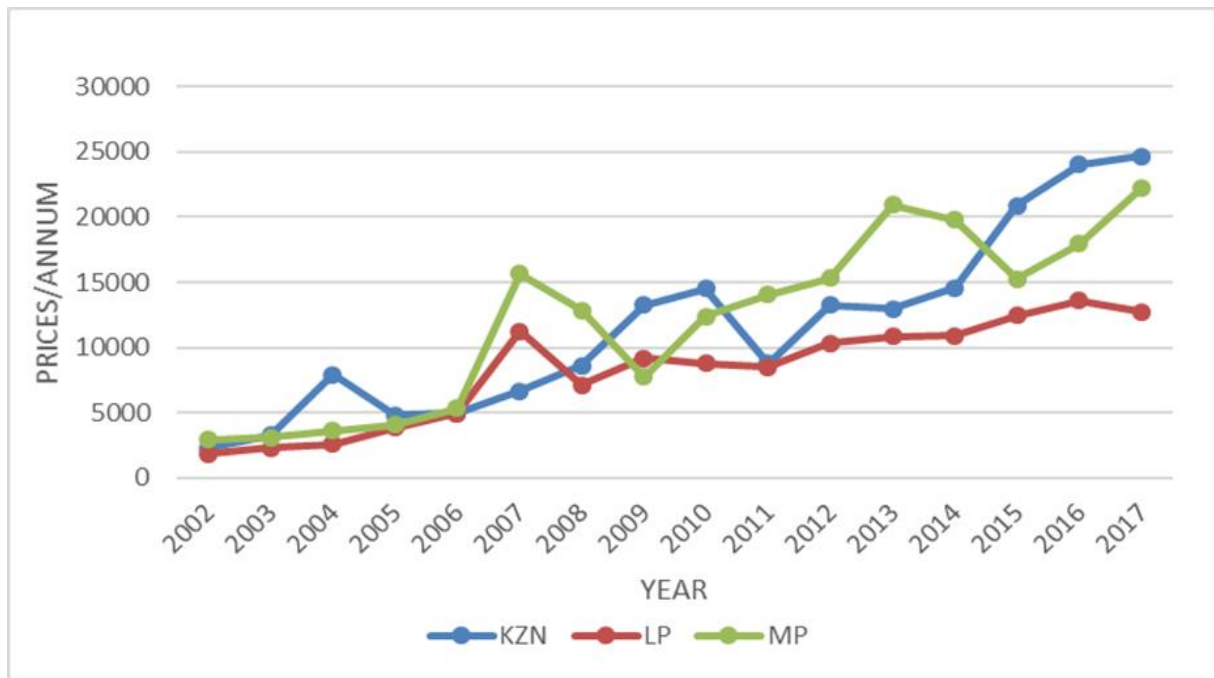


Figure 4.8: Trends of average farmland price per hectare in KwaZulu-Natal, Limpopo, and Mpumalanga

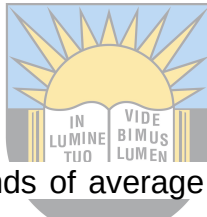


Figure 4.9 shows the positive trends of average farmland prices in Northern Cape, North West and Western Cape. From 2009, Western Cape started to have some fluctuations in average price per hectare. In North West the average land prices were relatively stable; it was only in 2015 where there was a significant dip.

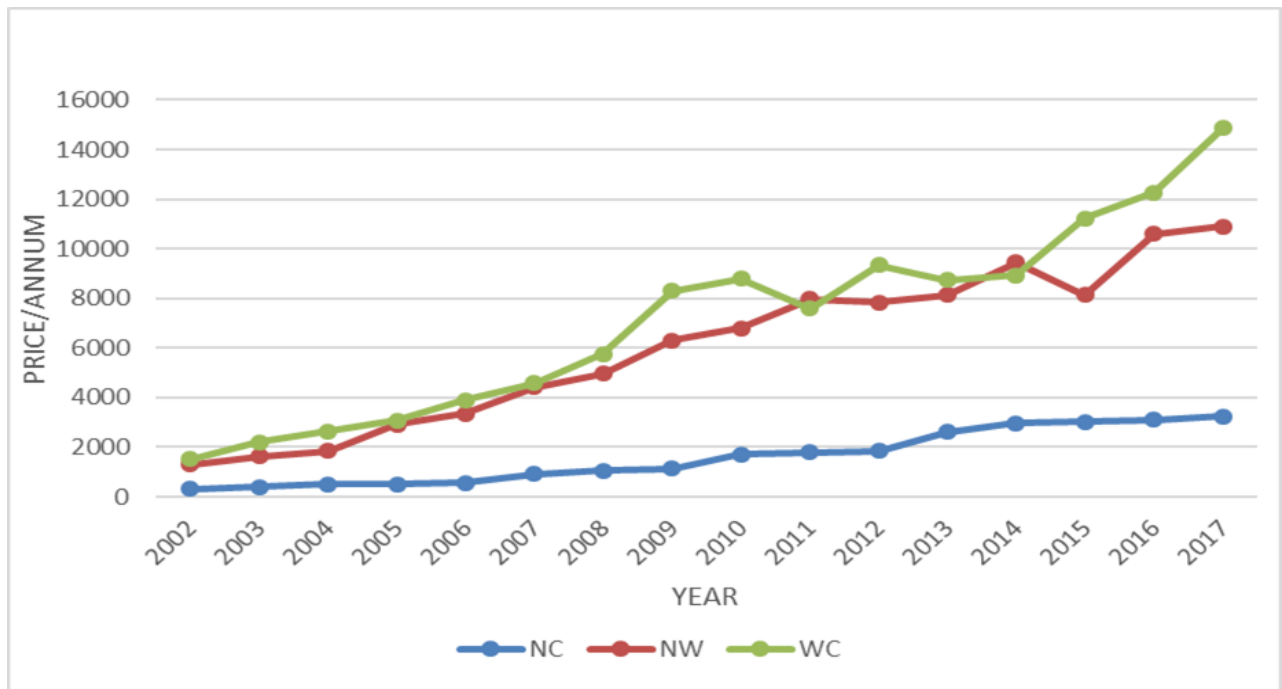


Figure 4.9: Trends of average farmland price per hectare in Northern Cape, North West and Western Cape



4.2.3 Implications for the ‘national property portfolio’

Based on the numbers below, one is now in a position to extrapolate as to the total market value of commercial farm real estate, and within this, the total value of land reform land. The table below shows the ‘order to magnitude’ extrapolated values per province and in total, for 2017, using as quantities the amount of commercial farmland reported in the 1993 Census of Agriculture (Central Statistical Services, 1998). The estimate of the total value of commercial farmland is just under R800 billion, of which about R107 billion is land reform land.

Table 4.1: Estimated value of commercial farmland, including land reform land

Province	Commercial farmland by hectares as of 1993	Average price per hectare in 2017	Extrapolated market value of all commercial farmland (R bn)	Extrapolated market value of land reform farmland (R bn)
Western Cape	10 249 665	12 266	125.7	6.9
Eastern Cape	10 319 563	7 418	76.6	5.0
Free State	11 321 192	12 106	137.1	5.9
Gauteng	674 894	30 468	20.6	2.4
KwaZulu-Natal	4 064 032	24 671	100.3	35.6
Limpopo	5 335 289	12 717	67.9	9.2
Mpumalanga	4 648 309	22 207	103.2	22.4
North West	6 184 009	10 900	67.4	13.1
Northern Cape	29 962 349	3 239	97.1	6.6
Total	82 759 302		795.7	107.1

Sources: Central Statistical Service, 1998, and own calculations



Then, using estimates for other types of real estate produced by the Property Sector Charter Council for 2015 (translated here into 2017 Rand by means of the cpi), one can appreciate the magnitude of commercial farmland relative to the property sector more generally. (Seemingly, commercial farmland is altogether omitted from the Council's estimates; see Property Sector Charter Council, 2015: 19. So are all forms of property within the former homelands, as well as the 'informal residential sector.') According to these figures, commercial farmland comprises about 11% of the value of all real estate in South Africa, which is surprisingly high perhaps given that commercial agriculture comprises less than 3% of GDP. Even more surprising is that commercial farmland has an estimated value more than three times that of the industrial sector. The estimated share accruing to land reform land is very small at only 1.5% of the total, which happens to be very similar to the value of vacant land in residential areas.

Table 4.2: Estimates of the value of South African property in 2017, by type

Type of real estate	Estimated value (R billions)	Share
Residential	4 356	62.5%
<i>Buildings</i>	4 259	61.1%
<i>Land</i>	96	1.4%
Commercial	1 418	20.4%
<i>Retail</i>	598	8.6%
<i>Office</i>	400	5.7%
<i>Industrial</i>	315	4.5%
<i>Other</i>	105	1.5%
Public	398	5.7%
Commercial farms	796	11.4%
<i>Non-land reform</i>	689	9.9%
<i>Land reform</i>	107	1.5%
Total	6 967	100.0%

Sources: Property Sector Charter Council (2015), and own calculations

4.3 LAND PRICE AND VOLUME TRENDS OF LAND REFORM LAND



4.3.1 National-level aggregate trends for redistribution and restitution

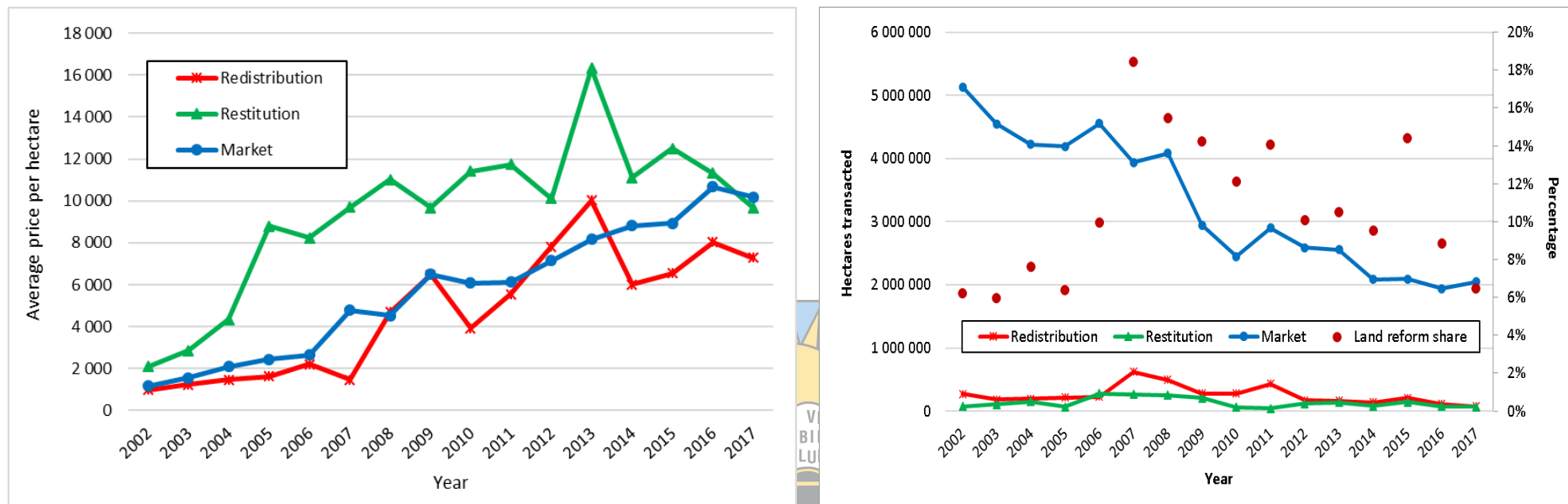


The figures below seek to show how the market for 'land reform land' compares to that of other farmland in terms of prices and volumes over time. Before considering the detail, two broad observations are in order. First, the average amounts of money paid for land reform land tends to deviate significantly from the trend for the land market, but also, there are stark differences between the two main parts of redistributive land reform, namely redistribution and restitution. Secondly, the volumes transacted in the land reform programmes are generally small relative to those of the land market, even towards the latter part of the period at which point transactions in the market are lower than at the beginning.

Figure 4.10a illustrates that prices paid for land for the redistribution programme tend to be on a par with, or lower than, those of the land market, except in 2012 and 2013 when the average price of land for redistribution was higher. By contrast, with the exception of 2017, prices paid for land under the restitution programme have exceeded land market prices, often by a considerable margin. From 2013, the average price per hectare for restitution land appears to have declined to a point where it was no longer more expensive than land in the open market; this may have been caused

by the public debate that erupted around that time on “land expropriation without compensation”, during which time the issue of land owners getting large payments was receiving heightened scrutiny.

In terms of amounts of land transacted, Figure 4.10b shows the same trend of hectares as shown in Figure 4.4, as well as the hectareage trends for redistribution and restitution. The difference in scales is such that the extent of the variation in the hectareage series for redistribution and restitution are difficult to discern, which is the rationale for also showing Figure 4.10c. However, even though the difference in scales is such that one is tempted to conclude that land reform would not likely have an effect on the land market, in reality that depends on what year one is speaking of. Figure 4.10b also shows the ratio of land reform hectareage relative to total hectareage transacted (measured on the right-hand scale), which ranges from a low of 6% in 2002-2003, and 2017, to a high of 18% in 2007. If one were to make a case that a great deal of land reform activity could place an upward pressure on market prices, one might expect to see it in 2007; returning to the 'Market' series in Figure 4.10a, one does see what appears to be an upward blip exactly in 2007, but it is muted. In any case, to the extent land reform represents an exogenous increase in land demand which would have the effect of exerting an upward pressure on market prices, one would expect that relationship to be more evident at provincial or sub-provincial level, which is considered in the sections below.



Figures 4.10a and 4.10b: Land price and volume trends for farmland market, redistribution and restitution, RSA (2002 – 2017)

It is noteworthy that ever since 2008, the total hectares transacted through the redistribution programme has been declining, though the rate of redistribution has fluctuated. The High Level Panel on the Assessment of Key Legislation and the Acceleration of Fundamental Change explained that, “The Land Reform budget has generally been between 0.15% and 0.4%, reaching a peak of 0.44% of the national expenditure in 2008/09 and then declining to 0.2% in the current financial year” (High Level Panel, 2017:215). The declining budget of land reform is linked with the downward trend presented in the Figure 4.10c for redistribution and restitution programmes.

