

# The Conceptualisation, Sensitivity and Measurement of Holding Costs and Impact on Housing Affordability

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## Abstract

Housing affordability issues are gaining increasing prominence in the Australian socio-economic landscape, despite strong economic growth and prosperity. Its importance has captured the attention of the wider population, with the issue ranking highly across the broader political agenda. The need to provide affordable housing to meet the expectations of burgeoning populations, particularly young people, first home owners and the socially disadvantaged, is fundamental to maintaining stability of families and households and supporting an acceptable standard of living. Aside from maintaining essential structures that support social networks, there are many other reasons that lie behind addressing the issue. It is, for example, widely acknowledged as a major consideration for any new development, playing a major role fostering industry and employment.

The issue of housing affordability is multi-dimensional. The growing body of literature on the subject has identified many factors associated with housing affordability. These include macro structural / micro-behavioural variables such as interest rates, construction cost, income levels, buyer's decision, intentions, land supply, housing prices, and a range of other factors. The matter has many facets, is complex, and interwoven.

One factor that has been widely held to impact housing affordability is that of holding costs. Although only one contributor to the problem of housing affordability, the nature and extent of its impact requires clarification. Although related to land banking behaviour often exercised by both the public and private sector, it is much more multifarious than simple calculation of the interest cost, or opportunity cost, of long term land holding.

The Queensland Housing Affordability Strategy calculates that development holding costs typically add at least \$15,000 to \$20,000 per dwelling, for greenfield developments. These costs are generally acknowledged to be simply passed on by the developer, and is reflected in purchase prices paid. This paper investigates the possibility that the amount is likely to be of greater significance especially where time taken for regulatory assessment is excessive. A preliminary analysis undertaken suggests that even small shifts in assessment period can significantly affect housing affordability, emphasising the need for timely processing by regulatory authorities.

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There are potentially significant other costs associated with “holding” that inevitably act to drive up prices, and therefore impact housing affordability. These costs cannot always be easily identified, however it can be said that ultimately the real impact is felt by those whom can least afford it - new home buyers whom obtain finance: their mortgage repayments can be relatively easily pushed into the realms of un-affordability.

This paper also considers all the market and non-market variables likely to impact housing affordability, in the context of holding costs detail. In addition, as housing affordability matters have both space and time variance, this study suggests that additional work needs to be undertaken in breaking down the analysis by regions and towns in Australia over time. This needs to be compared to an international comparison study that confirms the extent and variability of regulatory assessment periods in Australia and elsewhere. Together with the foregoing, this will lead to the development of an econometric model clarifying whether the length of regulatory assessment period impacts holding costs, and, as a result, whether it can be established that the assessment period impacts housing affordability. This has significant policy implications for changing the framework used in Australian jurisdictions that might result in promoting or retaining affordable housing, or otherwise maximise the opportunities for affordable housing.

## **Keywords**

Holding cost, housing affordability, planning, assessment period, opportunity cost.

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## **Research Progression**

### ***Research Aims & Objectives***

1. To establish the nature and composition of holding costs over time, as related to residential property in Australia, and internationally.
2. To examine the linkages that may exist between various planning instruments, the length of regulatory assessment periods, and housing affordability.
3. To develop a model that quantifies the impact of holding costs on housing affordability in Australia, with a particular focus on the consequences of extended assessment periods as a component of holding costs. Thus, provide clarification as to the impact of holding costs on overall housing affordability.

### ***Research Questions***

1. What is the nature and composition of holding costs applying in Australian and international residential property markets? Is the matrix relatively static, or changing over time?
2. In relation to property, and property (residential real estate) development, what are the prevailing planning and statutory regulations utilised in Australia and internationally? Which (if any) of these instruments are used to support affordable housing concepts, and which (if any) of these instruments represent part of the holding cost matrix? In the context of housing affordability, has any public or private planning tool been identified in the literature as being more effective, or more destructive, than any other?
3. What is the extent and variability of regulatory assessment periods in Australia and internationally? Does the length of the regulatory assessment period impact holding costs?
4. As a result of the above, can it be established that the assessment period is a contributor impacting housing affordability? To what extent, and what are the linkages? What are the policy implications, e.g. does the evidence exist to demonstrate that changes to the framework used in Australian or overseas jurisdictions might result in promoting or retaining affordable housing?
5. Can a model be developed in the light of the foregoing to quantify the impacts of holding costs, focussing on the timing of assessment periods, in relation to housing affordability - or otherwise maximise the opportunities for affordable housing?

### ***Methodology***

In brief:

1. Literature review (holding costs / regulatory assessment and housing affordability)

2. Determine regulatory assessment periods in Australia, New Zealand, Canada, United States and UK. Personal contact and dialogue (interviews where possible), literature review, etc.
3. Establish holding cost theory and impute holding cost component. Model assessment periods against apparent holding costs: (regression / statistical analysis, other theoretical data modelling).
4. Establish evidentiary links between above and housing affordability

The literature review will incorporate investigation into the key issues related to holding costs, regulatory assessment, and housing affordability. This will be completed having special emphasis towards any research conducted that gives rise to linkages between the timeliness of regulatory assessment, and any ensuing apparent financial impacts.

This will set an appropriate background for proceeding with an analysis that will examine the nature of current prevailing regulatory assessment instruments, in both Australia and key international regions including Australia, New Zealand, Canada, United States and UK. Initially by literature review, it is intended to follow up this research by personal contact and dialogue (interviews where possible) with the key stakeholders in order to determine not only current status and experiences, but importantly, establish if there are any patterns existing over time and the last decade in particular.

It will also be necessary to undertake research based on content, and case study bases, enabling examination of specific instances within Australia and overseas, of holding cost variations, and the impact this has had on realisation outcomes.

This will be further evaluated using statistical analysis (multi-view statistical mode) including multi-variable regression analysis in order to develop predictive models that attempt to quantify the impact of planning delays, and other holding cost variables, based on various group relationship data. The data modelling component will be integral to establishing links between the length of regulatory assessment periods and holding costs, and as a consequence, ultimately clarification of the impacts on housing affordability. Other evidentiary links between holding costs, and housing affordability may also be established in the process.

### ***Compatibility With the AHURI Research Agenda***

The Australian Housing and Urban Research Institute (AHURI) is a national research organisation comprised of seven participating Research Centres (involving 12 universities<sup>2</sup>) throughout Australia, specialising in housing and urban research and policy. It is primarily involved in the creation and dissemination of knowledge in housing markets, housing policy and programs, and the urban environment in cities, towns and regions.

