On the role of government land information in macroeconomic policies

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Abstract

In many countries macroeconomic policy making and land administration operate independently. A review of the literature from both disciplines supports this view. The failure to include authoritative land information generated by a country’s land administration system in macroeconomic policy making can result in suboptimal governmental fiscal and monetary decisions. This is demonstrated through two case studies of the Australian context, with a focus on managing land taxes and administering interest on debt financing. A simplified empirical model is derived from the study results. The model aims to articulate and promote the important role of government land information in policy and decision-making. Practical implementation will require determination of the legal, institutional, and technical requirements of the model.

1.0 Introduction

Land administration and macroeconomic policies are key to the creation and management of national wealth. Literature reflects this (Weale, 1989; Barro, 1990; Munasinghe, 2006; Dale and McLaughlin, 1999 and Denman, 1978). However in many countries both processes operate independently and their interdependence is not reflected in literature. In the United States for instance, the financial collapse of the late 2000s that resulted in the global financial crisis (GFC) is suggested to have emanated in part from a lack of integration between the information processes of land administration and macroeconomic policy making (Roberge and Kjellson, 2009 and Buhler and Cowen, 2010).

The link between land administration and macroeconomic policy is particularly unclear in federated nations, such as Australia, the United States and India, where land administration
functions are allocated by constitutional arrangements to the state and territory governments, while macroeconomic policies are administered at central government level. In these counties, the capacity of land administration to support macroeconomic policy making is in need of new evaluation. To achieve this, existing theory and practices within the disciplines of macroeconomics and land administration are presented. The short comings of these theories in practice are demonstrated by presenting the results of two case studies from the Australian context. The outcomes of the case studies lead to the articulation of a simplified empirical model that links macroeconomics and land administration processes. The model is aimed at policy and decision makers in higher levels of national government. It aims to emphasize the necessity for seamless land administration and macroeconomic processes.

2.0 Background: The gap in theory

Economics in general shows how society attempts to allocate limited resources to meet the needs or wants of its citizens. In any economic system, markets are seen as one way of organizing economic activity, and allocating scarce resources among competing uses.

“The capitalist system is one characterised by the private ownership of the means of production, individual decision-making, and the use of the market mechanism to carry out the decisions of individual participants and facilitate the flow of goods and services in markets” (Pickersgill and Pickersgill, 1974, page 13)

Most capitalist economies today are not pure capitalist. In Australia, for instance, the majority of goods and service are produced by private enterprises. However, the government plays an important role either directly or indirectly in managing national wealth. This is considered to be a mixed capitalist economy. The governments in mixed capitalist economies attempt to maintain high levels of employment, economic stability and promote economic growth. They also regulate business activity, run welfare programs and often take measures to redistribute
income (Lane and Ersson, 2002). Macroeconomic policies are the primary tools of central
governments to manage national wealth.

A large part of macroeconomics is about land. For instance, the availability of money in the
economy, especially unrestricted mortgage financing, managed by monetary policy tools, has
a significant impact on land or property markets. Throughout modern history many property
market bubbles came from explosions in lending. The GFC saw global credit dry up and
money for loans being much harder to source. The central reserve banks of many mixed
capitalist nations reduced interest rates to record lows in order to prevent market collapse and
stimulate growth. At times the interest rates were close to zero but property markets still fell
because of the lack of money lenders. Fluctuations in interest rates play an important part in
the property market, but money must also be available for lending. Operations in the
secondary mortgage market also influence purchasing power (Carper et al, 2007).

Analysis of how property markets work is predominantly carried out in the language of
economics. However in a land or property market the product is formalised by a land
administration system that determines the type of title and land right through the tenure
system, and other functions of land value, land use and land development (Enemark, 2007).
The land administration system identifies the complex real property right that is the
foundation of formal property markets in mixed capitalist economies. This is not necessarily
reflected in general economic literature.