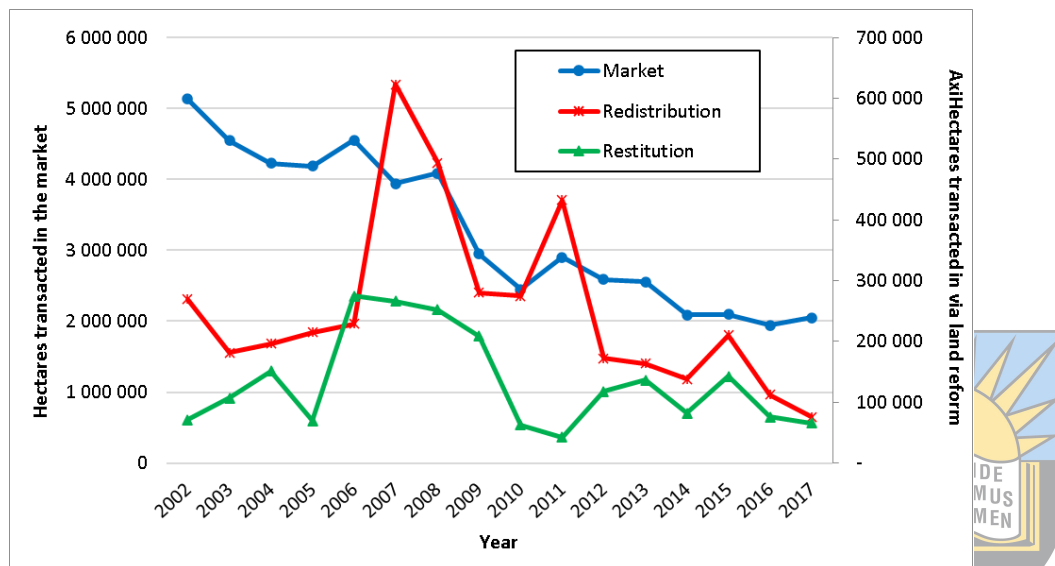


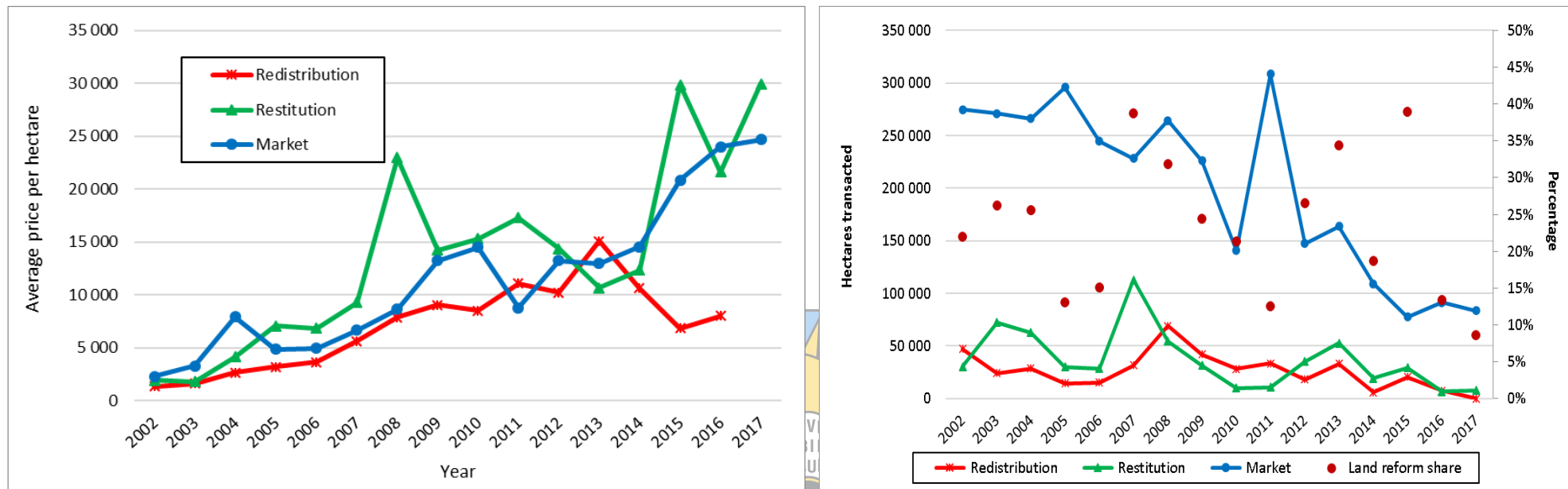
Figure 4.10c: Land price and volume trends for farmland market (left-hand scale), redistribution and restitution (right-hand scale), RSA (2002 – 2017)

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4.3.2 Provincial trends in average price per hectare for the farmland market and land reform

The average price of land per hectare in South Africa have been obtained at district level and aggregated to province level. However, in some local municipalities in some years there are no land reform transactions. The values are in nominal terms and the trends for the provinces are presented below. However, three provinces are presented and discussed in this chapter and the rest are included in Appendix 2.

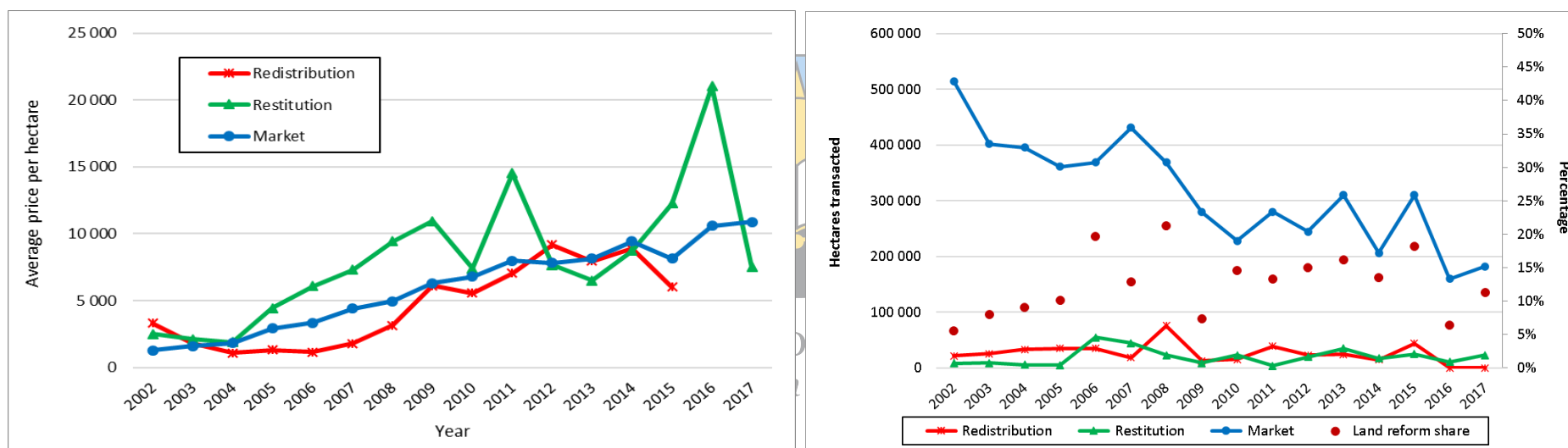
Figure 4.11 illustrate the average farmland prices and volume trends for farmland market, redistribution and restitution in KwaZulu-Natal. The graph shows that restitution programme prices are considerably more volatile than redistribution prices and market prices, presumably reflecting the reality that a few rural restitution projects are fantastically expensive, such as the R1 billion paid to settle the Mala Mala land claim in 2013, which for a while served as a *cause célèbre* for various land reform critics, including the Economic Freedom Front (Alasow, 2020). (To be clear, Mala Mala is in Mpumalanga, not KwaZulu-Natal, however, illustrates the point.) However, in 2015 there was a dip in redistribution programme prices in the course of which they fell to have of their 2013 level. As for volume trends, both farmland market transactions and land reform programme transactions in KwaZulu-Natal are relatively unstable. The peak in 2007 in the number of hectares restituted appears to coincide, more or less, with the spike in the price per hectare of restitution transactions, possibly implying that the latter led to the former. Another point of interest in the volume graph at right is the extremely sharp blip in 2011 for the land market. Nothing like this blip appears in the graphs for the three other show-cased provinces below. In any case the land market volume returned to 'normal' by 2012. This underlines the conclusion that as much as a province is an arbitrary geographical demarcation, there appear to be truly patterns in the farmland markets that exist in different parts of the country, implying distinct forces at work. Lastly, the right-hand graph shows that in some years, land reform accounts for a very high share of farmland transactions. In 2007 and again in 2015, for example, land reform as a share of all land transacted came to 39%. The relatively high land reform shares are logically closely related to the observation from Table 3.1 that an unusually high proportion of commercial farmland has been transferred or acquired by means of the land reform programme in KwaZulu-Natal specifically.



Figures 4.11a and 4.11b: Land price and volume trends for farmland market, Redistribution, Restitution in KwaZulu-Natal (2002 – 2017)

Figure 4.12 shows the average farmland prices and volume trends for the farmland market, Redistribution, Restitution in North West. From 2004 to 2009 the restitution programme prices have been increasing at an increasing rate. With the exception of a dip in 2015, farmland prices have been relative stable in the observed period. Furthermore, it was only in 2002 and 2012 when the redistribution programme prices were above the farmland prices; at other times land redistribution prices have generally been on a par with, or below, the land market. As often seems to be the case, prices paid for restitution land have been highly volatile. In terms of transaction

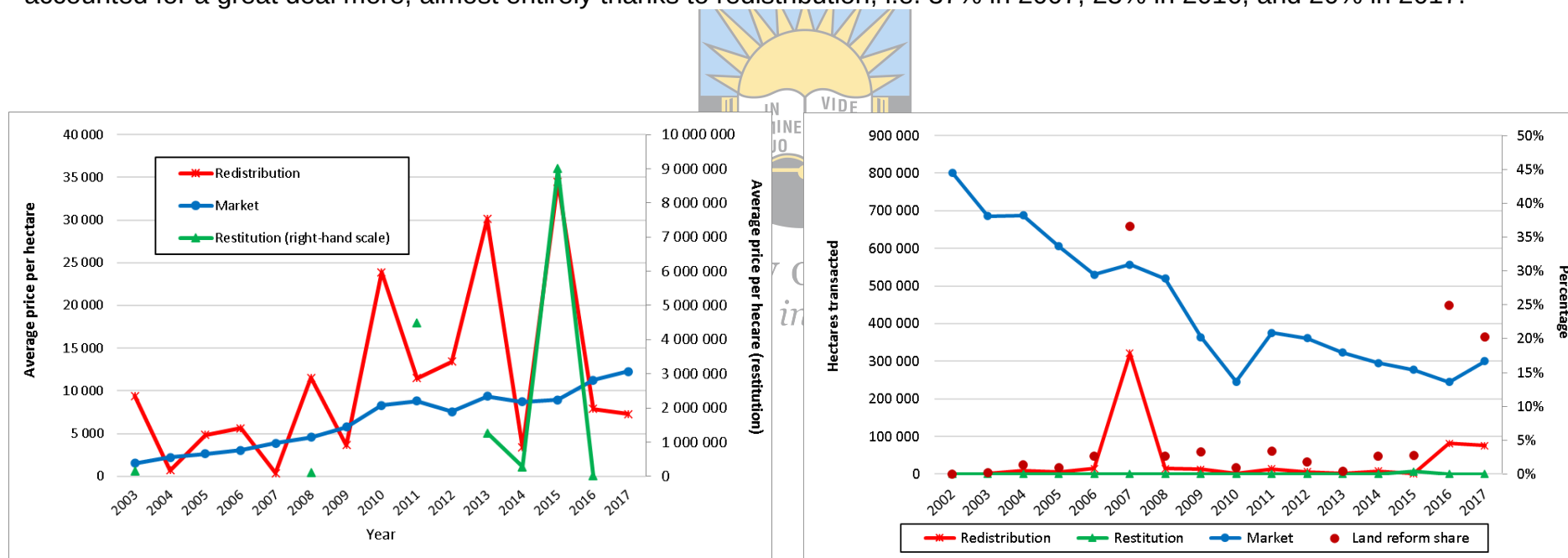
volumes, the market trend in North West province is similar to that for the country as a whole, meaning of about a decline of more than 50% in numbers of hectares transacted per year. While not reaching as high as in KwaZulu-Natal, hectares of land reform transactions as a share of all rural land transactions was nonetheless more than 10% for much of the period 2002-2017, over in contrast to KwaZulu-Natal was quite steady. This accounts for the fact that North West ranks third among provinces in terms of the share of commercial farmland acquired via government's land reform programme.



Figures 4.12a and 4.12b: Land price and volume trends for farmland market, redistribution, Restitution in North West (2002 – 2017)

Finally, price and volume trends for the Western Cape are presented in Figure 4.13. The Western Cape is quite distinct in both respects. First, the volatility in the average price per hectare paid for land reform land in Western Cape is extremely high, very likely

because land reform transactions in the Western Cape are relatively few. This is especially true in terms of rural restitution. In fact, the average price per hectare for restitution was so high in 2015 that one was obliged to measure restitution prices on a separate scale, in this case meaning the right-hand vertical scale depicted in the left-hand graph comprising Figure 4.13. The right-hand side graph shows that the Western Cape has experienced the same downward trend in area transacted in the market as the rest of the country; it also shows how land reform features in the farmland market in a very different manner than in, say, North West province; whereas in North West (Figure 4.12) land reform accounts for a fairly steady share of farmland transactions over time, in the Western Cape the pattern is that in most years land reform features very little (e.g., 0% to 3% of land transacted), but also on three occasions accounted for a great deal more, almost entirely thanks to redistribution, i.e. 37% in 2007, 25% in 2016, and 20% in 2017.



Figures 4.13a and 4.13b: Land price and volume trends for farmland market, Redistribution, Restitution in Western Cape (2002 – 2017)

Bearing in mind the provincial patterns of declining marketing volumes described above, one wonders whether there is a relationship to the extent of land reform per province, as reported in Table 3.1 above. The figure below suggests the possibility of a relationship, however it is far from conclusive.

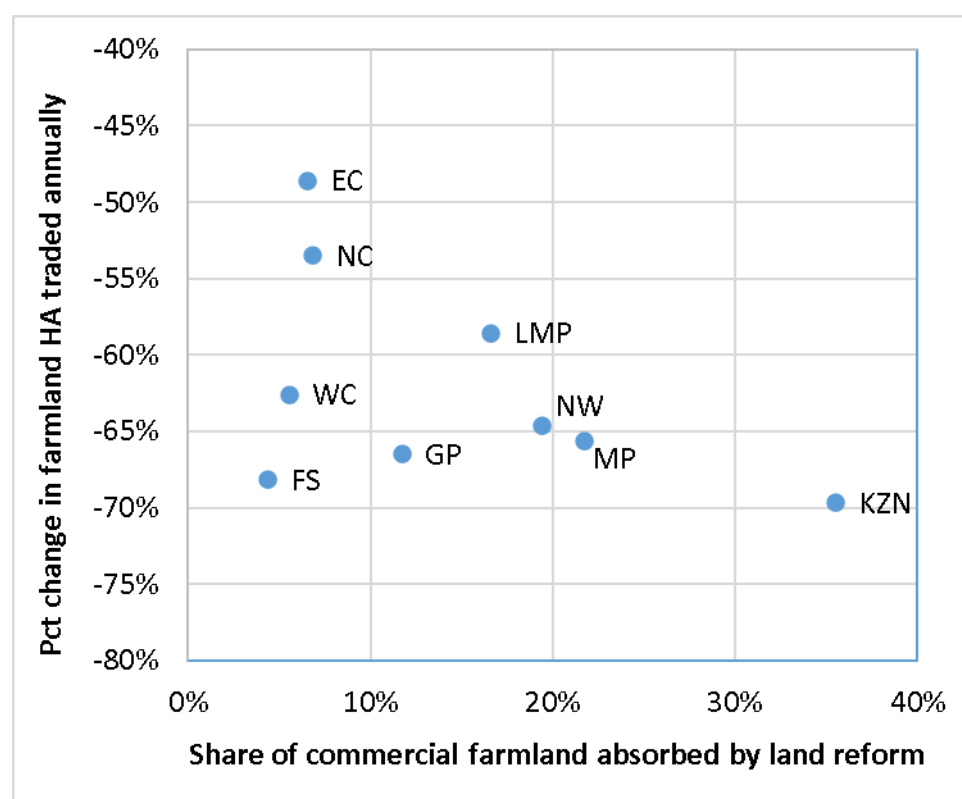
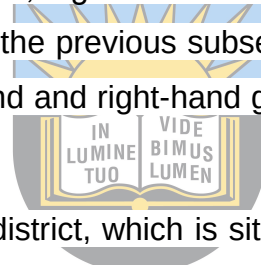


Figure 4.14: Share of commercial farmland acquired for land reform (1994-2018) versus percentage decline in hectares transacted in the market (2002-2017)

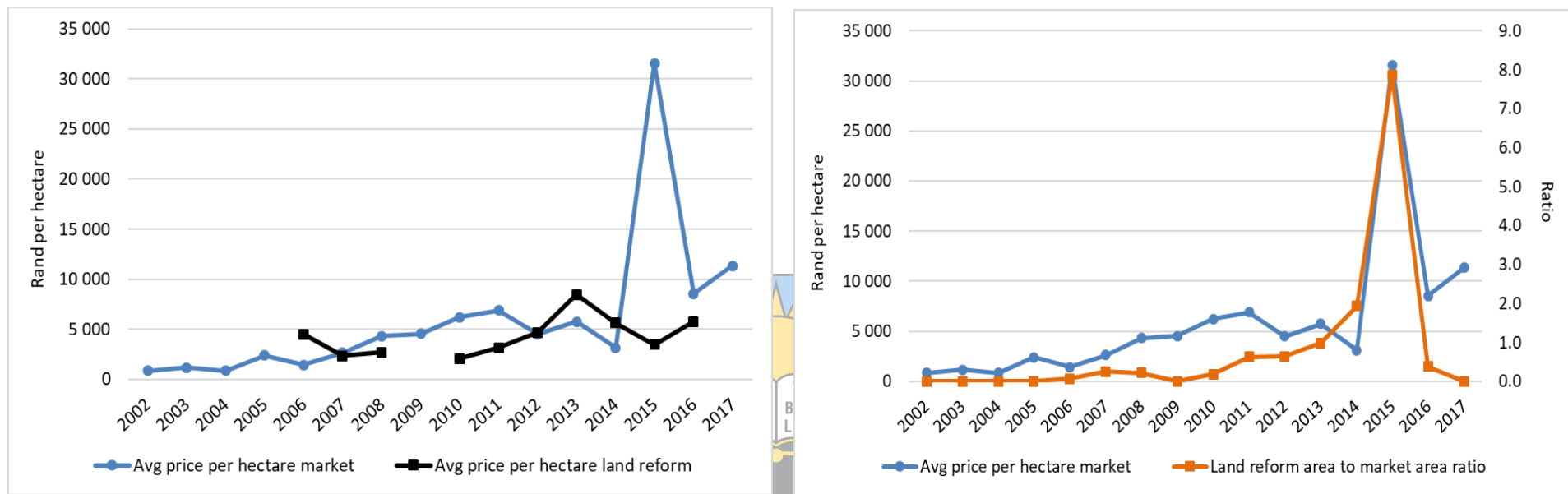
Overall, there appears to be a negative relationship, whereby the greater the share of commercial farmland acquired for land reform, the greater the decline in marketed volumes. The Pearson correlation coefficient is a reasonably strong -0.49. The relationship could for instance be that the greater the extent of land reform, the less commercial farmland is available to be traded in the market, and also the less enthusiastic is the public at large to acquire land for mainly investment purposes. However, three provinces do not fit the pattern, namely Western Cape, Gauteng and Free State; these three are among those with the largest declines in volumes of farmland traded annually, despite modest amounts of land acquired for land reform.