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<sup>2</sup> Queensland (Queensland University of Technology and University of Queensland), Victoria (Royal Melbourne Institute of Technology, Swinburne University and Monash University), ACT (University of Canberra), South Australia (Flinders University), Tasmania (University of Tasmania), NSW (University of Sydney, University of New South Wales), and Western Australia (Curtin University of Technology and Murdoch University).

The AHURI Research Agenda 2008 details their research funding priorities. One of the targeted areas of research for 2008 (section 4) is in **the supply of affordable housing** (*AHURI Research Agenda 2008*, 2007). It has a policy research aim to “*understand how governments use housing assistance and other policy levers to increase the supply of affordable housing*”. The Research Agenda suggests that, inter alia, government needs to understand the range of factors shaping the supply of affordable housing and what policy responses across housing, planning, taxation and other portfolios might effectively improve affordable housing outcomes.

This research complements the AHURI agenda by looking at aspects of housing affordability not currently addressed (i.e. the impact of holding costs, including timeliness in regulatory assessment). At the same time it will assist clarification, and complement, AHURI research currently underway, in particular project 70393 which is examining the impact of government regulations on house prices. Relevant AHURI research questions include:

- *How do the designs of government low-income home ownership support programs compare and how do they compare with current products offered by private sector mortgage providers? How have changing national and local economic circumstances affected the costs and benefits of such programs? What forms of government action and subsidy most effectively support low-income households' access to and maintenance of home ownership?*
- *Historically and comparatively across Australian capital cities, how have changing supply side conditions, particularly land supply, affected house prices?*

## **The Issue of Housing Affordability**

### ***The Definition & Significance of Housing Affordability***

There is little doubt that the notion of affordability carries. The availability of affordable housing has been described as being central support to a decent life - entailing the maintenance of stable households connected to the main institutions in our society – jobs, services, family and social networks (Mike Berry, 2002).

Recognition of its significance in an Australian context can be traced back several decades. According to a recent AHURI<sup>3</sup> report (Gabriel et al., 2005), in Australia, affordability emerged as part of the policy language in the 1980s as a response to mortgage interest rates of the order of 17 per cent and a housing price boom, and to policy reports such as the National Housing Policy Review and, later, the National Housing Strategy. As has been espoused (Berry et al., 2004), housing is and will always be a central concern of good government, especially with increasing disparities in incomes and housing costs. Over the last few years, it has re-emerged, again as a consequence of rising house prices placing pressure on lower income households and, increasingly, middle income households seeking to purchase their first home. The escalating nature of this problem has been noted (Burke et al., 2007), since when housing costs in relation to income increase, problems associated with poor affordability typically become more accentuated. This observation is supported by findings recording that “*where over 50 per cent of income is going towards housing costs, many renters are adopting practices that are arguably unacceptable in an affluent society*”. Gabriel also comments that while first home ownership and rising costs have been addressed in Productivity Commission reports, there is now a concern by many policy makers to widen this debate about affordability to consider the implications of rising house prices in the context of a declining public rental stock.

The definition of and benchmarks relating to housing stress vary across policy environments (Berry et al., 2004). Whilst affordable housing is defined differently across the various policy, planning, program and research contexts in which the term is used, the following definition may hold a common thread for many: “*Affordable housing is housing which is affordable for low and moderate income households across home ownership, private rental as well as public rental tenures*” HPLGM 2005, p.1 (Gurran et al., 2007). This definition has been adopted by the Housing, Planning and Local Government Ministers in developing the Framework for National Action on Affordable Housing.

‘affordable housing’ refers to new and existing dwellings consumed by low to-moderate income households across all the main housing tenure categories, without suffering housing stress. Regardless of definition, it is hard to escape what is seen a fact by many – that is, the declining housing affordability faced by many Australians, even after a decade of strong economic growth (Mike Berry, 2002). Berry further suggests that the debate in Australia over ‘affordable housing’ was strongly boosted in the early 1990s by the first publications of the Commonwealth Government’s National Housing Strategy (NHS). This approach defined the matter as follows: *the*

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<sup>3</sup> Australian Housing & Urban Research Institute

*term 'affordable' housing conveys the notion of reasonable housing costs in relation to income: that is, housing costs that leave households with sufficient income to meet other basic needs such as food, clothing, transport, medical care and education (NHS, 1991, p. ix).*

In reviewing international evidence, it might also be seen that there are striking parallels in the economic and demographic circumstances that are said to be driving recent problems of housing affordability: namely, the global rise in property prices over the past decade and, in particular, the stronger appreciation of housing prices in the inner urban precincts of larger metropolitan areas (Katz et al. 2003), (Gabriel et al., 2005).

Taking a step back, and considering the underlying factors behind housing prices, it may be readily seen that the Australian housing market represents a classic example of the economic model of supply and demand. Over the last decade or so there has been a sustained increase in demand for housing which has been maintained by:

- relatively low interest rates, coupled with increased competition between home lenders making financing easier to obtain
- increasing real household incomes
- schemes designed to encourage and support new home buyers, particularly first home buyers
- increased relative attractiveness of real estate property as an investment

However, whilst such an outward shift in the demand curve would cause an expected increase in prices, the ability of supply to respond quickly is limited since it takes time to develop land for housing and to construct houses. The short term elasticity of supply of housing is low (Sloman & Norris, 2006). This could explain why between 1996 and 2003 real house prices increased by no less than 70%, and about half the increase occurred in 2002/03.

This general definition of demand is commonly held by property economics commentators. In addition, the age, size, income and other characteristics of households requiring consideration in order to determine demand for housing (Reed, 2007), with demand for commercial and industrial property created by a population's demand for the goods and services to be produced or distributed at these sites. Thus, a strong link is established between population, housing demand, commerce industry and employment. All these factors in turn relate strongly to the issue of housing affordability.

Housing affordability is also impacted by the passage of time. This especially relates to the time taken by regulators to provide input and make decisions on projects once a financial commitment has been made by a project's proponent. This is more generally included in the calculation of holding costs by developers, a cost which is inevitably passed on to end-purchasers.