For instance, market economics uses the forces of supply and demand to determine the price
of goods and services being traded in the market environment. Though these general
economic assumptions apply to property markets, and to the credit markets that underpin
them, a number of factors often not quantifiable affect the market price of a property. These
include land quality, legal constraints, intended use of the land, the general state of the local
economy and other intangible factors such as people’s perception of what the land is worth (FAO, 2003). Hence, while some of these factors such as land quality can be measured by physical qualities such as soil, aspect, rainfall expectancy and location, the actual price paid in a property market transaction is what a buyer is willing to pay and a seller is willing to accept (Dale and McLaughlin, 1999). This selling price may or may not reflect the market equilibrium at the time, since for example a buyer may be willing to offer more due to her preconceptions or desires, and a seller may be willing to settle for less due to his urgent need to sell. Additionally, the supply of property and its use can be seen as fixed in the short term (Carmona, 2003). Development of property takes time and once a building is built its use remains fixed for a long time, regardless of short term fluctuations in the property market.

Property or real-estate economics endeavours to account for these unique characteristics of property markets, by linking the actions of people to their effect on the value of property. This discipline tries to apply general economic theory to the realities of real estate practices. However, property markets come from a nation’s capacity to create ‘property rights institutions’ (North and Thomas, 1973), and these are often within the domain of land administration. The formal and informal economic and political constraints are the market institutions needed for markets to run efficiently. As McMillan (2008) points out, market institutions work to limit transaction costs, that is the time and money spent locating others to transact with, comparing prices, evaluating the quality of the commodity for sale, negotiating agreements, monitoring performance and settling disputes.

Contemporary economics has evolved to better understand the role of institutions, such as individuals, agencies etc, in influencing economic behaviour. Within institutional economics, markets result from the complex interaction of various institutions. Commons (1931) introduced the idea that individual behaviour or the exchange of goods is a transaction. This was the preface for the idea of the ‘cost of market transactions’ in Coarse’s (1960) The
Problem of Social Cost, and Transaction Cost Economics by Williamson (1979). Coarse used the concept to predict when certain economic tasks would be undertaken by agencies and when they would be carried out by the market. Birner and Wittmer (2004) apply Williamson (1985)’s work on transaction costs in the public sector to study the efficiency of government structures within the context of natural resource management. Collection of information here is regarded as a transaction cost of decision making. In land or property markets, government services lower transaction costs. On a macro level, central governments in most market economies employ principles from institutional and Keynesian economics to support government management of aggregate demand in the economy. Government macroeconomic policies are intended to combat the instabilities that a pure market structure may cause. However, the land or property market is formalised by land administration systems whose importance in macroeconomic policy is not yet clearly understood.

Economic theory does recognise the role of land administration systems in national wealth creation. For instance North and Thomas (1973) identified the existence of property rights as the main cause for some societies to be much better off than others. Deininger and Binswanger (1999) and De Soto (2000) too, argued for the importance of the capacity of a nation to build land rights. De Soto (2000) established the link between the formalisation of property rights and the creation of wealth using the settlement of the American West as an example. Deininger and Binswanger (1999) argued for secure, transparent and enforceable property rights as a vital requirement for investment, economic growth and poverty alleviation.

Some land administration theory also promotes the importance of this discipline to the creation of wealth. Wallace and Williamson (2006), for example, suggested that in a property system the rights are the commodities, not just the land itself, and successful land markets derive strength from creating and marketing land rights and complex commodities. Building
an appropriate belief system is also deemed to be important, as property markets are driven
by the perception that land is a valuable commodity and that wealth is derived from land
holdings. The United Nations Economic Commission for Europe Land Administration
Guidelines state that land administration systems should create security not only for
landowners, but also for national and international investors, moneylenders, traders, dealers
and governments (UNECE, 2005). Through this they can provide order and stability in
society. The guidelines also state that systems of land registration are instruments of national
land policy and mechanisms to support economic development. Similarly, Williamson et al
(2010) convey the importance of land administration processes that are influenced by national
land policy and economic systems. They emphasize that infrastructures that manage land
data, particularly valuations data, should allow access, interoperability and multipurpose use
of that data.