4.3.3 Comparison of average price of farmland between market and land reform programme at district level

In order to complement the discussion above at national and provincial level, some focus is shone on four districts, selected on the basis that they have experienced unusually high levels of land reform. The rationale is that, in terms of the underlying logic of the conceptual framework, to the extent land reform has an impact on farmland market prices, one would expect to observe it in areas where land reform has been concentrated. For each of the four selected districts, two graphs are presented, of which the one shows for each year the average price for land reform land together with the average price for farmland in the market, and the other graph again shows the average price for farmland in the market, together with the 'land reform area to market area ratio', which is similar to the land reform share series shown in the graphs in the previous subsection. Note that although the average price for farmland series (blue line) is the same series for both the left-hand and right-hand graphs, the vertical scales are not always the same, such that the appears of the series may differ.



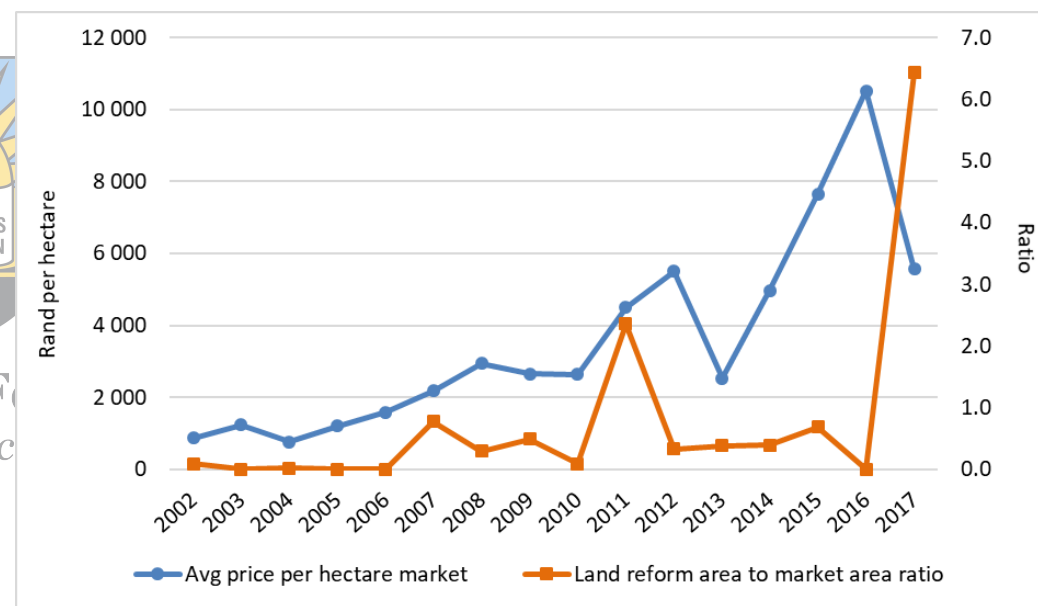
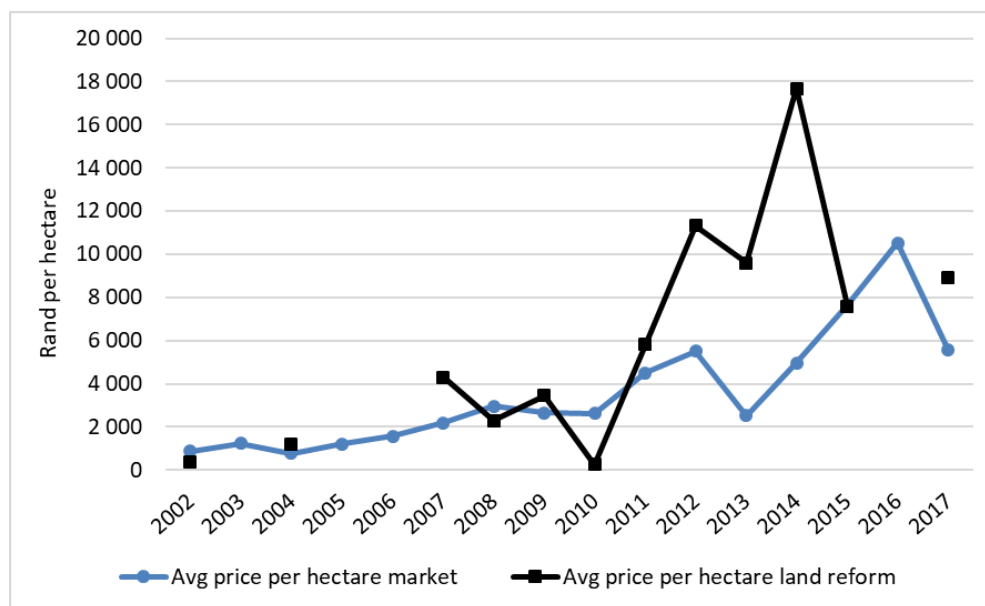
The first district considered is Helpmekaar-uMzinyathi district, which is situated in the central part of KwaZulu-Natal province. The picture shown in Figure 4.15 is in fact quite surprising. According to the left-hand graph, the price per hectare of land reform land and in the market are on a par, except for a sudden and dramatic departure in 2015, at which point the average price per hectare of land in the market shoots up to a level several times what it was before and to which it returns after. Time-wise, this dramatic increase in the price per hectare of farmland in the market coincides exactly with the equally dramatic increase in the ratio of land reform land to land transacted in the market; the curiosity is that the increase in market prices appears to have been prompted by the sudden increase in land reform, even though the price per hectare of the land reform land did not itself rise in 2015.



Figures 4.15a and 4.15b: Average price per hectare for market, land reform and land reform to market area ratio in Helpmekaar- uMzinyathi district, KwaZulu-Natal (2002 – 2017)

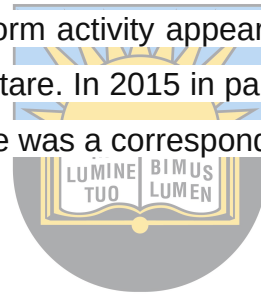
The second district focused upon is Mahikeng, which is in the central part of North West province. The left-hand graph that makes up Figure 4.16 below shows that the average price per hectare for land reform land significantly exceeds the average price per hectare in the market in 2012, 2013 and 2014; however, it also appears to show that, although the average land price in the market does not keep pace with the per hectare price for land reform land, it nonetheless rises significantly in this period. The right-hand

graph is also more suggestive than conclusive; it suggests that the rise in market prices coincides with the sudden uptick in the land reform to market ratio in 2011, but that market prices continue to rise even though the land reform to market ratio declines again for a while. The significant increase in market prices between 2013 and 2016 seems to anticipate the dramatic upturn in the land reform ratio that takes place between 2016 and 2017. This is not impossible, in the sense that land reform transactions can take a long while to complete and can in principle have an impact on local market conditions or perceptions even before the transactions are consummated.

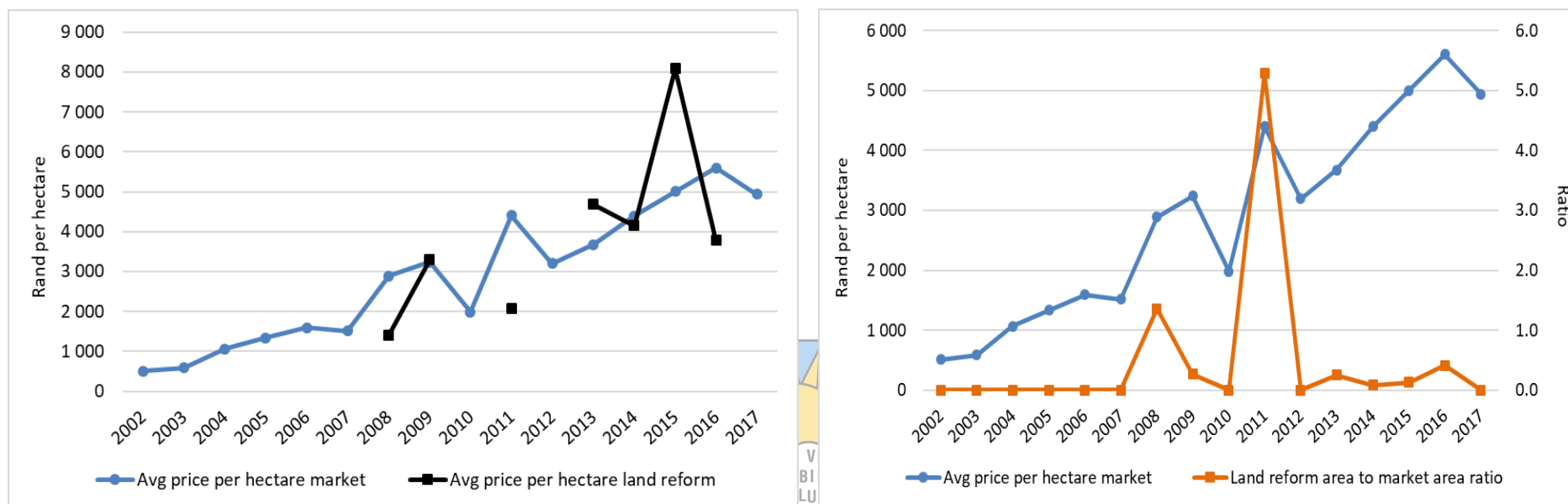


Figures 4.16a and 4.16b: Average price per hectare for market, land reform and land reform to market area ratio in Mahikeng, North West (2002 – 2017)

The third district of interest is Barkly-Wes, which is in the Northern Cape. As shown by the blue series in both graphs making up Figure 4.17 below, market prices rose dramatically in the area for most of the 2002 - 2017 period, and certainly this pattern was established before land reform had a presence. However, around 2008 and 2009, some land reform activity registered, coinciding with a moderate spike in market prices, i.e. above and beyond the already robust upward trajectory. Then, in 2011, there was an even more dramatic upsurge in land reform activity, as shown by the spike in land reform to market ratio; this appears to coincide with another spike in the per hectare market price. The per hectare market price came down again in 2012, only to resume its aggressive upward trend. From 2012 to 2016, land reform activity appears to be minimal, although to the extent it continued, it is associated with an erratic pattern of prices paid per hectare. In 2015 in particular, the per hectare price for land reform land spiked; although it is difficult to say, it does not appear that there was a corresponding effect on market prices.



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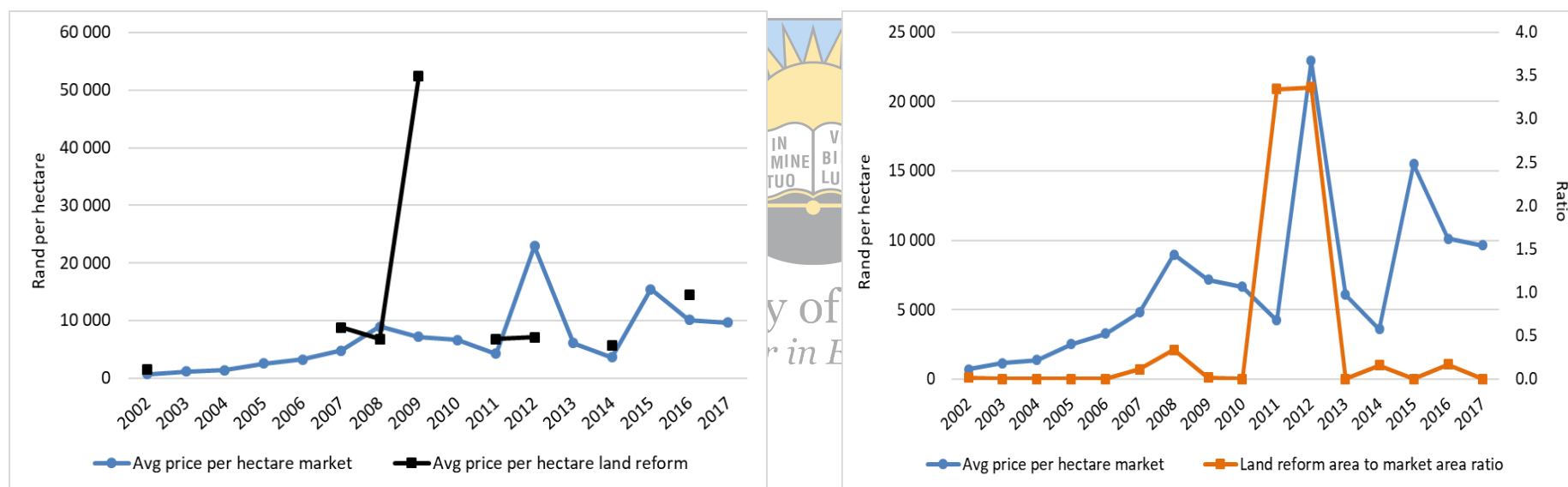


Figures 4.17a and 4.17b: Average price per hectare for market, land reform and land reform to market area ratio in Barkly-Wes, Northern Cape (2002 – 2017)

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The fourth and final district inspected is Komga, which is located in the Eastern Cape. Land reform came and went in the district; in 8 of the 16 years included in the series, there was no land reform at all, i.e. 2003-2006, 2010, 2013, 2015 and 2017. According to the left-hand graph, the price per hectare of land reform land and in the market were comparable for most years in which there was any land reform at all, with the singular exception of 2009, at which point the average price per hectare of land reform shot up to a level several times higher than what it was before or after.

On the right-hand graph, there is a modest rise in the land reform ratio in 2008, which appears to correspond with a modest spike in the average farmland market price. In 2011 and 2012, there was an even more dramatic upsurge in land reform activity, as shown by the spike in land reform to market ratio; this appears to coincide with another surge in the per hectare market price in 2012. What is curious is that the spike in average price per hectare of land reform land, is not at all associated with an uptick in the market price. Lastly, in 2015, there was an increase in the per hectare market price which does not seem to be associated with anything to do with either the land reform to market ratio, or the per hectare price paid for land reform land.