The extent to which this impacts a project varies considerably, however it is

interesting to note the comment recently made by the ALGA<sup>4</sup> President that “...*I do have concerns about some state processes. State planning is too slow and does not allow councils to get on with the development of housing developments and the associated social infrastructure. This just encourages fly-in/fly-out arrangements which are anathema to the establishment of local communities*” (Bell, 2007). The speed at which Infrastructure and services are implemented, which is often driven as much by planning processes as it is by economics, is strongly linked with the costs of development and ultimately, housing affordability. Affordability problems are also thought to be driven primarily by low incomes rather than occupation per se (Yates et al., 2006a).

Although some variation exists as to the extent and impact, most housing researchers would agree with Hall whom concludes that housing affordability problems have been clearly established; intensifying significantly in Australia over the past 15 years (Hall et al., 2003). Housing Affordability is a key research theme and there is currently a good deal of interest being shown in this area, possibly – or at least in part - due to broad-base political agendas. Organisations such as AHURI are particularly concerned as to how government planning processes might be impacting this. For example, Randolph (Randolph, 2007) is currently looking at the cost effect of planning regulations and charges on house prices and affordability in Australia. His project will attempt to quantify the cumulative cost impacts of State and local government regulations and charges, and evaluate the cost impacts of existing and proposed regulation on housing production against the explicit objectives of the regulation, as a basis for avoiding unnecessary or unjustifiable regulation and for offsetting unavoidable affordability impacts. Another example is an investigation into International housing trends and policy responses (Milligan, 2007) whom is investigating, inter-alia, the use of planning mechanisms to improve the supply of affordable housing in growth areas, building on comparative research already funded by AHURI in order to broaden the focus to a wider range of national policies.

### ***Measurement of Housing Affordability in Australia***

The notion of affordability is tightly embraced in south-east Queensland, and more particularly the Beaudesert region in which the New Beith urban Village concept is located. In presenting their Housing Strategy, SGS (*Housing Strategy: Beaudesert Local Government Area*, 2007) provide it as a major focus so that “*wherever possible the affordable nature of the Beaudesert LGA is maintained*”. This is in keeping with SEQRP Regional Policy which incorporates “*the provision of affordable (low cost and potentially social) housing in major new developments or redevelopments*”.

### ***Employment of the “Median Multiple”***

The extent of the housing affordability problem in Australia has been recently highlighted by the 3rd Annual Demographia International Housing Affordability Survey (Cox & Pavletich, 2007) which has expanded coverage to 159 major markets in Australia, Canada, Ireland, New Zealand, the United Kingdom and the United States. The Demographia International Housing Affordability Survey employs the

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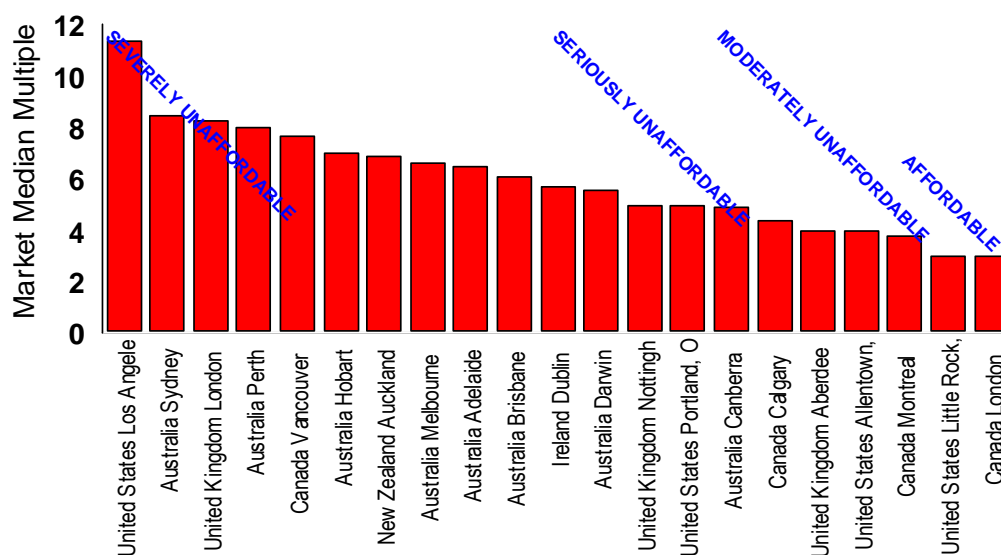
<sup>4</sup> Australian Local Government Association – Cr Paul Bell, ALGA President

“Median House Price to Median Household Income Multiple,” (“Median Multiple”) to rate housing affordability (the Demographia Housing Affordability Ratings categorise Median Multiples from “Affordable” at 3.0 or Less, to “Severely Unaffordable” at 5.1 & over).

In recent decades, the Median Multiple has been remarkably similar among the nations surveyed, with median house prices being generally 3.0 or less times median household incomes. This historic affordability relationship continues in many housing markets of the United States and Canada. **However, the Median Multiple has escalated sharply in Australia, Ireland, New Zealand and the United Kingdom and in some markets of Canada and the United States. 2006 Housing Affordability Ratings draw attention to the most pervasive housing affordability crisis is in Australia, with an overall Median Multiple of 6.6.** Affordability is stated in the Report to be only marginally better in New Zealand (6.0) Ireland (5.7), and the United Kingdom (5.5). On the other hand, the national Median Multiple in Canada is 3.2, indicating that housing is one-half as expensive relative to incomes as in Australia. This also compares to the national Median Multiple in the United States which is 3.7.

The Demographia report cites the least affordable markets as being generally in California, Hawaii, the US East Coast, Australia, the United Kingdom, New Zealand and Vancouver. Whilst the least affordable market rated is Los Angeles & Orange County, with a Median Multiple of 11.4, which is far above the “severely unaffordable” threshold of 5.1. Brisbane is rated “severely unaffordable” at 6.1 median multiple.