However much of this land administration literature deals with developing nations, with a
focus on establishing land administration systems and recording land parcels, for the
purposes of basic taxation and the construction of formal land markets. In most federated
countries, such as Australia, United States and India, the land administration systems and
consequently the land markets are already well established, relying on a complex set of
interrelated institutions, formal and informal, to promote information flow. However they fall
into the constitutional authority of the state and territory governments. Essentially, the land
registry that maintains ownership information is part of a state or provincial government.
Information is sourced from various other departments, developers, surveyors or from local
governments. For instance, in India, generation and maintenance of the property records was
handed over to the state and territory governments in 1904. Since then different processes
evolved in different states (Deininger, 2008). Land transaction records are maintained by both
the revenue department and the registration department. The overlap increases transaction
costs and inconsistencies in land records, resulting in a greater potential for fraud. In a country that has twenty-eight states and seven territories, such independent process can create significant disparity. Due to this, India proposed the development of the National Land Records Modernisation Programme (NIRMP) in 2008, under the Union Rural Development Minister. Activities to be undertaken under this new national scheme included computerisation of registration, including entry of valuation details, and establishing inter-connectivity among revenue offices and other agencies involved in land records such as Survey and Settlement Offices, Registration Offices and the like (Sinha, 2009). The ambitious scheme is yet to be fully operational. As Roy (2010) commented,

“Data accessibility has long been as issue concerning the geospatial industry, a legacy of a colonial data policy that did not encourage data sharing outside the government or even within certain sections of the government” (page 25)

Rodríguez-Pose and Gill (2003) state that decentralisation of responsibilities and resources can undermine a central governments’ traditional role of maintaining a balanced economy. However, in China, a centralised system has proved ineffective as private ownership of land-use rights have begun to emerge (Zhang and Pearlman, 2009). For effective management of a national economy in any country with a tiered government structure, the relationship between governments needs to be understood, particularly in the context of property rights, their management and administration.

Both Australia and the United States also face issues resulting from the central government in each country having no constitutional authority over land administration. In addition to land registration, the land or property valuations department also forms part of the state governments in these federated countries. Often property valuation methods can be as varied as the property laws in various jurisdictions. In Australia for instance, Queensland, New
South Wales and some Victorian councils value and tax unimproved land. Other states tax land and buildings based on capital improved values. Valuations data is collected either by in-house or private valuers hired by the state or local governments. Data relating to ownership and value of properties is generally stored in multiple jurisdiction-based databases. Consequently, the land or property market in these federated countries is impeded by information asymmetries (Garmaise and Moskowitz, 2004). Market-supporting institutions are required to ensure that property rights are respected, that people can be trusted to live up to their agreements, that externalities are held in check, that competition is promoted, and that information flows smoothly (McMillan, 2003). Of this, information flowing up to the central government is essential in the management of national wealth. However, there is a lack of understanding at higher levels government about the role that established state-based land administration systems should play in macroeconomic policy making.

The shortcomings of economic and land administration theory in supporting the link between the two disciplines is clear. The following case studies further explore this link in practice, by looking at two macroeconomic process, taxation and interest rates, in the context of property markets in Australia. The information flows between these functions and the land administration processes of tenure and value that directly underpin property markets (Enemark, 2007) are studied, for this federated country. The property object approach, introduced by Bennett et al (2008), is used to distinguish each tax or complex commodity derived from a land parcel as a separate attribute of the land. This permits an in-depth analysis of the information flows to the levying authority of each instrument or attribute of the land parcel. The case study approach gives a clearer understanding of the land information needs of federal policy makers in a federated market economy.

3.0 Case Study Results 1: Monetary policy – interest rates in Australia
A country’s wealth is derived from capital, labour and land (Dale and McLaughlin, 1999). These are the factors of production whose management is generally undertaken by a country’s central government. Macroeconomic policy tools such as taxation and the setting of interest rates assist in this management of national wealth.

Monetary policy is generally controlled by a country’s central bank. Monetary policy decisions require authoritative information about transactions in capital, labour and land to effectively judge the status of the economy. Information about the land market is collected and maintained by land administration agencies.

In Australia, the Reserve Bank (RBA) is primarily responsible, under the Reserve Bank Act 1959 (Commonwealth of Australia, 2011a), for implementing monetary and banking policies that contribute to the stability of the national economy and the welfare of the Australian people. The main objective of its monetary policy is to control inflation through a regular review of interest rates, under the Banking Act 1959 (Commonwealth of Australia, 2011b).