Figures 4.18a and 4.18b: Average price per hectare for market, land reform and land reform to market area ratio in Komga, Eastern Cape (2002 – 2017)

Table 4.3 compares the impact of the land reform ratio and the prices paid for land under the land reform programme on market prices in various South African districts. According to trends illustrated above in the graphs, there is no relationship between prices paid for land reform land and the market price. Nonetheless, the land reform ratio appears to be strongly related to the market price, with the exception of Mahikeng district in North West Province. The other thing to note about the price increases that appear to result from a surge in land reform activity, is that they are not enduring; rather, average farmland prices generally seem to fall as quickly as they rose or, put differently, as quickly as the surge in land reform falls away – which in these four cases at least it always did – prices either fell back to more or less their earlier levels, or they resumed their already-evident upward trajectory (see e.g. Barkly-Wes, but also perhaps in Komga). The situation is quite curious: clearly these dramatic surges in market prices are not due to prices paid for land reform land, thus they appear to be a spontaneous reaction of the land market. On the other hand, they fade very quickly, which presumably is a good thing for land reform.



Table 4.3: Summary of inferences from visual inspection of district graphs

District	Influence of prices paid for land reform land on the market price	Influence of the land reform ratio on the market price
uMzinyathi (KwaZulu-Natal)	No apparent influence	Clear influence
Mahikeng (North West)	No apparent influence	Somewhat clear influence, possibly with lagged effect
Barkly-Wes (Northern Cape)	No apparent influence	Clear influence, possibly with lagged effect
Komga (Eastern Cape)	No apparent influence	Clear influence

4.3.4 Statistical comparison of average land prices

This section conducts a simple statistical test of land reform prices relative to farmland market prices. Table 4.4 presents a comparison of the average (inflation-adjusted) price for land reform land versus the land market using the paired two-sample t-test,

in order to test statistically whether in fact average prices of land reform land differ from those of the land market. For South Africa as a whole, the average price of redistribution land is significantly below the general price of land in the market, while the average price of restitution land is significantly more than the general market price of land. At provincial level, most of the comparisons are not statistically significant, perhaps owing to the fact that there is a lot of year-to-year volatility in prices paid for land reform land, and few annual observations on which to base the statistical test. For redistribution, the general observation is that in some provinces the average price paid for redistribution land is higher than the average market price, and in other provinces it is low. (As will be discussed below, redistribution can be further disaggregated between PLAS and other forms of redistribution, each of which relate to average farmland prices in different ways.) By contrast, the average price of restitution land is always higher than the market price, though only in North West and the Northern Cape are these differences statistically significant.



Table 4.4: Paired two-sample t-tests for prices paid for land reform land relative to commercial farmland prices

	Redistribution vs Market		Restitution vs Market	
	Mean difference (2017 Rand)	P (T ≤ t), two-tail	Mean difference (2017 Rand)	P (T ≤ t), two-tail
South Africa	-1 444	**0.011	+5 872	***0.000
Eastern Cape	+2 356	0.194	NA	NA
Free State	-68	0.833	-217	0.633
Gauteng	-4 858	**0.012	+44 817	0.244
KwaZulu-Natal	-2 262	***0.005	+1 327	0.129
Limpopo	+3 096	0.184	+971	0.114
Mpumalanga	-2 975	***0.001	+7 835	0.234
Northern Cape	+112	0.163	+377	**0.022
North West	-524	*0.095	+1 414	***0.008
Western Cape	+2 926	*0.053	+1 190 308	0.122

An attempt was also made to disaggregate redistribution between PLAS-based redistribution and non-PLAS forms of redistribution. The challenge with this was that the number of years for which data were available for each type of redistribution was

more limited, such that for the most part there was little statistically significant pattern either way. Having said there, there is not much evidence that more has been paid per hectare via PLAS than via the other types of redistribution that largely preceded PLAS (i.e. SLAG and LRAD), apart from what can be explained by the increasing price trends of land generally (see Figure 4.19).

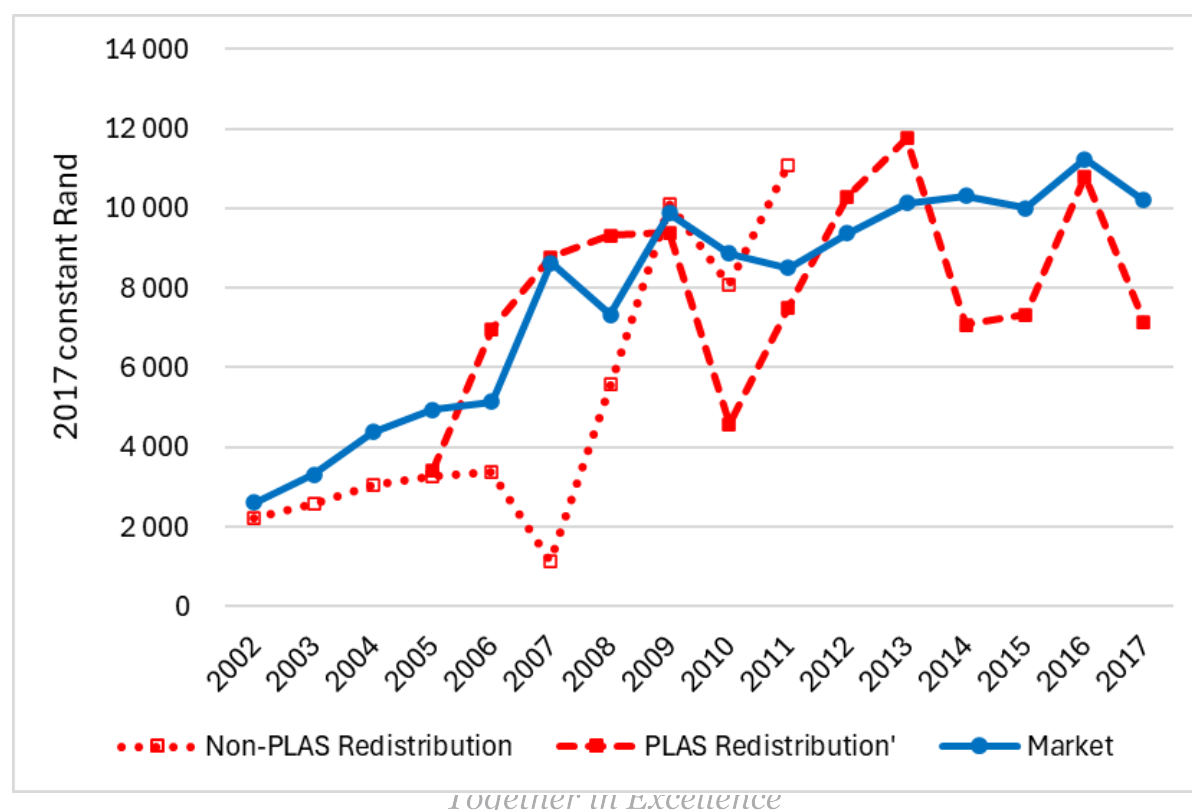


Figure 4.19: Average price per hectare for market and two types of redistribution (Non-PLAS and PLAS), 2002 – 2017

As will be discussed in the next section, the curiosity is that PLAS and non-PLAS forms of redistribution appear to affect the land market in quite different ways.

4.4 PANEL DATA REGRESSION ANALYSIS

The study aims to examine the effects of the land reform programme on South Africa's land market. The panel data regression is employed to explore the relationship. There are two datasets used, the one of mainly provincial-level data, and the other of district-level data.

4.4.1 Deciding on the functional form and the estimator

Since there is no guidance from theory as to the appropriate functional form for the research question at hand, the focus was on the statistical properties of the error / residual. A post-diagnostic test for the normality of the residual was conducted in the form of Q-Q plots. These were utilised to test for the normality of the residuals, which in turn is the basis for hypothesis testing. If the residuals approximate a normal distribution, the points on the Q-Q plot should more or less fall along the diagonal line (Wooldridge, 2002b). Deviations from this line can indicate non-normality, which can affect the validity of statistical tests and confidence intervals. One possible remedy for this is to consider an alternative functional form. Ghidoni et al. (2016:13) suggest that, "To fulfil the assumptions of normal distribution of residuals and homogeneity of variance the logarithm of the dependent variable is used".

For purposes of this study, the provincial and district-level regressions were first run using the non-logarithmic version of the dependent variable (average price per hectare of farmland) and of one of the key explanatory variables, namely agricultural value added per hectare, i.e.:



$$\begin{aligned} \text{Apphmakt}_{it} = & \beta_0 + \beta_1 \text{AVAPH}_{it} + \beta_2 \text{RIRATE}_t + \beta_3 \text{PopDens}_{it} + \\ & \beta_4 \text{TransRestn}_{it} + \beta_5 \text{TransRestn}_{it-1} + \beta_6 \text{TransNonPLAS}_{it} + \\ & \beta_7 \text{TransNonPLAS}_{it-1} + \beta_8 \text{TransPLAS}_{it} + \beta_9 \text{TransPLAS}_{it-1} + \varepsilon_{it} \end{aligned}$$

In the figure below, the left-hand graph is the Q-Q plot associated with the model above using the provincial-level data, while the right-hand graph is the Q-Q plot associated with the same model but using the district-level data. Given the strong deviations from the diagonal, following Ghidoni et al., a partial logarithmic version was tried, for which the Q-Q plots are shown in Figure 4.20 and 4.21.

$$\begin{aligned} \text{Ln(Apphmakt)}_{it} = & \beta_0 + \beta_1 \text{Ln(AVAPH)}_{it} + \beta_2 \text{RIRATE}_t + \beta_3 \text{PopDens}_{it} + \\ & \beta_4 \text{TransRestn}_{it} + \beta_5 \text{TransRestn}_{it-1} + \beta_6 \text{TransNonPLAS}_{it} + \\ & \beta_7 \text{TransNonPLAS}_{it-1} + \beta_8 \text{TransPLAS}_{it} + \beta_9 \text{TransPLAS}_{it-1} + \varepsilon_{it} \end{aligned}$$

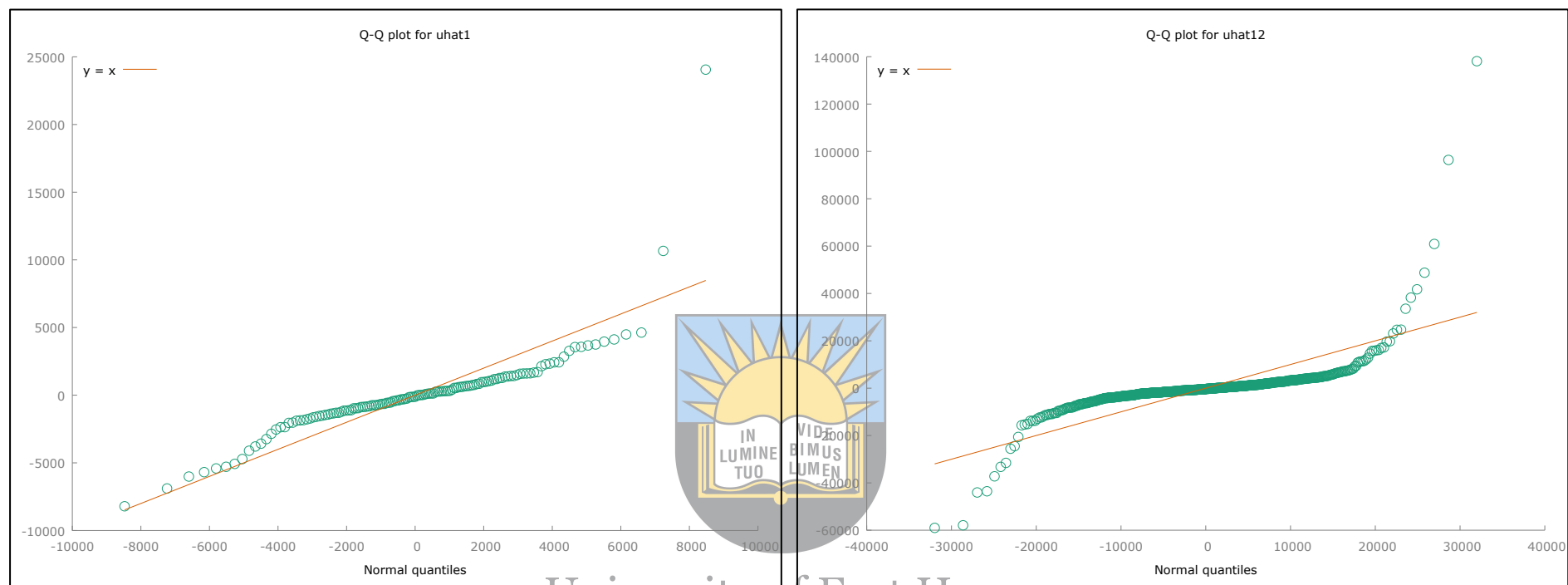


Figure 4.20: Q-Q plots for non-logarithmic functional forms for provincial-level data (left) and district-level data (right)

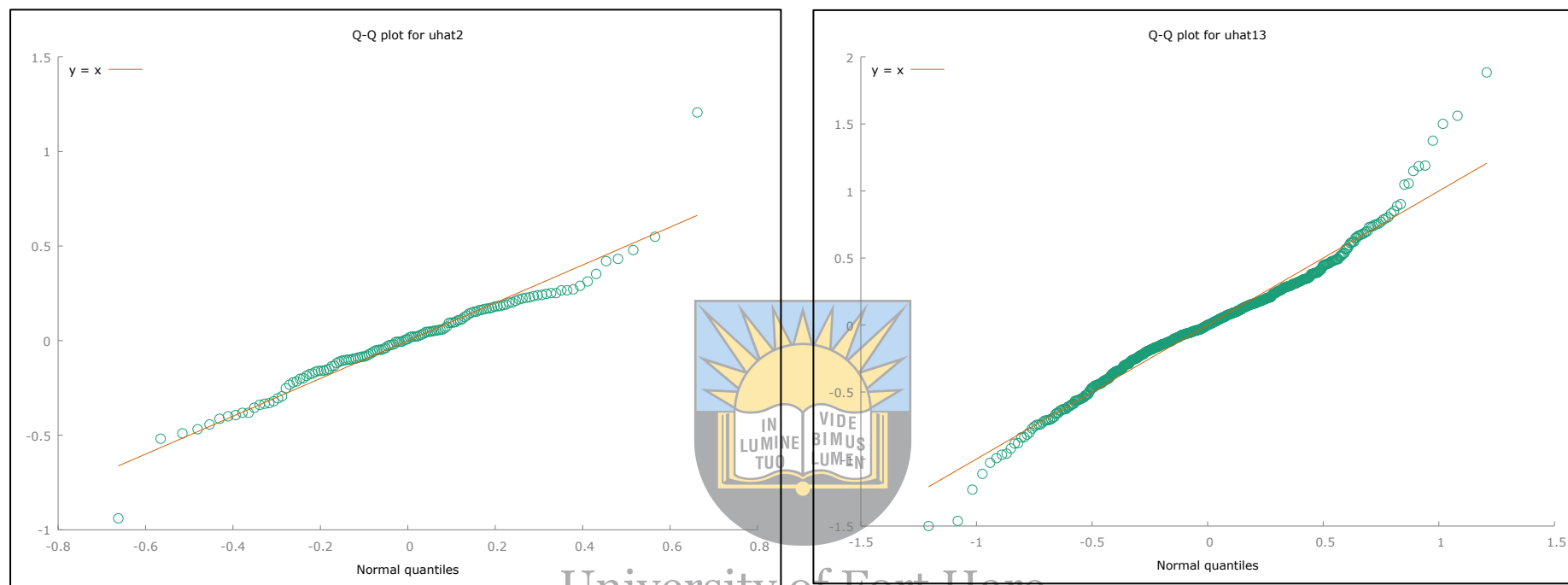


Figure 4.21: Q-Q plots for logarithmic functional forms for provincial-level data (left) and district-level data (right)

Henceforth on the partial logarithmic functional form versions are reported.