Housing Affordability - Comparison of Australia and Selected Western Nations



Source: Cox & Pavletich (2007)

Figure 1 - Housing Affordability Nation Comparison

Therefore, Brisbane (along with most other Australian capital cities) is categorised as “severely unaffordable”:

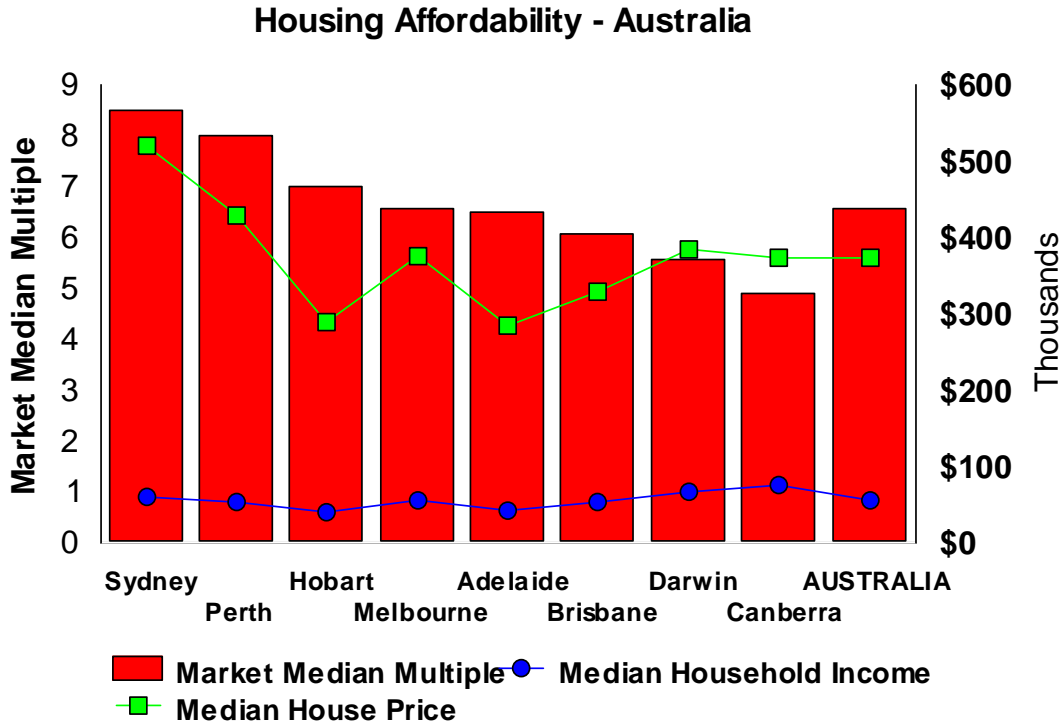


Figure 2 Housing Affordability – Australia. Extracted from Cox & Pavletich, 2007.

Whilst the Demographia report examines a number of possibilities as to why affordability is problematic, it does correlate a strong relationship between the quantum of regulation, and affordability. A number of commentators suggest that the more highly regulated markets overwhelmingly exhibit inflated housing prices, while more liberally regulated markets tend to remain more affordable (Cox & Pavletich, 2007) as per the graph below:

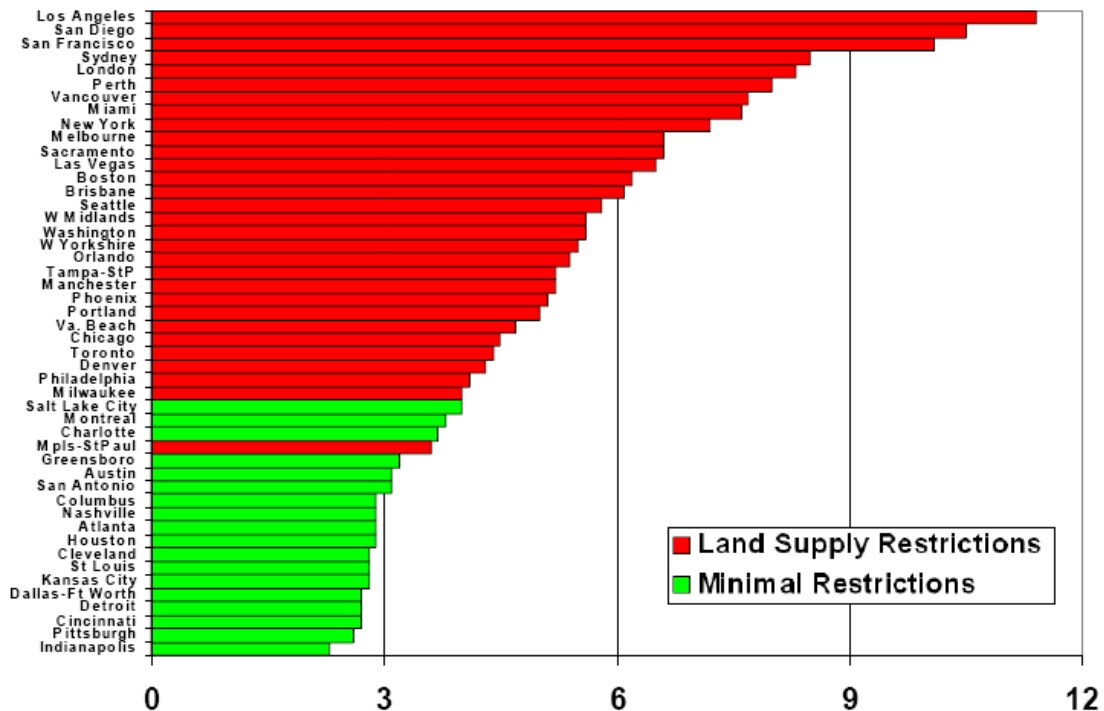


Figure 3 - Median Multiple By Market (Cox & Pavletich, 2007) - Median Multiples

However, the *quantum* of regulation may not necessarily equate to the *strength* of regulation. For example, it has been demonstrated that a strong government role in urban policy and land regulation explains the higher levels of affordable housing achieved through the planning process in the United Kingdom and the Netherlands, in comparison to Australia and North America (Gurran et al., 2007)<sup>5</sup>.

One logical explanation as to why land supply restrictions correlate strongly with affordability, is **the imputation of holding costs that inevitably reside alongside increased time taken for regulators to process development applications.**

### *The 30/40 Affordability Rule*

A more traditional and perhaps simplified approach towards housing affordability is a measurement based on mortgage or rental payments. This is the methodology adopted by SGS in their assessment (*Housing Strategy: Beaudesert Local Government Area*, 2007). It is based on a “rule of thumb” being that housing costs on mortgage or rental payments should not exceed 30% of household income - in the case of the lowest 40% of household income distribution. This is known as the “30/40 affordability rule” and is regarded by many commentators as relatively sound measure, but perhaps more widely as a convenient measure since “*it provides continuity with traditionally used measures and because it is simple to apply and easy to understand*” (Gabriel et al., 2005). Such low income households are considered to place themselves in a position of “housing stress”.