Official interest rates, set by the RBA, depend upon how the economy is functioning at a certain time. Monetary policy decisions are expressed in terms of a target for the cash rate, which is the benchmark overnight rate for bank lending. Most banks charge a separate, slightly higher rate for debt financing. Figure 1 shows the Australian housing interest rates with respect to the cash rate set by the RBA over a period of 17 years.

The property or land market in Australia plays a significant role in the national economy. Of this, the housing market is the largest market in Australia (West, 2010). Due to the size of the investment, most property purchases require debt financing. At the end of April 2010, the value of outstanding housing loans financed by authorised deposit-taking institutions was $987,439 million (RBA, 2010).
Kohler and Rossiter (2005) found that an important consideration for property ownership is the ability to make financial commitments towards purchasing property and to meet any repayment obligations if a loan is taken out to purchase the property. Since the interest rates set by banks generally follow the official RBA cash rate (figure 1), a change in the cash rate can impact both these decisions. Higher cash rates and hence higher interest rates may dissuade a potential purchaser from investing in property. Similarly, higher interest rates can make otherwise affordable loan repayments, unaffordable. The same is applicable to a fall in the cash rate and consequently a fall in the interest rates set by financial institutions.

![Australian Housing Interest Rates](source: RBA, 2010)

**Figure 1:** Australian housing interest rates in comparison to Reserve Bank of Australia cash rate (source: RBA, 2010)

Changes to the cash rate affect affordability and hence investment in the property market. This consequently impacts on supply and demand. Since the land or property market, especially the housing market, contributes significantly to national wealth in Australia, timely and accurate information about land market transactions is essential to macroeconomic policy decisions that aim to effectively manage national wealth. In Australia authoritative information about the property market, such as ownership, value and property sale
information is maintained by the state and territory land administration agencies. There is no central database that records property and prices (West, 2010).

The situation in Australia with regard to the access to authoritative land market information by monetary policy makers is illustrated by figure 2.

Using the property object approach mentioned earlier, effective interest requires an interest payer, an instrument or interest object, a levying authority and authoritative information. In figure 2, the interest object attached to the land is a mortgage levied by a mortgage provider. The mortgage provider adjusts its interest rate on debt financing to closely follow the Reserve Bank’s official cash rate. Information flows between these three entities, the individual, mortgage provider and RBA, are already established.

Currently in Australia, though market information is eventually available at federal government level, it is held in separate state databases. As figure 2 shows, there is currently limited or no access to these authoritative data stores at federal level. Connectivity needs to be established between the government creators and users of land information.

Authoritative implies publically sourced, timely and accurate data. As the RBA pointed out, ‘data timeliness’ is a major problem with access to housing price data (RBA, 2004; 2005). This is attributed to the lack of consistency in transaction reporting requirements between the states. In most states, there is an absence of reporting requirement at the time of sale. For instance, the New South Wales government maintains a NOS (Notice of Sale) database for valuation and taxation purposes. Information about transactions is provided by the parties when lodging land dealings
Figure 2: The relationship between tenure, value and interest in Australia. Land administration is abbreviated to LA.

for registration with the Land and Property Management Authority (a state government land administration agency). This is usually after settlement has occurred. The Victorian government maintains historic property sales data in a database called PRISM from information collected through Notices of Acquisition and Disposition, which are supplied after settlement of the transaction (usually 60 days after the contract of sale). From the perspective of efficient economic policy, it is desirable for market analysis on house price data to be based on the period in which the price was determined, rather than when the transaction was later settled (RBA, 2005). Due to insufficient and untimely information flows and poor data integration at a national level, the RBA collects sale and transaction data from the private sector. For instance the RBA collects information about the commercial property sector, including vacancy rates, property prices and rents from the Australian Bureau of
Statistics and other organisations such as Jones Lang LaSalle, the Property Council of Australia and Savills Research (RBA, 2009). For sales transactions, the Bank also relies primarily on the Australian Property Monitors (APM).