The question remains however which panel estimator to use, in particular whether to use the fixed effects or random effects approach. As indicated in Chapter Three, the approach taken was to use the Hausman Test. For both the provincial-level data and district-level data, each model was run twice, first with the fixed effects estimator, and again with the random effects estimator.

Hausman Tests were conducted for pairs of fixed effects and random effects regressions, in each instance leading to the conclusion that the fixed effects version is more consistent and should therefore be used in preference to the random effects version. For the specific case of the pair of regressions shown above, for instance, the p value for the Hausman Test was 1.17×10^{-23} , leaving little doubt that the fixed effects model should be preferred. Thus, only the results of the fixed effects models are reported here; this is the case for both the provincial-level and district-level regressions.



4.4.2 Province-level analysis

The results for a fixed effects model based on provincial-level data are presented in Table 4.5 below. The table reports the results for 8 different regressions, where each column relates to one regression, including the estimated slope coefficients, their respective significance levels, and their respective standard errors (in brackets). The bottom four rows show: the number of observations; the share of the sample that is unbalanced; the LSDV R-squared; and the Within R-squared. The share of the sample that is unbalanced is defined here as the percentage of observations in the dataset that deviate from the presumptive underlying distribution or pattern. When there are not observations for every time period for all cross-sectional units, the dataset is regarded as unbalanced. The LSDV R-squared refers to the R-squared value that is derived from a model that uses the LSDV approach and contains individual fixed effects. It estimates the extent to which of the dependent variable's overall variation can be accounted for by each of the independent variables and each of the individual fixed effects. However, while accounting for the variation between groups or individuals, the Within R-squared measures the percentage of the dependent variable's variance that can be explained by the independent variable(s) within each group or individual.

Only estimated slope coefficients that are statistically significant at the 10% level or below are discussed.

Starting with the explanatory variables that are common to all the models, Table 4.2 reveals that the estimated coefficient on the logarithm of agricultural gross value added (“I_AVApH”) has the expected positive sign in all the regressions, and it is statistically significant at the 1% level. The positive sign implies that, as per the net present value approach, higher returns in agriculture make agricultural land more valuable, thus contributing to an increase in the average price of land. The estimated slope coefficient on the real interest rate variable (“RIRATE”) is negative for all of the presented regressions, as one would expect, moreover they were all statistically significant at the 1% level. Sherrick (2018) notes that rising interest rates may put downward pressure on farmland values. Rising interest rates put downward pressure on farmland prices for two reasons. First, higher interest rates increase the financing costs of land purchases, making it more expensive to debt finance farmland. Second, higher rates signal higher returns on alternative investments, thereby making alternative investments more attractive than farmland (Schnitkey, 2016).

The last of the common explanatory variables is population density (“PopDens”), which is positively related to farmland prices for all models at the 1% significance levels. As indicated in Chapter Two, population density commonly features in both the net present value approach and hedonic pricing approach to farmland price modelling. The logic is that the higher the population density, the greater the conversion potential of farmland to alternative, more remunerative uses, such as residential or commercial development (Souders, 2016).

Table 4.5: Fixed effects model results for the province-level data (depvar = l_Apphmakt)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
constant	8.6539*** (0.1676)	9.1031*** (0.1519)	8.7141*** (0.1822)	9.1310*** (0.5560)	8.6988*** (0.1783)	9.1047*** (0.1526)	8.6920*** (0.1784)	9.0830*** (0.1538)
l_AVApH	1.5883*** (0.2718)	1.3252*** (0.2388)	2.0632*** (0.2720)	1.5605*** (0.2202)	1.9841*** (0.2738)	1.5733*** (0.2220)	1.9372*** (0.2634)	1.4756*** (0.2147)
RIRATE	-0.0614*** (0.0224)	-0.1262*** (0.0200)	-0.0792*** (0.0230)	-0.1344*** (0.0193)	-0.0799*** (0.0227)	-0.1328*** (0.0192)	-0.0711*** (0.0225)	-0.1274*** (0.0190)
PopDens	0.0038*** (0.0010)	0.0023** (0.0009)	0.0037*** (0.0011)	0.0021** (0.0009)	0.0038*** (0.0011)	0.0023** (0.0009)	0.0033*** (0.0011)	0.0019** (0.0009)
TransRestn	0.0090** (0.0037)	0.0069** (0.0034)						
TransRestn_1		0.0013 (0.0034)						
TransNonPLAS	-0.0062*** (0.0014)	-0.0034* (0.0019)						
TransNonPLAS_1		-0.0006 (0.0018)						
TransPLAS	0.0017 (0.0019)	-9.14e-5 (0.0016)						
TransPLAS_1		0.0010 (0.0018)						
ValRestn			3.09e-10* (1.76e-10)	1.56e-10 (1.40e-10)				
ValRestn_1				3.06e-10** (1.35e-10)				
ValNonPLAS			-7.10e-10* (7.16e-10)	-1.15e9* (6.18e-10)				
ValNonPLAS_1				-2.34e-11 (6.22e-10)				
ValPLAS			4.65e-10 (3.02e-10)	1.21e-11 (2.37e-10)				
ValPLAS_1				2.44e-10 (2.62e-10)				
HaRestn					2.64e-6 (1.90e-6)	8.98e-7 (1.49e-6)		

HaRestn_1						2.99e-6** (1.49e-6)		
HaNonPLAS					-2.29e-6** (1.04e-6)	-1.48e-6* (8.26e-7)		
HaNonPLAS_1						-8.03e-7 (8.02e-7)		
HaPLAS					3.19e-6** (1.48e-6)	7.12e-7 (1.22e-6)		
HaPLAS_1						1.07e-6 (1.29e-6)		
RatioRestn							1.0703** (0.5048)	0.5167 (0.4016)
RatioRestn_1								0.9121** (0.3924)
RatioNonPLAS							-1.1360** (0.5285)	-0.7244 (0.4798)
RatioNonPLAS_1								-0.2730 (0.4380)
RatioPLAS							0.8144** (0.3800)	0.1695 (0.3082)
RatioPLAS_1								0.3580 (0.3385)
Observations	144	135	144	135	144	135	144	135
%unbalanced	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
LSDV R-squared	0.86	0.91	0.84	0.91	0.85	0.91	0.85	0.91
Within R-squared	0.61	0.71	0.55	0.69	0.56	0.69	0.57	0.70

We proceed to the discussion of the non-common explanatory variables, all of which have to do with land reform.

Models 1 and 2 entertain the possibility that farmland prices are sensitive to the numbers of land reform transactions in restitution (“TransRestn”) and in both pre-PLAS redistribution projects (“TransNonPLAS”) and PLAS redistribution project (“TransPLAS”). The inclusion of one-period lag versions of these variables in Model 2 (i.e. “TransRestn_1”, “TransNonPLAS_1” and “TransPLAS_1”) is premised on the idea that, to the extent land reform may have an effect on the farmland market, it may not necessarily be entirely a contemporaneous one, i.e. there could possibly be a residual influence. From these two regressions, the estimated slope coefficients on the “TransRestn” variable are positive and significant at the 5% level, suggesting that the more numerous are restitution projects in a province, the higher the market price in that same year. At the same time, the estimated slope coefficients on “Non-PLAS” forms of land redistribution reveal a negative association between numbers of redistribution projects and farmland prices; the finding is significant at the 1% level for Model 1, and at the 10% level for Model 2. There is no suggestion from the results of these two models that past land reform activity has implications for farmland market prices, i.e. none of the lagged explanatory variables is statistically significant at any meaningful level.

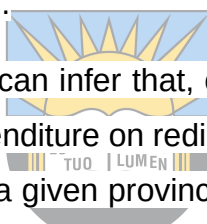


To illustrate the meaning of the statistically significant land reform variables, controlling for farm income, interest rates, population density, and the number of redistribution projects effected, an additional restitution project in a given province in a particular year, is associated with an increase in the market price of land of 0.90% in the case of Model 1, or 0.69% in the case of Model 2 (i.e. while also controlling for lag values). Meanwhile, controlling for farm income, interest rates, population density, and the number of restitution and PLAS projects effected, an additional redistribution project other than PLAS in a given province in a particular year, is associated with a decrease in the market price of land of 0.62% (Model 1) or 0.34% (Model 2). These are non-trivial impacts; one should not underestimate the significant relationships that exist between land reform initiatives and land prices.

The average of within R-squared is 0.64 and the average of LSDV R-squared 0.88 for the fixed effects model. A 0.64 within R-squared may indicate a comparatively good

model fit. In the context of the fixed effects model, an LSDV R-squared of 0.88 indicates a strong relationship between the independent variables and the dependent variable.

The next pair of regressions, namely Models 3 and 4, tests the proposition that perhaps the amount of money spent on the acquisition of land for restitution (“ValRestn”) and different varieties of redistribution (“ValNonPLAS” and “ValPLAS”), as well as their lagged values (as per Model 4), are related to farmland market prices. In Model 3, the only significant land reform variable is the amount of money spent on restitution (“ValRestn”), which is significant at the 10%, suggesting that the more money spent on restitution land, the higher are farmland prices in that province and in that year. For Model 4, it is the previous year’s expenditure on restitution land that is positively associated with farmland prices (significant at the 5% level), while current expenditure in non-PLAS redistribution land is negatively associated with farmland prices (significant at the 10% level).



From the results for Model 3, one can infer that, controlling for farm income, interest rates, population density, and expenditure on redistribution, an additional expenditure of R1 million on land restitution in a given province in a particular year, is associated with a 0.031% increase in the market price of land in that same year. This may seem like extremely modest effect, but one should bear in mind that during the period 2002 through 2017, there were five years in which expenditure on restitution land exceeded R2 billion nationally, with some provinces having expenditures in the hundreds of millions. From Model 4, an additional expenditure of R1 million on land restitution land is associated with a 0.036% increase in the market price of land in the following year, while at the same time, an additional expenditure of R1 million on land redistribution other than PLAS is associated with a 0.12% *decrease* in the market price of land in the same year.

In Models 5 and 6, land reform features as hectares of restitution land (“HaRestn”) and redistribution land (“HaNonPLAS” and “HaPLAS”) acquired in a particular province in a given year, as well as in the previous year (Model 6).

The two models highlight somewhat different aspects of the relationship between hectareage of land reform land and farmland markets prices. The results for Model 5 indicate once again that redistribution other than PLAS is negatively associated with

farmland prices (at the 5% significance level), while PLAS itself is positively associated with farmland prices (again at the 5% significance level). Meanwhile, in Model 6, the extent of non-PLAS redistribution is again negatively associated with farmland prices (at the 10% significance level), while as with Model 4, restitution in one year is positively associated with farmland prices in the following year, albeit this time in terms of hectareage.

According to these results:

- an increase in a particular province in a particular year of 1000 hectares of land acquired for restitution is associated with an increase in the market price of farmland of 0.3% in the following year, holding constant farm income, interest rates, population density, and the extent of redistribution (Model 6).
- an increase in a particular province in a particular year of 1000 hectares of land acquired through the redistribution programme – excluding via PLAS – is associated with a decline in the market price of farmland of 0.15% (Model 6) to 0.23% (Model 5), holding constant farm income, interest rates, population density, and the extent of restitution and PLAS-based redistribution; and
- an increase in a particular province in a particular year of 1000 hectares of land acquired through PLAS is associated with an increase in the market price of farmland of 0.32% (Model 6), holding constant farm income, interest rates, population density, and the extent of restitution and redistribution other than PLAS.

The last two models consider the possibility that farmland market prices are sensitive to the hectareage of land acquired via land reform in a given province in a particular year, relative to the total number of hectares transacted in that province and year. Models 7 and 8 include three ratio variables, one each for the share of hectareage transacted via restitution (“RatioRest”), redistribution other than PLAS (“RatioNonPLAS”), and PLAS-based redistribution (“RatioPLAS”). Model 8 also includes lagged versions of these variables (i.e. “RatioRest_1”, “RatioNonPLAS_1” and “RatioPLAS_1”). The results for Model 7 suggest that farmland prices are positively related to restitution and PLAS, and negatively related to non-PLAS forms of redistribution; each of the estimated slopes is significant at the 5% level. For Model 8 only one of the land reform variables is significantly, namely the coefficient on the

lag value of the ratio for restitution, which is positive and statistically significant at the 5% level.

Given that the ratio variables by their nature can have a maximum value of 1, the approach to the interpretation of the estimated slope coefficients is to consider the implications of an increase in the ratio of 0.1, e.g., as though asking what happens to land prices if the respective ratio increases from 15% to 25%. On this basis, from the results for Model 7, holding constant farm income, interest rates, population density, and the redistribution hectareage ratios, an increase in the restitution ratio of 0.1 / 10%, in a given province in a particular year, is associated with an increase in average farmland prices in that province in the following year, of 4.8%, an increase in average farmland prices of 5.3%. This a stark illustration of the potential of restitution to lead to higher land prices in the market. On the other hand, according to Model 8:

- an increase in the restitution ratio of 10%, in a given province in a particular year, is associated with a 10.7% increase in average farmland prices in that province in that same year, holding constant farm income, interest rates, population density, and the extent of land redistribution.
- an increase in the non-PLAS redistribution ratio of 10%, in a given province in a particular year, is associated with an 11.4% decrease in average farmland prices in that province in that same year, holding constant farm income, interest rates, population density, the extent of land restitution, and PLAS-based redistribution; and finally.
- an increase in the PLAS-based redistribution ratio of 10% in a given province in a particular year, is associated with an 8.1% increase in average farmland prices in that province in that same year, holding constant farm income, interest rates, population density, the extent of land restitution, and non-PLAS-based redistribution.

Meanwhile, from Model 8, what one can say is that an increase in the restitution ratio of 10%, in a given province in a particular year, is associated with a 9.1% increase in average farmland prices in that province in the following year, holding constant farm income, interest rates, population density, and the extent of land redistribution.

Notwithstanding the large number of models considered here, there are many other combinations of variables and ways of depicting land reform, that could also have been

tried. Even so, these eight regressions do allow for some reasonably robust conclusions: first, farmland prices are shown to be significantly pushed upward by the restitution programme; second, farmland prices are negatively impacted by the non-PLAS redistribution programmes; and finally, PLAS-based redistribution appears to exert an upward influence on farmland prices.

4.4.2 District-level analysis

The findings of a fixed effects model based on the district level data are presented in Table 4.6 below. Only estimated slope coefficients that are statistically significant at the 10% level or below are discussed.

The results of the explanatory variables at the district level are comparable to those at the province level. The coefficient on the logarithm of agricultural gross value added per hectare ("l_AVApH") consistently demonstrates a positive sign across all regressions and in each instance is statistically significant at the 1% level. This suggests that an increase in agricultural incomes enhances the value of agricultural land, as reflected in higher average land prices.

As one might anticipate, all the presented regressions have a negative estimated slope coefficient on the real interest rate variable ("RIRATE"), and they are all statistically significant at the 1% level. Higher interest rates result in the cost of borrowing capital to increase, which can lead to a decline in demand for farmland and a reduction in farmland values (Schnitkey et al., 2023).

Population density ("PopDens") is the last shared explanatory variable. At the 1% significance level, it shows a positive correlation with farmland prices in all of the models. Population density is often included in net present value-based models of farmland price, as discussed in Chapter Two (section 2.4.3). According to Güneralp et al. (2020), higher population densities are frequently correlated with increased demand for housing, infrastructure, and other urban amenities, which in turn can exert upward pressure on land prices in nearby farming areas.