Yates calculates that in Australia in 2001, some 836,000 households or just over 13 per cent of all households were in housing stress with housing cost ratios of 30 per cent or more of their gross household income (Yates et al., 2006a). Berry comments that there is a growing pool of households experiencing housing-related hardship or ‘housing stress’ which is in fact *created* by the pattern of government intervention occurring at a time of increasing economic inequality and insecurity, on the one hand, and high house price inflation (especially in the large cities), on the other (Mike Berry, 2002). It has been suggested that the key policy challenge raised here is to explore ways of more effectively attracting significant volumes of private investment into the provision of affordable housing, to complement existing government programs in the area.

### *Other Measures of Affordability*

Whilst the “30/40 affordability rule” definition is certainly a convenient guideline as alluded to previously, it may be overly simplistic. It has been recognised by some researchers that in fact commonly held measures may disguise the true extent of housing stress in Australia (Burke, 2004). Gabriel (Gabriel et al., 2005) suggests that a case can be made for providing additional complementary indicators that are more responsive to household needs and capacity to pay. For example, different household types and different income groups have very different capacities to pay for their housing and that the measured outcomes will differ according to the way in which key

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<sup>5</sup> In Australia, the lack of direct Commonwealth Government responsibility for urban policy and planning is not necessarily a barrier to achieving a broader mandate for promoting affordable housing through the planning system, although it does help explain why this has not been achieved to date (Gurran et al., 2007).

variables are defined. The NSW Centre for Affordable Housing also caution against using such formulas that are sometimes used to describe housing affordability. They suggest that while this can provide a useful benchmark of housing stress, the reality is that the definition of affordability varies according to a household's individual circumstances. Accordingly, their efforts in developing affordable housing have mainly targeted low-moderate income households that are earning less than the median income for the area where they live and are paying a significant proportion of their income toward housing costs ("About Affordable Housing," 2007). There are in fact various sets of measures related to households' ability to access affordable housing, whether ownership or rental. Appendix 8 - Attributes of major affordability measures used in Australia - summarises the characteristics and problems with each method, which are based on imputed affordability using a variety of data sources. Each of these measures is a different way of capturing the changing ability of households to afford home purchase or access rental. None is necessarily better than the others. They all have different strengths and weaknesses, including overcoming the challenges of data limitations and methodology (Gabriel et al., 2005).

Other problems with using the 25 and 30 per cent benchmark measures to examine housing affordability have also been established. Research conducted several years ago in Australia (Burke, 2004) found that additional costs and lower income measures push many over the 25 per cent benchmark, helping to explain anomalies amongst public renters. The nature of this related to data: (i) being based on disposable (after tax) incomes, and public housing rent rebates being based on pre-tax income and, (ii) including service charges, house or contents insurance, and any expenses designated by the respondent such as self-maintenance.

There are also other difficulties associated with the assessment of affordability that relies upon broadly based indicators. For example, it is difficult to examine market trends as a whole since, as has been observed (Burke et al., 2007), the housing market is incredibly varied in composition and performance. It is not a single market, and trend averages can therefore be misleading.

### ***The Correlation of Housing Affordability & Housing Costs***

Regardless of methodology, it has been well established that that housing affordability problems are highly correlated with high housing costs (Yates et al., 2006a). This highlights the fact that high housing costs as well as low incomes are the major contributor to housing affordability problems for working households. Research continues to demonstrate that in addition to Sydney, priority regions with a high incidence of stress include south-east Queensland and in the inner regions of Melbourne (in that order).

It is apparent that the consequences and physical manifestation of housing stress can be dire. This has been described as over-crowding and under occupancy, homelessness, spatial segregation differentiated by socio-economic status and physical dilapidation, resulting in higher incidences of crime, lowered employment prospects, and adverse family and community relationships (Cox & Pavletich, 2007).

In Queensland, government initiatives in the development of affordable housing is summarised in the QHAS (*South East Queensland Infrastructure Plan and Program 2007-2026*, 2007), however the chief tenants of this policy are expanded by the Department of Housing whom have developed a definition of affordable housing to assist stakeholders in the broader housing system to identify ways they can contribute to the provision of affordable housing. This definition suggests that the following should be considered ("What is 'affordable housing'?", 2007):

- **Appropriateness of the dwelling**  
Dwellings should be appropriate to the needs and circumstances of the household in terms of the number, size and configuration of rooms, safety considerations, the versatility of indoor/outdoor spaces, and ease of physical access, regardless of the physical capacity of household members.
- **Housing and social mix**  
A range of housing types, tenures and styles should be available to meet the needs of people at different stages of their life cycle and under negative economic circumstances. Planning should seek to avoid the impacts of a housing market that excludes all but relatively high-income earners. We need to avoid the development of neighbourhoods that do not contribute to community well-being.
- **Tenure choice**  
Households should enjoy tenure choice and consumer protection, including access to long lease contracts, shared equity arrangements, and cooperative ownership structures, as well as opportunities for home purchase and private rental.
- **Location of housing**  
Housing should be well located in relation to places of employment and to the range of services, facilities, communication and transport networks required to meet other household needs. Planning and design should ensure that residential neighbourhoods and buildings are compatible with adjacent land uses.
- **Quality of environmental planning and design**  
Housing planning and design should be responsive to local microclimate and environmental conditions by incorporating energy efficient design principles. Housing should fit into and enhance the neighbourhood, ensure privacy to residents and neighbours, and incorporate the principles of crime prevention through environmental design. Neighbourhood design should promote safe and convenient pedestrian access to local services and facilities.
- **Cost**  
Low-income households (the bottom 40 per cent of households on the income distribution) should spend no more than 30 per cent of their income on mortgage or rental payments. All households should be able to meet the cost of their dwellings, and the longer-term costs of maintenance and energy consumption, while meeting other lifestyle needs.

The above definition updates that provided in the SGS Report to Council (*Housing Strategy: Beaudesert Local Government Area*, 2007), building upon that quoted from

an earlier 2005 departmental document. The SGS Report also identifies five target groups and their particular affordable housing needs<sup>6</sup>. Unfortunately this is based on 2001 Census demographics previously exhibited in the Beaudesert Shire, and to some extent ignores important emerging trends occurring that place even greater emphasis on the nature and importance of affordability and choice. For example, families consisting of a couple with children are cited as the most dominant group within the Beaudesert LGA comprising 51% of all households. Whilst acknowledging the ageing population and impacts this might have in the future, “smaller households” (lone persons and childless couples) have increased over the past years and are highlighted in the 2006 Census data sets. Recognition needs to be given to the increasing propensity of this group which for the first time in will actually overtake as the dominant form of household across most areas of Australia within the next few years. Certainly, this group as a whole do prefer access to entertainment facilities such as cafes and restaurants, however there is no evidence to support they prefer smaller dwellings than families with children – in fact the evidence points towards the opposite. Indeed, the Housing Affordability debate has to some extent ignored the fact that house sizes in Australia generally are increasing in size despite changing demographics, and in many instances this phenomenon is more apparent in this country compared to many others. This obviously not only has important implications for planners, but also highlights the need for a more balanced understanding of the key drivers behind affordability.