In summary, the flow of accurate, authoritative and assured land information from state government to macroeconomic policy decision makers is impeded. The key issue is the time it takes for collected information to reach federal level. The alternative private sector solution provides more timely data, however, the information is not assured and collection techniques limit the overarching accuracy. The result is that decisions are made using less than optimal datasets, and ultimately result in fiscal policies being potentially out of kilter with the fiscal reality of the jurisdiction. Policy decisions that impact the national economy should be informed by acute, authoritative and assured information.

4.0 Case Study Results 2: Fiscal policy - land taxation in Australia

In a market economy anything that is tradable or disposable is taxable. Taxation involves taking processes that have value and extracting part of that value for government. The ownership and sale of property make up the main processes within a land market. In the context of this study, we can define taxes on land to be ‘government charges on the transactions and holdings of property that form part of a land market’. As with any other form of tax, taxes on land are ‘compulsory contributions levied by the state on a taxpayer’ (individual or legal entity).

Land taxes defined above can be divided into two categories: ad-hoc and periodic. Ad-hoc taxes are only charged when the asset is sold or otherwise disposed of. They are levied on one or other party involved in the market transaction, depending on the type of tax. Periodic land taxes are generally charged annually, and are typically borne by the owner of the property. Table 1 summarises the main taxes on land in Australia.
2009-10 values from the Australian Bureau of Statistics indicate that GST accounts for about 27% of total tax revenue for all levels of government. Taxes on property make up about 10% of total tax revenue. Of this, taxes on immovable property account for 6% and taxes on financials and capital transactions about 4%. Taxes on property were the largest source of taxation revenue (37%) for state governments in the same time period and were also the sole source of income for local governments (ABS, 2011).

The setting of tax rates form part of a nation’s fiscal policy that manage national wealth. Higher transaction taxes may cause otherwise affordable transactions, to become unaffordable. Similarly, higher taxing on the holding of property increases the cost of ownership and consequently increases the incentive to sell. These taxes in turn affect supply and demand in the market place.

In Australia, property is taxed at different levels of government. According to the earlier definition of a tax on land, an effective taxation system needs a taxpayer, an instrument being taxed, a levying authority and authoritative information about the taxpayer and the value of the instrument being taxed. For effective fiscal policy concerning land, the governments at each jurisdictional level need authoritative information about the ownership and value of property.

Figure 3 shows five tax objects levied by the various governments in Australia, as described in Table 1. Within the respective state governments, the revenue offices collect land tax and stamp duty, while the land administration agencies maintain the data stores of land information. In Australia, though publically sourced information about property ownership and value is available to the state taxation offices and local councils, it is generally maintained in separate databases by independent levying authorities. Duplication is evident. Additionally, as the dotted line in figure 3 shows, the Australian Taxation Office (ATO) has
limited or, in some cases, no access to the authoritative data stores of tenure and value
information. It relies on information declared in tax returns and on data purchased from the
private sector in order to collect capital gains tax and GST on real property. This brings the
reliability and accuracy of this information into question.

There is clearly information asymmetry in operation here. This relates to the gap between
information available within land administration agencies and what is actually shared with
the Australian Taxation Office. Clapp et al (1995), Dolde and Tirtiroglu (1997), Milgrom and
Stokey (1982) and Garmaise and Moskowitz (2004) all studied different problems associated
with information asymmetries within property markets. However, much of this literature
deals with horizontal information asymmetries between agents, brokers, buyers and sellers, or
between neighbourhoods or over time. Clarkson et al (2007) also looked at vertical
information asymmetry and the benefits of information sharing between tribal and other
forms of government in the context of underdevelopment and inequality in capital markets
and law enforcement. However literature does not adequately account for the problems
associated with information asymmetries between different levels of government within a
federated economy, in the context of managing national wealth.