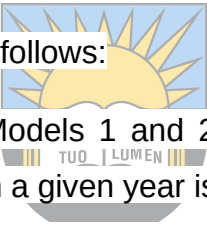
Table 4.6: Fixed effects model results for the district-level data (depvar = I_Apphmakt)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
constant	3.2244*** (0.5008)	4.4755*** (0.5969)	2.7690*** (0.5325)	4.0939*** (0.6363)	2.8711*** (0.5057)	4.1162*** (0.5867)	2.8211*** (0.5049)	3.9420*** (0.5432)
l_AVApH	0.4162*** (0.1351)	0.5601*** (0.1215)	0.4705*** (0.1440)	0.6359*** (0.1362)	0.4667*** (0.1383)	0.6251*** (0.1253)	0.4599*** (0.1444)	0.6510*** (0.1274)
RIRATE	-0.0604*** (0.0088)	-0.1217*** (0.0113)	-0.0672*** (0.0091)	-0.1305*** (0.0122)	-0.0659*** (0.0091)	-0.1291*** (0.0124)	-0.0655*** (0.0089)	-0.1304*** (0.0113)
PopDens	3.2424*** (0.4247)	2.0100*** (0.3073)	3.4306*** (0.4675)	2.0811*** (0.3395)	3.3771*** (0.4550)	2.1090*** (0.3158)	3.4032*** (0.4600)	2.1558*** (0.3245)
TransRestn	0.0160** (0.0065)	0.0083 (0.0067)						
TransRestn_1		0.0102* (0.0060)						
TransNonPLAS	-0.0116*** (0.0019)	-0.0044*** (0.0014)						
TransNonPLAS_1		-0.0068*** (0.0019)						
TransPLAS	0.0062** (0.0026)	0.0030 (0.0020)						
TransPLAS_1		0.0030 (0.0025)						
ValRestn			3.47e-10* (2.08e-10)	1.87e-10 (2.12e-10)				
ValRestn_1				2.06e-10 (2.51e-10)				
ValNonPLAS			-2.17e-10 (7.06e-10)	-5.36e-10 (5.37e-10)				
ValNonPLAS_1				-1.01e-9 (9.22e-10)				
ValPLAS			8.64e-10* (4.50e-10)	4.33e-10 (3.07e-10)				
ValPLAS_1				5.99e-10 (3.95e-10)				
HaRestn					-2.50e-6 (2.90e-6)	-3.62e-6 (2.71e-6)		
HaRestn_1						1.98e-6		

						(2.94e-6)		
HaNonPLAS					-4.10e-6** (1.54e-6)	-3.56e-6*** (1.02e-6)		
HaNonPLAS_1						2.28e-7 (1.74e-6)		
HaPLAS					4.80e-6** (2.03e-6)	2.46e-6* (1.33e-6)		
HaPLAS_1						2.30e-6* (1.26e-6)		
RatioRest							0.1693 (0.1542)	0.0972 (0.1619)
RatioRest_1								0.0293 (0.1414)
RatioNonPLAS							-0.0144 (0.2247)	-0.0179 (0.2214)
RatioNonPLAS_1								-0.2110 (0.2071)
RatioPLAS							0.4139*** (0.1492)	0.3377* (0.1738)
RatioPLAS_1								-0.0450 (0.1856)
Observations	730	685	730	685	730	685	730	680
%unbalanced	0.82%	0.72%	0.82%	0.72%	0.82%	0.72%	0.82%	1.44%
LSDV R-squared	0.84	0.88	0.84	0.87	0.84	0.87	0.84	0.87
Within R-squared	0.49	0.53	0.46	0.51	0.47	0.51	0.47	0.52

Moving on to the land reform variables, the approach is similar to that applied above in respect of the regressions based on provincial-level data. Thus as before, Models 1 and 2 consider the possibility that farmland prices are sensitive to the numbers of land reform transactions (“TransRestn”, “TransNonPLAS” and “TransPLAS”), while Models 3 and 4 measure the extent of land reform in terms of amount of money spent (“ValRestn”, “ValNonPLAS” and “ValPLAS”), Models 5 and 6 consider the hectareage of land reform land in a particular area and year (“HaRestn”, “HaNonPLAS” and “HaPLAS”), and Models 7 and 8 consider the hectare of land acquired via restitution and redistribution relative to the total hectareage of land acquired (“RatioRest”, “RatioNonPLAS”, “RatioPLAS”) Also as before, what distinguishes the second model in a pair to the first (e.g. Model 2 versus Model 1, Model 4 versus Model 3, etc.) is that the second model also includes the PLAS dummy variable (“PLAS”). Finally, each land reform-related explanatory variable is complemented by its own one-year lag value (“Transrestn_1”, “Valrestn_1”, etc.).

The results can be summarised as follows:

- 
- The fitted regressions for Models 1 and 2 suggest that the market price of farmland in a given district in a given year is positively related to the number of restitution projects in that district in both the current and previous year. The estimated slope coefficient on the “TransRestn” variable is significant at the 5% level (Model 1), while the estimated slope coefficient on “TransRestn_1” is significant at the 10% level (Model 2). There is a strong negative relationship between the other programmes of redistribution besides PLAS (“TransNonPLAS”), which is statistically significant at the 1% level (Model 1). The number of transactions made through the PLAS programme is statistically significant at the 5% level (Model 1).
 - None of the land reform variables is statistically significant in Model 4, however from the results for Model 3, it also seems that the amount of money spent to acquire land for PLAS farms in a given district in a given year, is positively related to farmland prices (Model 3). The estimated slope coefficient on the “ValPLAS” variable is significant at the 10% level (Model 3).
 - Land reform is represented in Models 5 and 6 as hectares acquired in a specific district within a specific year for restitution (“HaRestn”) and both types of

redistribution (“HaNonPLAS” and “HaPLAS”). The estimated slope coefficient on the “HaNonPLAS” and “HaPLAS” variables are significant at the 5% level (Model 5), while the estimated slope coefficient on “HaNonPLAS” is significant at the 1% level in Model 6. Both “HaPLAS” and “HaPLAS_1) are significant at 10% level. These two models indicate that “HaNonPLAS” has a negative relationship with farmland prices, i.e. it influences the prices of farmland to decrease, in contrast, “HaPLAS” is positively associated with farmland prices i.e. it appear to exert an upward pressure on the price of farmland.

- The final two models take into account the potential for farmland market prices to be influenced by the hectares of land obtained through land reform in a specific district at a given year, in relation to the share of total hectares transacted in that district and year owing to land reform. Here the results are somewhat different than in the provincial-level; only “RatioPLAS” is significant in both (Models 7 and 8). In Model 7 the slope coefficient on “RatioPLAS” has a positive relationship which is significant at 1% level, whereas in Model 8 it is statistically significant at the 10% level.

The interpretation of the statistically significant estimated slope coefficients is summarised below. The *ceteris paribus* conditions are not spelled out, but as always would refer to the holding constant of the other explanatory variables present in that particular model.

Table 4.7: Impact of land reform programme on farmland prices at district-level

Model	Impetus	Influence on average farmland prices
Model 1	1 additional restitution project in district i in year t	+1.60%
	1 additional non-PLAS redistribution project in district i in year t	-1.16%
	1 additional PLAS redistribution project in district i in year t	+0.62%
Model 2	1 additional restitution project in district i in year t-1	+1.02%
	1 additional non-PLAS redistribution project in district i in year t	-0.44%
	1 additional non-PLAS redistribution project in district i in year t-1	-0.68%

Model 3	Additional expenditure of R1 mn on land for PLAS in district i in year t	+0.09%
Model 5	Additional acquisition of 1000 hectares of land for non-PLAS redistribution in district i in year t	-0.41%
	Additional acquisition of 1000 hectares of land for PLAS redistribution in district i in year t	+0.48%
Model 6	Additional acquisition of 1000 hectares of land for non-PLAS redistribution in district i in year t	-0.36%
	Additional acquisition of 1000 hectares of land for PLAS redistribution in district i in year t	+0.25%
	Additional acquisition of 1000 hectares of land for PLAS_1 redistribution in district i in year t	+0.23%
Model 7	Share of land acquired in district i in year t owing to PLAS increased by 10%	+4.14%
Model 8	Share of land acquired in district i in year t owing to PLAS increased by 10%	+3.34%

4.5 CONCLUSION TO THE CHAPTER

This chapter has presented the results and analysis for the trends of the farmland prices and hectares under land market in South Africa. It also illustrated the trends of land values and hectareage under the land reform programme. The results show that average amounts of money paid for land under the land reform programme have diverged significantly from the trend for the land market. However, the average price of redistribution programme is significantly below the general market price of land, while the average price of restitution land is slightly above the general market price of land. The findings revealed that the redistribution programme “NonPlas” has a negative relationship with farmland prices, whereas the PLAS programme has a positive relationship. In other words, “NonPlas” programme led to a decline in land prices. On the other hand, restitution programme has a positive relationship with farmland prices. Therefore, restitution and PLAS programme may have an effect for land prices to increase or land to be expensive. The next chapter provide discussion of the results, conclusion and make some recommendations.

CHAPTER FIVE: SUMMARY, DISCUSSION, AND RECOMMENDATIONS

5.1 SUMMARY

This study sought to examine whether and in what manner redistributive land reform in South Africa influences the land market, above all in order to appreciate whether or not that influence has the effect of undermining land reform itself. In exploring the impact of land reform on the land market, this study seeks to add to the available literature, in particular the literature regarding the implications of the willing buyer / willing seller approach for redistributive land reform.

The first objective of this study was to explore the trends over time in agricultural land prices and market volumes from 2002 to 2017. Land prices mirrored housing prices closely from 2002 to 2006, but after that they began to rise more quickly, seemingly more affected by the recovery in net farm income from 2006. However, quite strangely, the market volumes (i.e. hectarages) of farmland transactions were decreasing dramatically over this period, even while real farmland prices continued to increase. While the reason for this juxtaposition is difficult to understand and therefore remains a bit unsettling, it is not unique to South Africa.

The second objective was to identify the trends over time in prices paid and hectares acquired by the land reform programme. The descriptive results also presented the comparison of land market prices with prices paid for land for restitution and redistribution projects. The average payments made for land under land reform frequently deviate significantly from the general land market trend. However, there are significant differences between the two main elements of redistributive land reform, namely restitution and redistribution. The restitution programme in the observed provinces and districts tends to be on a par with, or sometimes below, market prices, whereas prices paid for restitution land tends to be higher than market prices. The paired two-sample t-test was used to compare the average, inflation-adjusted price of land reform land to the land market and test statistically whether average prices of land reform land actually differ from those of the land market. The average price of redistribution land in South Africa is generally less than the average market price of land, whereas the average price of restitution land is higher than the general market price of land.

The last objective was to examine the influence of different aspects of the land reform programme on the land market in South Africa. These relationships were examined using panel data and econometric models suitable for panel data, applied to a model based on – but extending – the net present value approach.

Two panel data sets were assembled and analysed, both covering the period 2002 through 2017; for the first, provinces served as the cross-sectional units, while for the other the cross-sectional units were districts (in particular districts with at least some land market activity as picked up by the Deeds Office).

As expected, the results obtained from the fixed effects model indicate that agricultural gross value and population density exert an upward pressure on real farmland prices, while the real interest rate had the expected negative sign. More importantly given the aims of this study, the results further demonstrate that the land restitution programme and PLAS-based redistribution tend to result in higher farmland prices, whereas non-PLAS redistribution projects had the opposite effect.

5.2 DISCUSSION



The fact that, according to the econometric analysis, different components of the land reform programme affect the farmland market in contrasting ways is a major finding of this study. One implication is that those critical of the so-called ‘market-based approach’ to redistributive land reform on the grounds that land reform itself influences the market in ways that undermine land reform (quite apart from other criticisms of the market-based approach), are justified in their concerns.

However, the fact that non-PLAS redistribution appears to bear a completely different relationship to the farmland market, suggests that there is more to the story. From a policy perspective, this is important notwithstanding the fact that, at present, South Africa’s land redistribution programme is based entirely on PLAS, i.e. so-called ‘non-PLAS redistribution’ was long ago phased out. The challenge, however, is to understand why and how these land reform programmes appear to affect farmland prices in such different ways.

Unfortunately, it is not possible at this stage to answer this question definitively. The following, somewhat speculative answers are offered.

First, why the upward pressure exerted by land restitution and PLAS-based redistribution on farmland prices? One conjecture could be that restitution and PLAS lead to positive economic benefits such as improved agricultural productivity or infrastructure development, which in turn could contribute to an overall improvement in the economic environment. Higher farm incomes would lead to higher land prices as per the logic of the net present value approach, while a broader positive economic impact would attract investors and therefore demand for land. The challenge with this interpretation is that, although there are certainly instances of land reform resulting in higher production and thus farm incomes, there is little evidence to suggest that this is generally the case.

Rather, the upward pressure exerted by restitution and PLAS-based redistribution on farmland prices appears to be in keeping with the mechanism underlying the concern of critics of land reform, and as per the conceptual framework offered above, namely that land reform puts upward pressure on land prices in terms of a conventional demand / supply framework. That is, these forms of land reform constitute exogenous increases in land demand that forces the market equilibrium price high. However, this interpretation needs to be qualified. One curious observation is that, from the 'visual inspection' of farmland prices in relation to land reform in districts that have experienced especially large amounts of land reform (see section 4.3.3), farmland market prices appear to be sensitive to increases in the number and share of hectares acquired via land reform, but not to prices paid for land reform land. Thus while it is interesting to note that government appears to pay more than the market price for restitution land, it would appear that it is not these high prices that influence the land market, but rather the (number of) hectares themselves. One interpretation is that the underlying mechanism is better understood not as a rightward shift in the demand curve, but as a leftward shift of supply, meaning there is less land available for purchase by private buyers outside of the land reform programme. In other words, an increase in land reform in an area over the course of a year or two starves the market of available land, such that private buyers bid up the price of land.

Another important qualification, however, is that the upward pressure on market prices exerted by restitution and PLAS-based redistribution, is not enduring, rather it appears to dissipate quickly. This is evident in the district graphs mentioned above, as well as by means of the generally desultory results for the lags of the land reform variables

included in every second econometric model. This would seem to temper the concern one might have about the extent to which land reform itself increases the cost of land reform. This effect is there, but apparently not in the form of some kind of ongoing ‘contamination’. This supports the idea that it is not the amount of money spent per hectare by government on land reform land that pushes up land market prices, for which the underlying mechanism would presumably be an influence on the reservation prices of potential land sellers in an area, which one would expect to linger for a while.

But now what about non-PLAS redistribution? That is, why does it have a negative relationship with farmland market prices? One interpretation could be that this effect is in keeping with another mechanism highlighted in the study’s conceptual framework, namely the NIMBY effect. Such an interpretation should not be dismissed, given the copious evidence from around the world as to the depressing effects of changes in one’s local area due to negatively-perceived changes – including an influx of undesirable neighbours – on local real estate markets.

On the other hand, why would non-PLAS redistribution be so different from PLAS-based redistribution? In fact there are two very significant distinctions between PLAS and non-PLAS redistribution that might help us understand this difference. The first is that, compared to the SLAG and even the LRAD approaches to redistribution (i.e. the main two forms of non-PLAS redistribution that existed between 1994 and 2009), PLAS beneficiaries are very ‘thin on the ground’, literally meaning that the ratio of beneficiaries to hectares is far lower (PLAAS, 2016: 26). In other words, there is reason to suppose that the NIMBY effect was more acute during the non-PLAS era of South Africa’s land redistribution programme relative to the PLAS era that replaced it. The second possible explanation relates to the manner of land acquisition in non-PLAS versus PLAS forms of redistribution. Under the SLAG and LRAD programmes, the amount of money that could be spent was limited by ‘grant formulae’ that had the effect of slowing down land purchases as well as tempered how much money could be spent on individual farms, or on farms in a given area at a point in time. This was one of the main reasons why PLAS was introduced in the first place, i.e. to allow government to acquire land more quickly (Jacobs et al., 2013: 41). Moreover, PLAS never introduced caps on how much money could be spent to acquire farms, perhaps because under PLAS, land acquisition and beneficiary selection were separated. Another feature of PLAS is that there was a particular effort to acquire ‘good farms’ in

order that those to whom the land was eventually allocated, would have a fair chance of success, whereas under LRAD and SLAG, the concern was often expressed that the land acquired tended to be inferior, thus ‘setting beneficiaries up for failure’. While the rationale for replacing LRAD with PLAS may well have been justified, it appears that these same changes may account for the fact that PLAS exerts a positive pressure on local land prices, at least for a brief period.