The QHAS requires improving factors that enable the market to respond more effectively to provide housing - especially affordable housing. Given the scenario that exists as described above, this is obviously a key challenge for the region.

## **Holding Costs & Impact on Land Value**

### ***The Critical Element of Time***

Land development projects, like many other kinds of projects, are typically evaluated in an economic sense, by using different measures of merit based on discounted cash flows. Therefore, the element of *time* is a critical determinant of viability since the discount applied to any project is always based on discount over time. Since time is critical, it is readily apparent that if a project takes longer to come to fruition, for any reason, then costs of that project will increase. In the case of a property development project, costs relating to that portion of time when a project is held up are generally regarded as “holding costs”.

Holding costs can take many forms, but always relates one way or another with regards a computation of the “carrying costs” of an initial outlay that has yet to fully realise its ultimate yield.

A stark example of the extent to which holding costs can promote action – and sometimes extreme action - by land owners, can be seen in the propensity of banks unloading repossessed property in order to avoid future losses. Sometimes deemed “the cost of holding on”, a United States commentator (Suskind, 1991) observed that

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<sup>6</sup> The five groups are families; lone persons and childless couples; aged’ youth; and disabled.

during a period of real-estate glut, banks' future losses from unloading repossessed property can run to billions of dollars given that sales generally fetch only 50% to 60% of the loan value. The dilemma faced in this situation is paradoxical: should banks sell property at “knockdown prices” and take another heavy charge against earnings? Or should they hold it - hoping for a higher price if the market recovers - and incur continuing costs of managing and maintaining the property?

Thus, holding costs represent a major determinate of value. Although sometimes considered a “hidden”, it is nonetheless often pervasive. It affects housing affordability, the actions of repossesseses, and the profitability of developers. In this paper, it is considered primarily in the context of impact upon housing affordability, however

### ***The EOQ Model –Embryo for More Sophisticated Holding Cost Measurement***

Holding costs are in reality simply a derivation of the basic EOQ (Economic Order Quantity) model, which identifies the penalty associated with ordering either too much or too little – where the shape of the “holding cost curve” demonstrates the sensitivity of the basic EOQ model to lot-size errors when holding costs are assumed to be a strictly increasing (though not necessarily linear) function of average inventory (Brown et al., 1986). The premise is that the penalty associated with ordering either too much or too little is a function not only of the size of the error but of the shape of the holding-cost curve as well.

Derivations of the EOQ model may be found in a variety of applications. For example, most models of inventory control utilise modified versions of the EOQ formula, with the capital cost of holding inventory able to be calculated by adding a fixed interest rate,  $r$ , times the purchase price,  $C$ , to the out-of pocket holding cost. However, this assumes the per unit purchase price is constant, therefore where the purchase price  $t$  varies over time, methods for computing an adjusted interest rate,  $r$ , are suggested along with modifications of well-known heuristics and formulas for lot-sizing, with  $r$  being estimated as the sum of the unadjusted interest rate and the average expected purchase price decrease, measured over a period between  $1/3$  and  $2/3$  of the length of the order cycle (Berling, 2007). Other variations of the economic order quantity (EOQ) model such as Ferguson’s (Ferguson et al., 2007) enable it use in the case of perishable goods, such as milk, and produce - by considering cumulative holding cost as a nonlinear function of time. In this instance the holding cost curve parameters can be estimated via a regression approach from the product’s usual holding cost (storage plus capital costs), lifetime, and markdown policy. Thus, a significant improvement in cost vis-à-vis the classic EOQ model is provided.

Interestingly, for more complex inventory holding cost measurement (for example, in the measurement of inventory in a two-product system involving joint manufacturing and remanufacturing) it has been determined that holding cost rate outcomes of a net present value approach, and an average cost approach, are approximately equivalent. This has been demonstrated in a recent paper (Çorbacioğlu & van der Laan, 2007) which concluded that the correct holding cost rates deviate from traditional valuation methodology, with impact on operational performance demonstrable.

The EOQ model forms the basis for examining the cost of holding money. In the context of hyperinflationary conditions, research undertaken in the UK (Higson et al., 2007) has enabled methodology for estimation of loss in purchasing power from holding monetary items able to be tested via a 'two point' estimation formulae. This appears to be effective in scenarios where only sparse information sets are available – albeit certain assumptions being made about the way monetary holdings respond to variations in the purchasing power of the currency.

### ***The Relevance of Opportunity Cost & the Use of Capitalisation and Discounting***

The concept of opportunity cost involves the calculation of a present value, on the basis that we are solving for the difference between the current day value of a compounded future amount. The amount of interest that could have been earned during the term of an investment – the compound interest – represents the difference between the present value and the future value amount, and is known as the discount. Guthrie describes the discount as being the “shrinkage” that occurs when an amount of money is moved back in time at the compound interest rate (Guthrie & Lemon, 2004). This is also more generally known as the opportunity cost, or perhaps more colloquially, opportunity “lost”.

The general present value formula is expressed as:

$$PV = \frac{FV}{(1+i)^n}$$

Where

*PV* is the Present Value

*FV* is the Future value

*i* is the interest rate per period

*n* is the total interest periods

The transposed formula  $PV = FV (1 + i)^{-n}$  is typically expressed since it is easier that way for the algebraic calculator. The factor  $(1 + i)^{-n}$  is the *discount factor* (also known as the present worth of 1 factor), that is simply the reciprocal of the *accumulation factor*, i.e.  $(1 + i)^n$  which is the basic tool for solving accrued compound interest.