Table 3: Classification of different taxes on land in Australia

<table>
<thead>
<tr>
<th>Tax</th>
<th>Description (CCH Editors, 2010)</th>
<th>Levying authority</th>
<th>Process taxed</th>
<th>Type</th>
<th>When</th>
<th>Generally Paid by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal Capital gains tax (CGT)</td>
<td>Net gains are treated as taxable income in the tax year an asset is sold or otherwise disposed of.</td>
<td>Central government Transaction Ad-hoc On disposition Seller</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>State Stamp duty</td>
<td>Levied on various land transactions either at a fixed rate or on the value of the transaction. In all states and territories stamp duty is levied on transfer of ‘dutiable’ property, primarily the transfer of land.</td>
<td>State government  Transaction Ad-hoc On disposition Buyer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>State Land</td>
<td>Based on the ownership or State Holding Periodic Annual Owner</td>
<td>State</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


| tax | use of land, except in ACT where land tax is also payable on land leases. It is largely levied on the unimproved value of taxable land. | government |
| Federal Goods and service tax (GST) | GST is essentially a value-added tax. The sale of all newly constructed residential property and the sale of all commercial property by a registered business is generally taxable. Though administered and collected federally, the revenue from GST belongs to the states and territories. | Central government | Transaction | Ad-hoc | On disposition | Buyer |
| Municipality Rates | Depended on land value assessments. Rates differ depending on the level of revenue the local government wishes to raise based on their proposed budget. The frequency of payment is determined by local councils. | Local government | Holding | Periodic | Annual/Quarterly | Owner |

**Figure 3:** The relationship between tenure, value and taxation in Australia’s land market
What policy makers need is national information about taxable objects related to land in order to meet broad policy needs such as assessing tax revenue capacities and meeting economic productivity challenges. This includes land tenure information, particularly ownership of taxable properties, and the value of the property or transaction to be taxed. For better management of national wealth in Australia, the large federal departments and agencies such as the ATO and RBA need authoritative, publically sourced property market information, collected and maintained by state land administration agencies. The need for Evidence-based Policy (EBP) is gaining a strong hold, particularly in Australia.

“The primary goal is to improve the reliability of advice concerning the efficiency and effectiveness of policy settings and possible alternatives” (Head, 2009, page 16).

Good data or ‘high-quality information bases’ is one key component of this (Head, 2009). To achieve this within a land market context requires links between the institutions that manage national wealth and those that support land market transactions to be established. If the information available to national agencies about the real state of the market is inaccurate, their ability to make sensible policy interventions is jeopardised. A new model is required to show the land information needs of federal policy makers in federated mixed capitalist nations, and initiate a paradigm shift regarding the increasing importance of the role of land administration processes to national policy in these nations.

The following section presents a simple, empirical model that links macroeconomic functions and land administration processes. Triangulated (c.f. Golafshani, 2003) from the results of the case studies, the model is aimed at policy makers in higher levels of government, to initiate a better understanding of the need for seamlessness between the two disciples, and a holistic information management approach for a better informed government.
5.0 Discussion: The property market tree

The case studies clearly illustrate the missing link between authoritative land market information and elements of monetary and fiscal policies in Australia. The situation in other federated market economies such as the United States and India is similar and potentially worse given the size and complexity of their respective federations. Where fiscal and monetary policies are used to manage a county’s wealth, policy makers need authoritative market information to judge the state of the nation’s economy and make evidence-based policy decisions.

For instance during periods of inflation banks sustain losses since money they receive from loan repayments is worth less than they money they initially loaned. To combat this, a country’s central bank will usually increase the official cash rate. The opposite is true during periods of deflation. Economic inflation and deflation can only be established on available market information. Information about transactions in the property market is an essential component of this.

In federated mixed capitalist economies where macroeconomic policies are administered at federal level and land administration functions at state level, there is a need to initiate a paradigm shift regarding the importance of better information flows between these institutions. For efficient fiscal and monetary policy, the large federal departments and agencies need national information about market transactions and taxable objects, which are currently held in separate state land administration databases in these countries. The Property Market Tree represents a new model to illustrate better links between macroeconomic functions and land administration processes, for better informed government (figure 4).