5.3 RECOMMENDATIONS FOR POLICY

Notwithstanding the need for further research (see below), this study has answered some questions in a manner that has a direct bearing on policy. Four main implications for policy are identified:

- First, the study has confirmed that relatively high amounts are spent per hectare for land restitution land and PLAS-based redistribution land. This does not automatically mean that the prices paid for PLAS and restitution land are ‘too much’ – a definitive judgement to this effect would require more information, for example an indication of the relative quality of land changing hands through different mechanisms – but there is nonetheless a strong indication. The implication is that, notwithstanding the introduction of the Office of the Valuer General, more emphasis is needed to ensure that fair prices are paid by the state. This is the case even though the study concludes that the payment of high / excessive prices are not a significant cause of land price inflation; they are nonetheless a drain on budgetary resources, which in turn comes at the expense of land reform.
- Second, the manner in which land is identified and acquired appears to make a difference. In particular, evidence was brought to bear that it the tendency of land reform to drive up land prices is not only a function of how much land is acquired, but whether that amount constitutes a large share of transactions in a particular area. (See for examples Models 7 from the province-level and district level econometric analyses, as well as the district graphs in section 4.3.3.)
- Third, to the extent the study provides evidence that the NIMBY effect is real, one wonders why the state cannot conduct land reform in a manner that takes

advantage of it. On the face of it, this is a 180 degree contradiction to the previous policy recommendation, which argued against purchasing too much land in one area over a short time. However, the argument here is not about the concentration of land acquired, but about the concentration of beneficiaries on the acquired land. Of course, such a course of action would have far reaching implications beyond land acquisition; it would almost certainly involve a return to 'pro-poor land reform', the merits of which are not explored in the present student.

- Lastly, the study argued that the underlying reason land acquisition for PLAS-based redistribution and restitution pushes market prices higher, is because they temporarily constrain the supply of land available for others to purchase. If this is the case, does it matter greatly whether government acquires land reform land via market purchases, or via expropriation? Of course, much depends on how an expropriation is conducted; but on the face of it, an expropriation undertaken in a sober, fair manner in a rule-of-law environment, could well have the same inflationary impact on the land market as if the land had been acquired via purchases.



5.4 RECOMMENDATIONS FOR FURTHER RESEARCH

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Despite the highly topical nature of the land reform and the question of how land should be acquired, there is little research on as to how land reform affects the land market or vice versa. The present study lays claim to making a meaningful contribution in this respect, but it must be acknowledged as insufficient. In the first place, even on the relatively narrow question of how land reform affects the market, one would wish for more research that either confirms, qualifies, or conclusively rejects this study's findings. The research approach could be elaborated upon in various ways, for example by extending the timeframe of the study back to 1994 and forward to a more recent end date. Another way in which the quantitative analysis could be deepened is to consider not only average price per hectare as a dependent variable, but also area transacted (e.g. per year and per district/province); our lack of understanding as what accounts for the significant decline in volumes traded is a concern, especially when one considers the possible implications for land availability. And lastly, notwithstanding the fact that the fixed effects model applied here is both appropriate and serviceable,

it has its limitations. One of these is that it is not geared to picking up on spatial contagion; that is, to the extent land reform may push the land price in an area up or down, to what extent will this effect be felt beyond that particular area?



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APPENDIX 1: NON-SOUTH AFRICAN EXAMPLES OF FARMLAND PRICES VERSUS AREA TRANSACTED

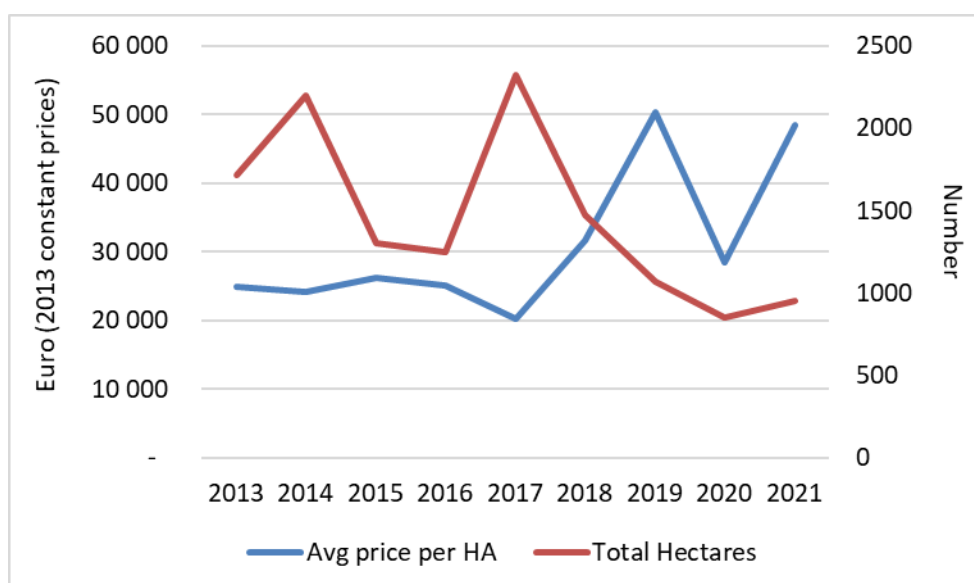


Figure A1.1: Farmland prices and area transacted for arable land in Ireland, 2012-2021

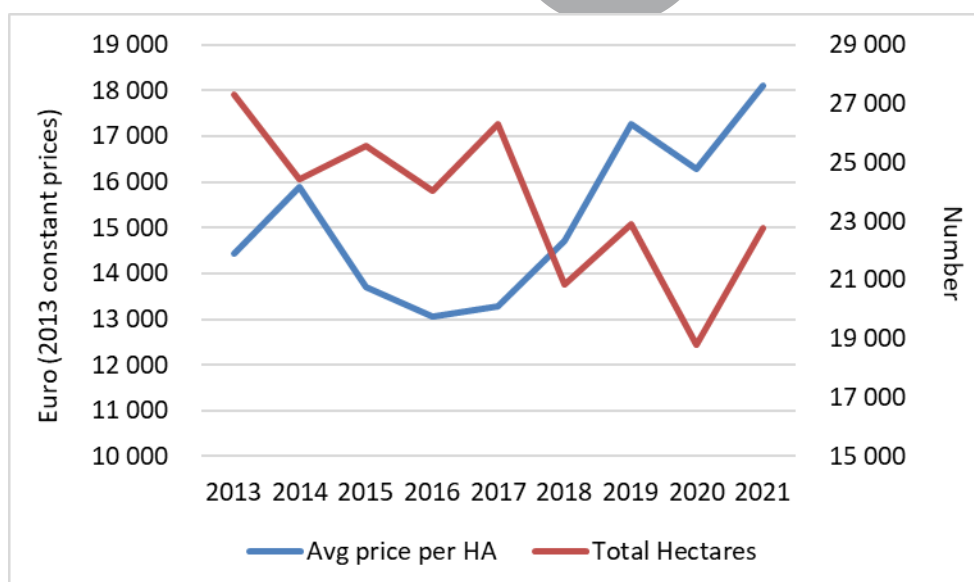


Figure A1.2: Farmland prices and area transacted for permanent grassland in Ireland, 2012-2021

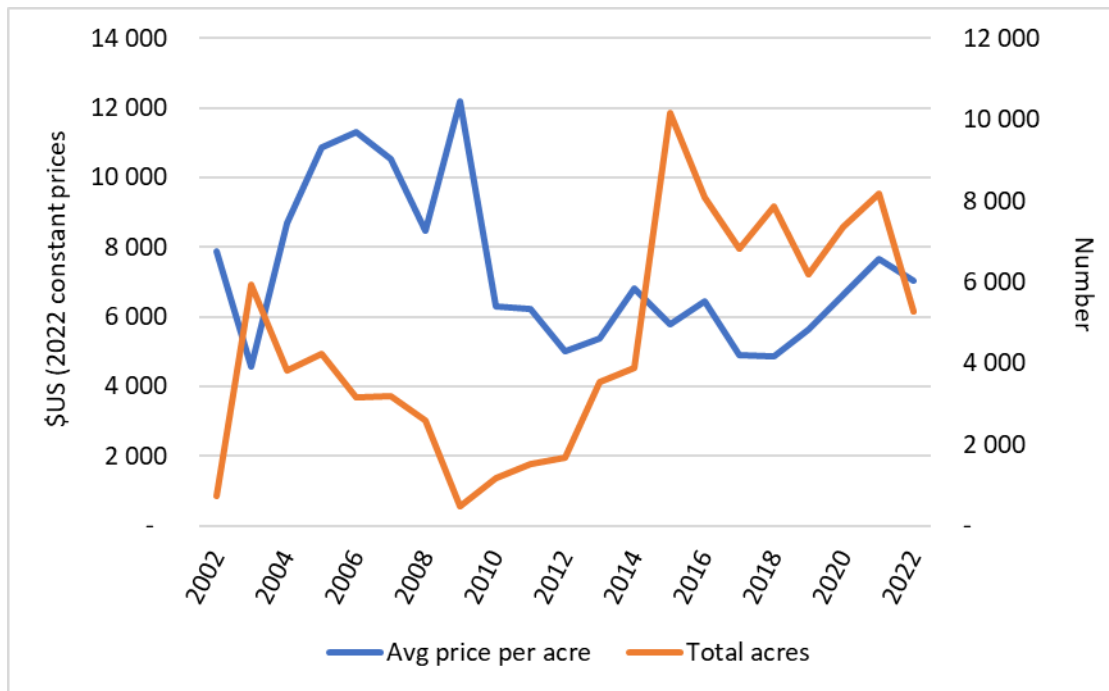


Figure A1.3: Farmland prices and area transacted for Central Virginia, USA, 2002-2022



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APPENDIX 2: PROVINCIAL TRENDS IN THE AVERAGE PRICE PER HECTARE IN FARMLAND MARKET AND FOR LAND REFORM LAND

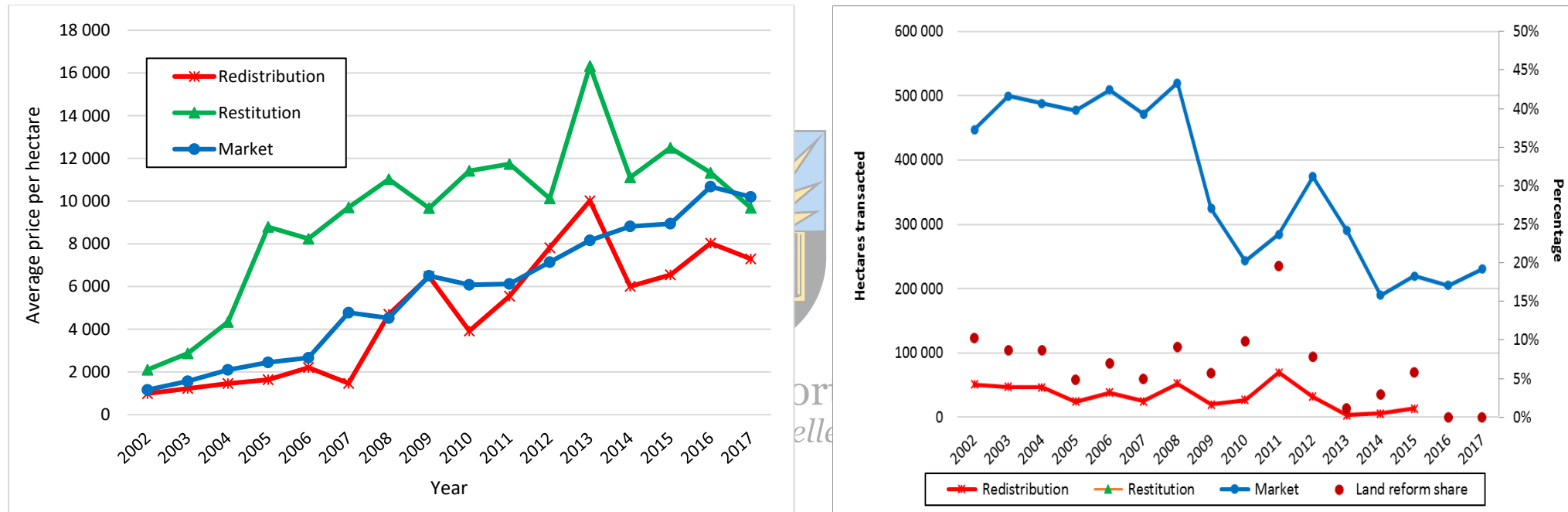


Figure A2.1: Eastern Cape

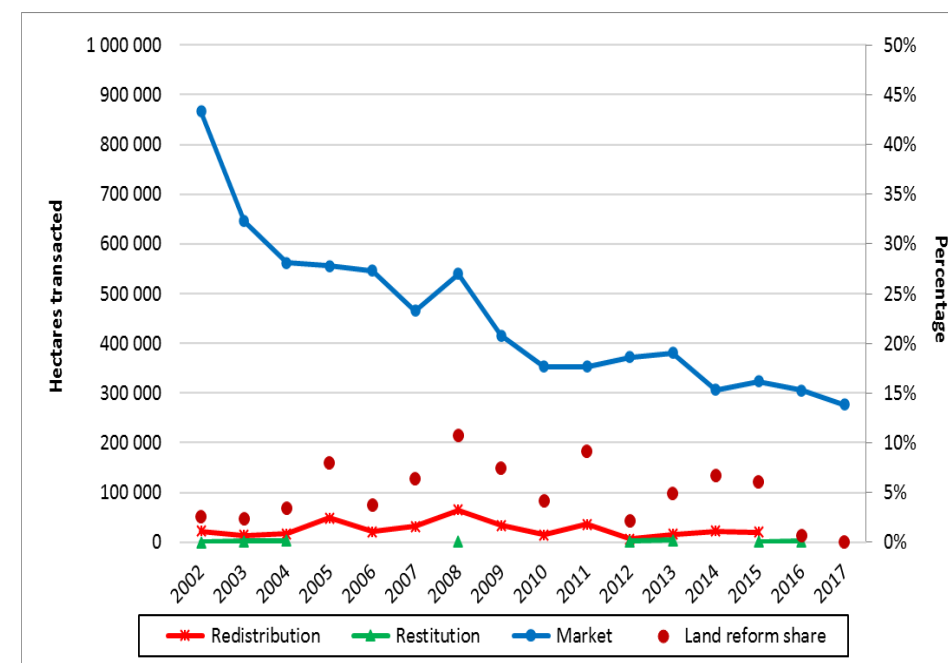
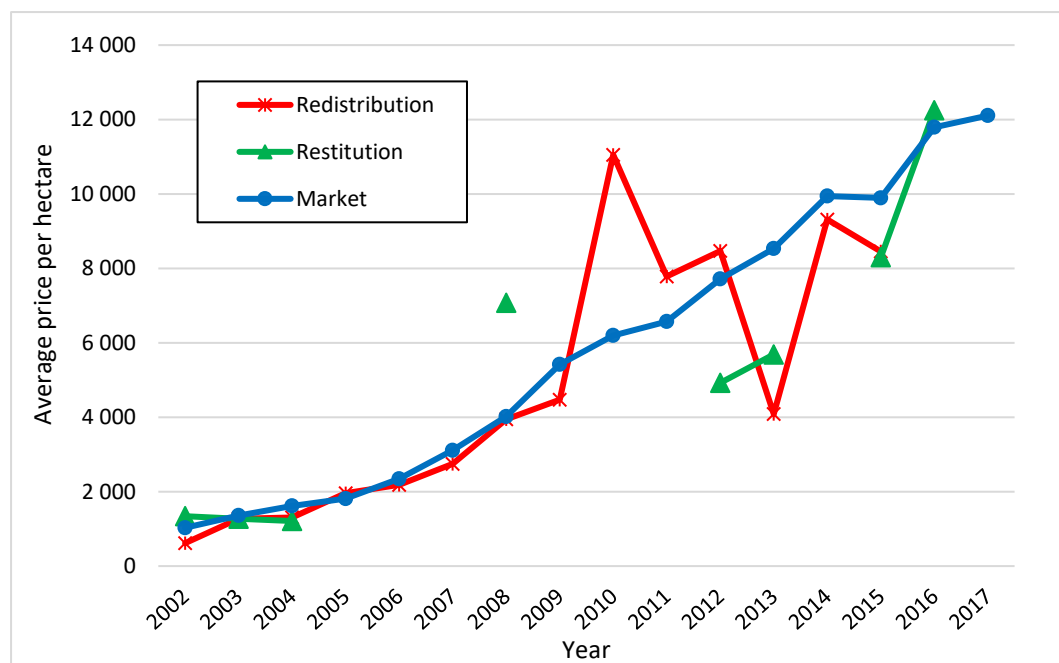