Thus, we can determine that the discount factor for an investment that can earn 8.5% per annum over 12 years is  $(1+0.085)^{-12}$ . Thus, an asset worth \$100,000 in 12 years time can be calculated to have a present value of \$37,570. The difference between the asset's future worth of \$100,000 and the present value, i.e. in this case \$62,429, represents the “opportunity cost” of investing \$37,570 over 12 years, or the amount of interest that could have been earned at the relevant compound interest rate, had it been invested. Therefore we have a formulae for Opportunity Cost *oC* as:

$$oC = FV - \left[ FV(1+i)^{-n} \right]$$

It is this imputed value over time that is fundamental to the concept of “holding cost”. If an investment is made in a certain asset that requires it to be held during a period in which incurs no growth, then the amount of interest foregone because of the need to “hold” the investment is equivalent to the “opportunity cost” of holding the asset. In other words, one depiction is that it represents the interest foregone due to the expense made on the outlay.

Obviously, the longer the time taken, the greater the cost of holding the asset. However, what is often the greatest difficulty to determine is the selection of the interest rate. As pointed out (Darnell & Evans, 1988), the rate of interest provides the correct measure only if the relevant alternative to holding cash balances is holding interest bearing assets. That suggests that the opportunity cost measurement should reflect the utility that is anticipated to having to forgo as a result of making the choice to hold money. The definition given for “Opportunity cost” therefore relies upon a comparison between holding non-interest bearing money, and the best alternative providing the greatest financial yield.

The usual approach to measuring the cost of holding money is to note that by holding cash balances an individual foregoes income that could be earned on an interest-bearing asset (Darnell & Evans, 1988). From this, Darnell states, it is usually inferred that the ‘opportunity cost’ of holding cash is determined by the rate of interest. Further, any debate has been over the selection of a data proxy for the rate of interest (e.g. should it be a short/long rate? the dividend price ratio? the whole structure of interest rates? etc.). The value  $v$  of holding non-interest bearing money is zero, since the future value of \$1 remains \$1, no matter the passage of time: the face value remains the same. In that instance,  $v_1 = 1$ . In the case of holding interest bearing money the formula is equivalent to the impact of  $r$  the nominal interest rate is  $v_2 = (1 + r)$ . However, as Darnell argues, the value of holding a physical good is equivalent to a change in value due to  $\eta$  inflation, expressed as  $v_3 = (1 + \eta)$ . Thus, the results for each possibility can be expressed in the following table:

**Derivation of financial gains foregone (the “best alternatives” for holding cash)**

Action	Relevant alternative action	Percentage gain foregone
Holding non-interest bearing money	Holding interest bearing money	$(v_2 - v_1) / v_1 = r$
Holding non-interest bearing money	Holding a physical good	$(v_3 - v_1) / v_1 = \eta$

*Taken from The Holding Cost of Money (Darnell & Evans, 1988)*

This argues that in determining the cost of holding these money balances is the greater of the nominal interest rate, and the inflation rate. This is because whilst the monetary gain foregone in the case of purchase of an interest bearing asset is the nominal interest rate, the monetary gain foregone in the case of a good is the rate of inflation . This identifies the potential gain foregone willingly, in order to enjoy the benefits of holding the asset.

Accordingly, the general formula for the expected cost of holding money may be expressed as<sup>7</sup>:

$$oC = \max(r, \eta)$$

Reed suggests that, in relation to a property asset, the calculation for measuring the cost of the holding period (or property “reversion”) is either the application of capitalisation rate to an income stream (if the property is income producing), or conducting a discounted cash flow analysis (DCF) if there is an irregular stream of inflow and / or outflow payments (Reed, 2007). The latter computes the present value of an expected reversion, and in the case of a property model the income stream and reversion are valued in one operation. Regardless, ***the longer the holding period, the greater the risk***, and therefore the greater the discount rate used in such analysis. Reed states that this applies equally for leveraged or non-leveraged investments since there is an amortised cost in the former, or otherwise an opportunity cost acquired in the latter case. This is in general agreement with the Adams explanation of present value and time (Adams et al., 1968) whom states that in an effective market, the price of land will reflect capitalisation of the anticipated future flow of net rent. Until the time of development, the capitalisation process suggests a time path for land prices. A distinguishing feature of vacant land, however, is that up to the time it is developed the return to the owner is zero, or if we consider taxes and related expenses, negative.

Theoretically, then, if the development of the land has been anticipated, the price of vacant land should tend to follow a time path determined by the discounting of its value at development at the prevailing interest rate. Changes in expectations, interest rates and holding costs, market imperfections, and short term construction requirements will lead to divergence of prices from the path. Relationships between land prices and relevant variables from the economy are to be anticipated. If we assume  $V$  at the time of development  $t$ ,  $V$  is itself the present value of an expected series of net returns, and an appropriate rate of discount,  $i$ , the present value  $P$ , assuming continuous discounting, is as follows (Adams et al., 1968):

$$P = V / e^{it}$$

Thus the relative rate of change of the present value, with respect to  $t$  is as follows:

$$\frac{dP/dt}{P} = -i \quad \text{or} \quad -(i + r)$$

Where

- $r$  is the rate of real estate taxation
- $V$  is the value (at the time of development)
- $t$  is the time of development
- $P$  is the present value
- $i$  is the appropriate rate of discount

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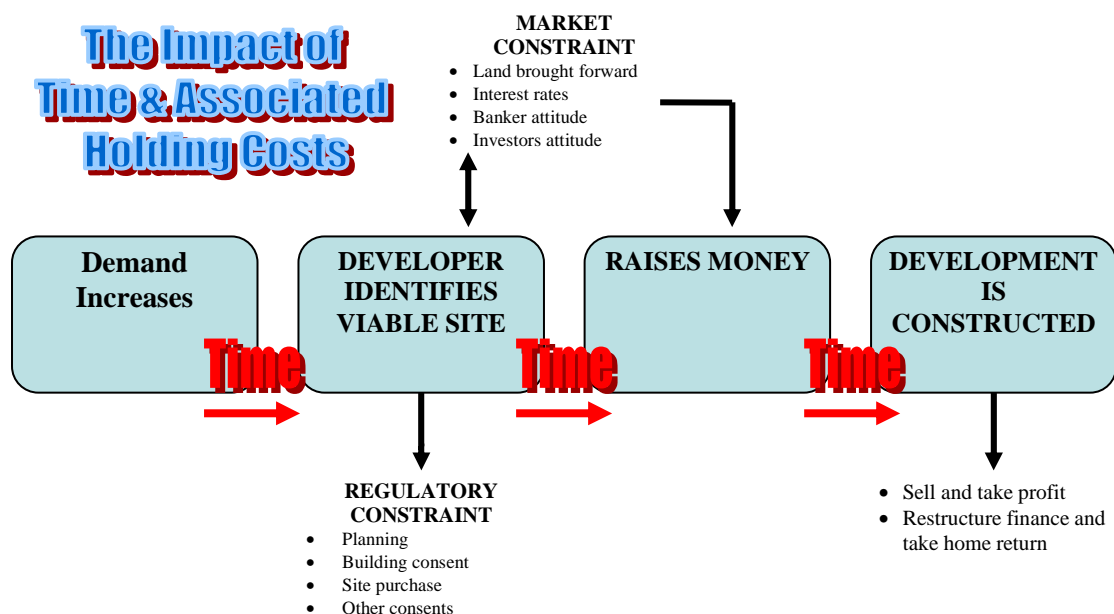
<sup>7</sup> A number of interesting points are noted (Darnell & Evans, 1988) whom state that (1) the real rate of interest is never the holding cost of non-interest-bearing money. The real rate of interest may be seen as the opportunity cost of buying a good when holding an interest bearing asset is perceived as the best alternative. (2) In studies of hyperinflation, the opportunity cost off holding real balances has been identifies as the expected rate of inflation. Since in such episodes the inflation rate persistently exceeds the nominal rate of interest, the analysis presented provides the explicit theoretical justification for this practice.