The Property Market Tree illustrates the need for adequate information flows between the government land administration and policy institutions, in order to sustain a healthy land
market. A healthy market can be growing or retracting, as circumstances suit. Traditionally strategies favoured local, regional and national authorities administering data development, acquisition and storage independently (Morgan, 1985). These silo approaches resulted in redundant, inflexible and occasionally counterproductive processes that were deemed myopic (Morgan, 1985). Government land administration agencies tend to work more or less independently within their fields of responsibility, and information production is often specific for limited sectors. Currently there is little coordination or aggregation of information within land administration in many federated countries. Coordination and integration require continuous, constructive action.

**Figure 4:** The Property Market Tree
The property market tree aligns well with Australia’s National Government Information Sharing Strategy (AGIMO, 2009) which promotes information sharing between government agencies in Australia. The strategy envisions that “timely, reliable, and appropriate information sharing is the foundation for good government and has the capacity to deliver a better way of life for all Australians” (page 21). Benefits to government agencies such as improved capacity for evidence-based policy and decision making and greater confidence in data quality and accessibility, are expected to ensue from agencies sharing information with each other (AGIMO, 2009).

Emerging practical approaches also support the paradigm shift recommended by the Property Market Tree. In Europe the Infrastructure for Spatial Information in the European Community (INSPIRE) Directive has led to the development of legally established ‘key registers’ of addresses and buildings in Netherlands (VROM, 2007). The registers contain authoritative information from municipal registries and are made available centrally through a national system managed by the Dutch Land Registry Office. The use of these is mandatory for all public agencies in the Netherlands. The concept of key registers stemmed from the goal that government must have access to reliable, high quality digital information (VROM, 2007). Regarding geo-information, the planned basic registers include buildings, addresses, parcels and maps (Besemer et al, 2006).

Sedunary (1984), in his nodal approach to land database configuration, showed the need for high levels of communication between the primary nodes of legal/fiscal and geographic or land information. He stated that the legal or fiscal node should integrate databases with functions relating primarily to property description, title registration, valuation and land tax. Additionally the popular and well-known concept of the multi-purpose cadastre to integrate land related data from individual land administration sectors was explained in the early 1980’s (NRC 1980; Kaufmann and Steudler, 1998). Cox (1983) showed how ill-informed
policy decisions to manage the property market in Britain in the early 70’s lead to adverse consequences for the country’s economy. More recently, Roberge and Kjellson (2009) showed how the absence of a reliable property rights infrastructure in the United States contributed to the collapse of its land market. Buhler and Cowen (2010) also supported the view that following the mortgage crisis, the federal government in the United States should take a more active role in supporting a national cadastre.

Like the United States, in Australia too land administration datasets cater primarily for internal information needs within individual agencies, and co-ordination at a national level is very limited. Land is an integral component of national wealth. Government policies formulated to manage national wealth should be based on authoritative information, a key component of which is information about transactions in land. What federated mixed capitalist nations need is a better recognition of the role of land administration in macroeconomic policy making, and a seamless approach to land information access and delivery at higher levels of government.

6.0 Conclusion

Current economic and land administration literature does not adequately exemplify the importance of a seamless approach between macroeconomics and land administration. In practice, the links or information flows between the tools of macroeconomic policy and market-supporting land administration functions are also problematic. This is particularly the case in many federated mixed capitalist nations where land market information is collected and maintained by state agencies and macroeconomic policies are made at central government level. The large federal departments and agencies need national property market information which is currently held in separate jurisdictional databases. This paper presents a starting point to emphasize the importance of a holistic approach to land information.
management at higher levels of government. The Property Market Tree illustrates that the tools for management of national wealth need authoritative information flows between land administration and federal policy making institutions. A national land administration and information infrastructure is the next step to achieving this goal.

Future research should focus on the technical, institutional and legal requirements of a national infrastructure for land information in federated mixed capitalist nations. What such an infrastructure needs is horizontal integration of jurisdictional datasets, followed by vertical integration from local to national level. The current structure of stakeholders does not work effectively in the twentieth century. Independent land administration agencies have the incentive to make significant economic gains by repairing their institution frameworks and incorporating cross-governmental sharing into their business models. Statutory powers of the state governments need to accommodate increased data sharing. While technical issues will also play a part, the governance, coordination, and cooperation required for data sharing and integration is likely to be most challenging.

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