Figure A2.2: Free State

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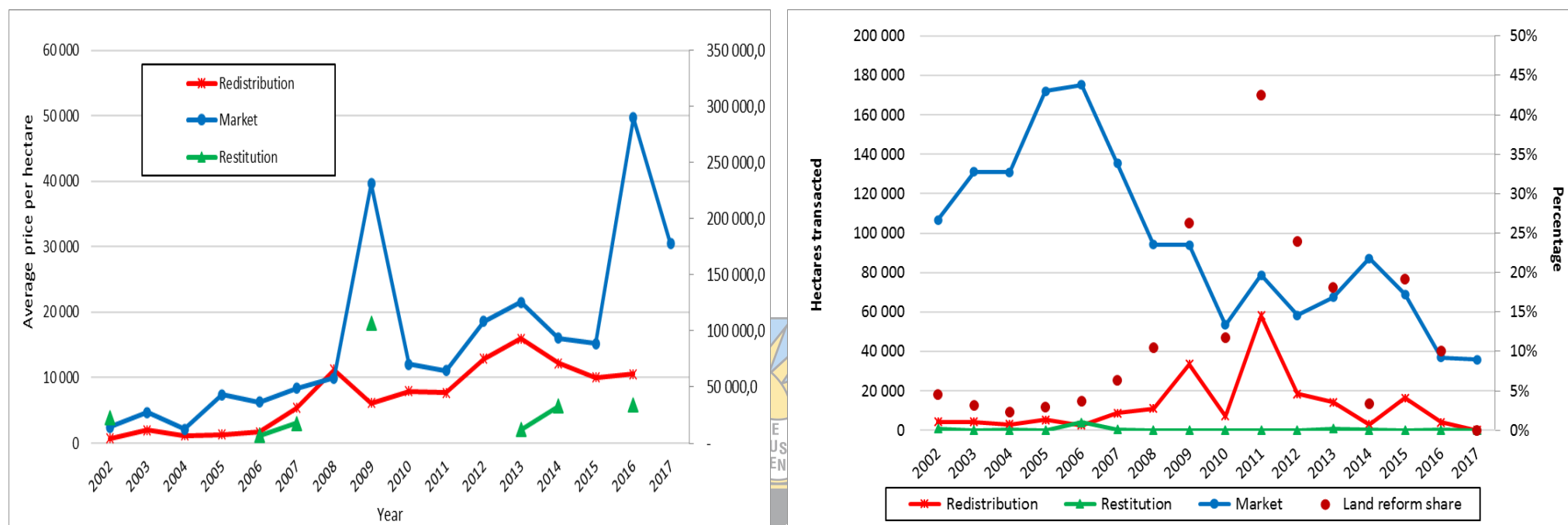


Figure A2.3: Gauteng

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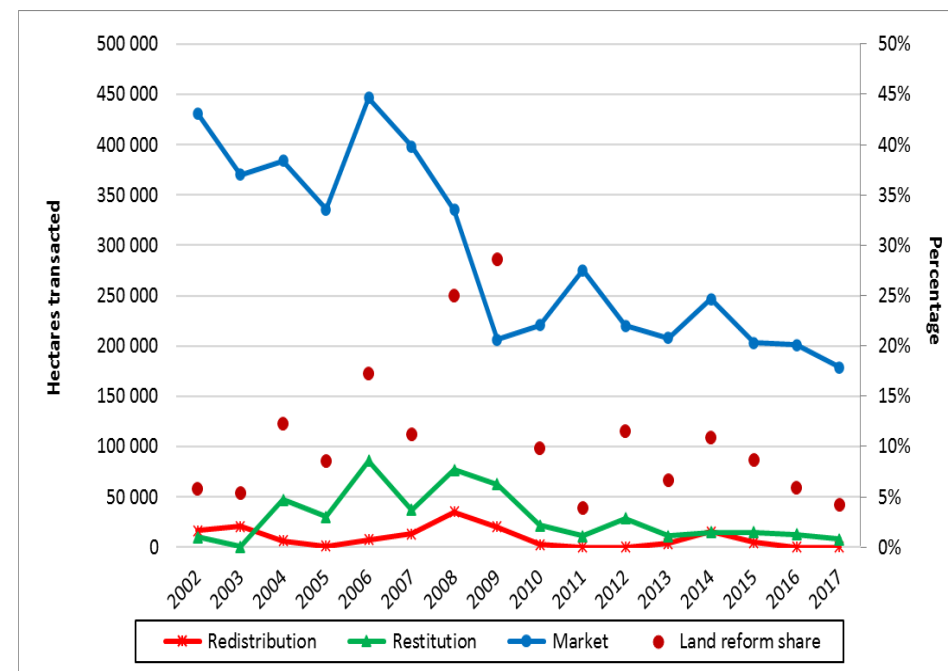
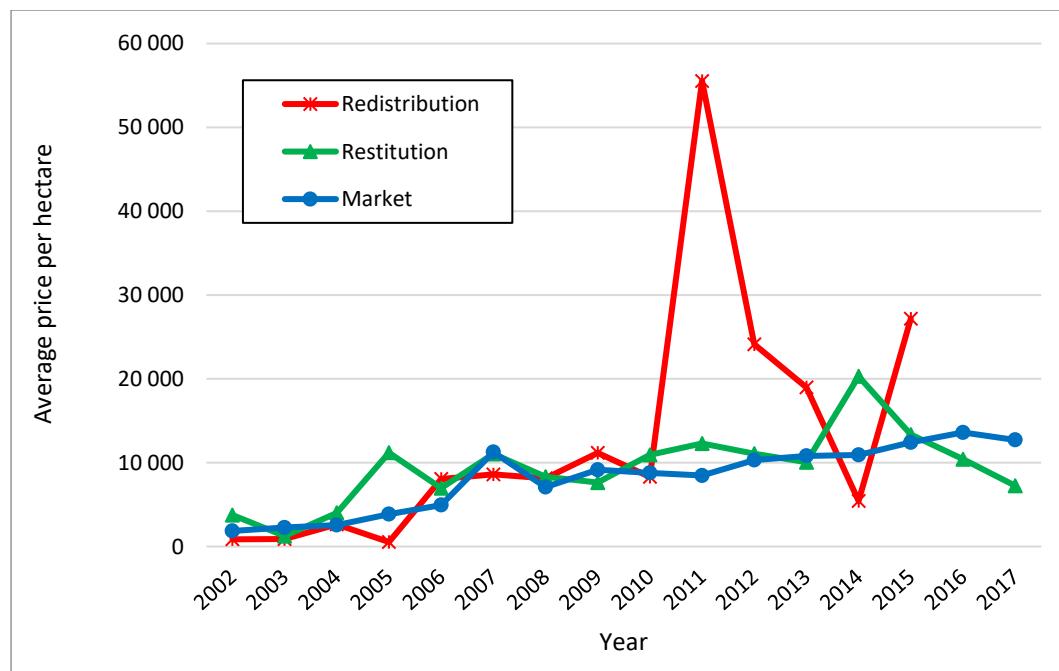


Figure A2.4: Limpopo

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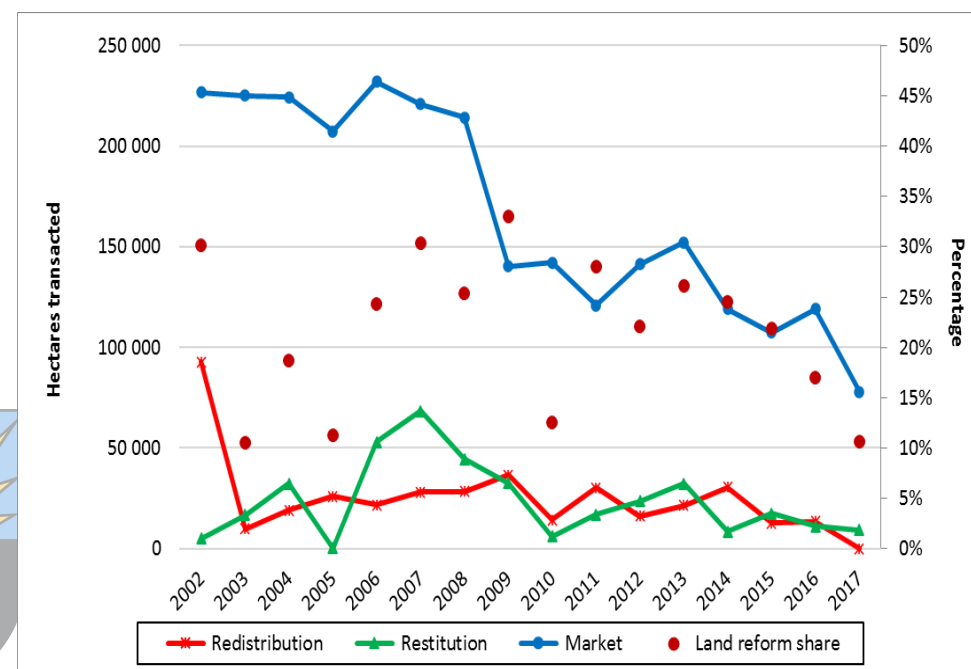
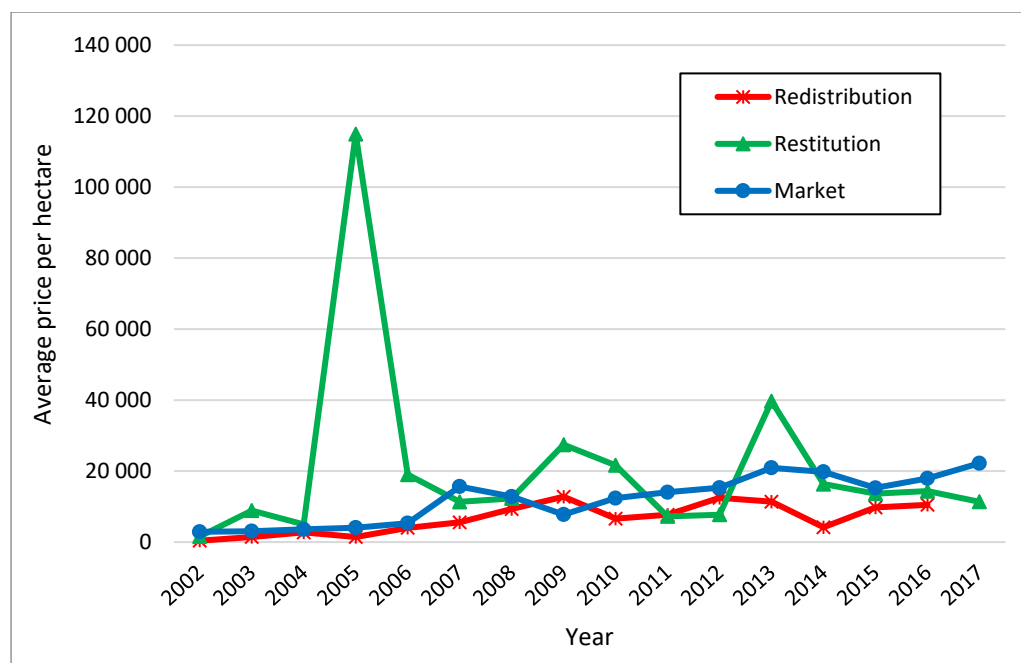


Figure A2.5: Mpumalanga

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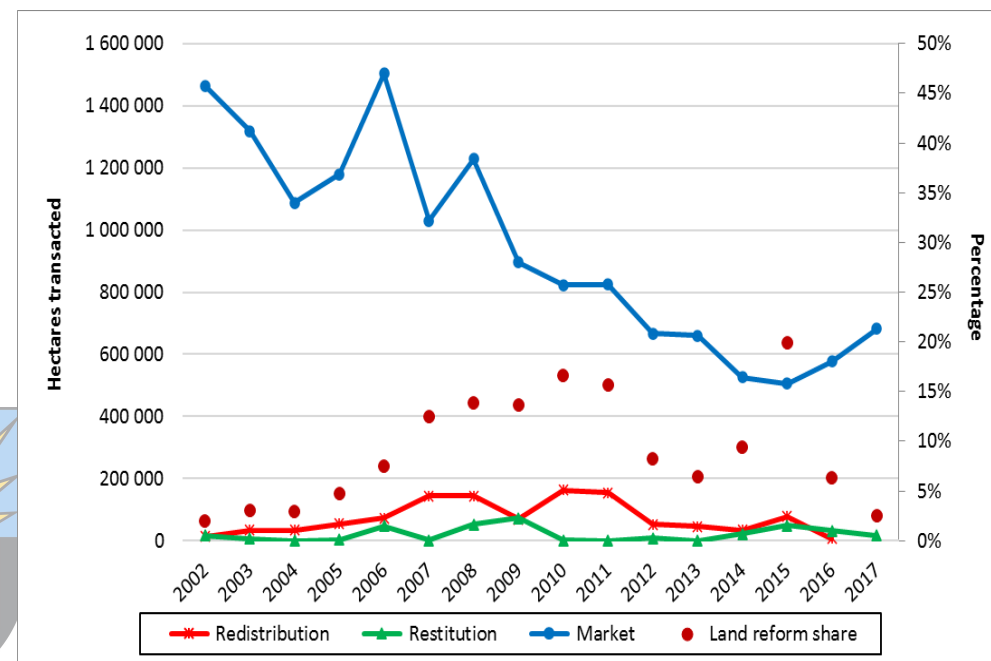
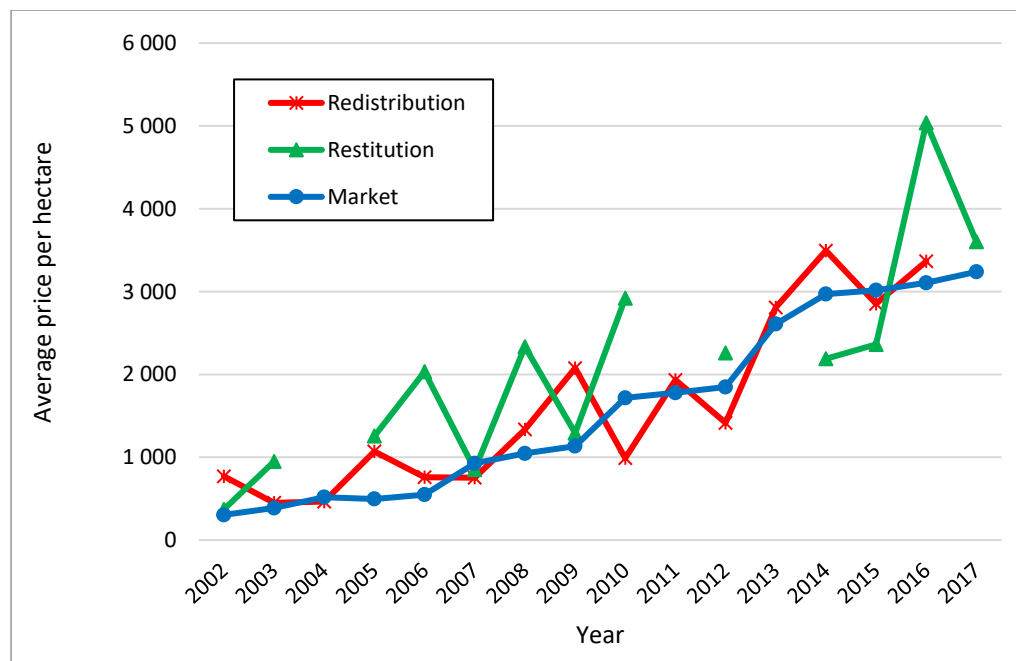


Figure A2.6: Northern Cape

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