In other words, the price of an undeveloped piece of land can be expected to grow at the rate  $(i + r)$  where  $i$  corresponds to the net rate of return which can be earned on other comparable investments. Adams points out that in a perfectly operating market, the present values of properties will be aligned to their anticipated values to the expected dates at which the properties will be developed. If the factors which determine development value and date of development are taken into account, undeveloped land prices may be expected to increase over time at the rate  $(i + r)$ . This is entirely the result of capitalisation and discounting.

The costs of housing may relate to construction costs, land costs, costs of land purchase and eventual sale (i.e. taxation and professional fees), developers profit for risk-taking, and also financial costs including interest costs and opportunity costs. However, it is the latter that is considered here. This includes (Eccles et al., 1999):

- the prevailing level of interest rates;
- the length of time that the development takes to complete;
- the length of time that the development takes to produce income or sell.

Therefore the development process and its constraints caused by timing delays can be summarised thus:



*Adapted from source: (Eccles et al., 1999)*

Commercial real estate tends to have a much longer holding period than equities, due in part to the relatively high transaction costs and illiquidity issues (Sayce et al., 2006). Research has shown that a median holding period for commercial property is between 8 and 12 years (Collett et al. 2003). The age of property and return are key factors influencing the holding period, reducing in properties acquired during a recession. In the UK an analysis period of 5 years is commonly used, 10 years is more common in the US, and 20 years in the Netherlands is not uncommon. Property traders may use shorter analysis periods and those using long term finance may use a

longer analysis in line with the debt repayment period. As a rule of thumb the shorter the analysis period, the more sensitive the IRR and NPV will be to the exit valuation.

As a minimum, holding costs will relate to at least the rate applicable to the funding of a development project, according to the nature of the Project. The generally accepted principle or assumption is that the development moneys will be outstanding for an average of half the period during which the estate is being developed and sold. Assuming a two year life (this obviously is derived from marketing studies), the interest allowance is calculated on the development costs including the contingency allowance (Whipple, 1995). Whipple, in evaluating cash flow analysis, rightly emphasises the importance of timing on the profitability of development projects. Static models ignore a sensibly conceived scenario analysis.

It is clear that while actual base assumptions might change significantly, present values could alter the calculation particularly where the timing factors run out of control. Whipple (Whipple, 1995) points out that because comparatively high money costs apply to real estate development projects, the discounting effect can become very pronounced and as a consequence *the timing factor is of paramount importance*. Therefore, **a successful real estate development (financially speaking) is largely a product of the professionalism with which cash flow are timed.**

### ***Liquidity Effects***

Other factors might also be included under the general ambit of “holding costs”. For example, land taxes may not be neutral in their economic impacts due to liquidity effects. Liquidity effects of land taxes may be in the form of holding cost effects or capitalization effects (Bourassa, 1992). Bourassa also recognises that “holding cost” effects may occur when land is being withheld from development for non-financial reasons, such as the direct benefits of land ownership. Such non-financial reasons might also include processing delays by approving bodies and other planning matters that impact on time. Capitalization effects may occur when there are imperfections in capital markets which prevent the acquisition of land for otherwise viable projects.

This augurs well with earlier work completed (Bourassa, 1988) which examines the liquidity effect results from increases in the rate applied to land. The incentive effect is due simply to the increase in supply that occurs as the excise effect of the tax is reduced. The liquidity effect has two components. One is the effect on current landowners, **who must bear increased holding costs** and who are thereby encouraged to improve their properties or sell to someone who will. The other component is the obverse of **increased holding costs and is due to capitalization of the tax in land value. Reduced land values make it easier for potential developers to acquire land**

Bourassa in his later analysis proceeds to examine the other economic impacts of taxes on land and concludes that the effect on current landowners, who must bear holding costs in the form of land taxes, are thereby encouraged to improve their properties to maximize return on investment or sell to someone who will do so. The other component of the liquidity effect is simply the obverse of increased holding costs, nonetheless economists generally agreeing that increases in taxes on land result

in decreases in land value. The assumption though would always be that imperfect capital markets are preventing developers from obtaining sufficient capital for land purchases for otherwise viable development projects. This is largely an empirical question (Bourassa, 1992).

Another perspective is the extent of house price volatility due to restriction, or otherwise, of land supply by governments. Commonly referred to as “land banking behaviour”, this strategy impacts not only the behaviour of property developers, but also housing prices – and therefore, affordability. In examining these issues, Tse calculates an equation that long-term land holding costs should cover interest costs on the basis that the amount of land sales by the government and land in developers’ land banks tend to decrease when market interest rates increase (Tse, 1998). He demonstrates that land banking behaviour is governed by economic conditions. Greater uncertainty about future housing price appreciation could also have a negative effect upon the land-holding costs. Tse also supports the argument that *uncertainty increases the expected future value of the vacant land*. In addition, larger developers tend to spend more time and resources devoted to land acquisition. Further, that in the real estate industry, skills in land purchase and timing completions to maximise gains from house price inflation tend to be more important than the ability to compete through technical innovation. *The inevitable conclusion reached is that by marketing lots sooner, and pocketing the money sooner, developers can reduce borrowing costs and fund new projects.*

The conclusion reached here is that *the rate of interest can be viewed as a kind of land-holding cost*, since a developer’s optimal amount of land bank occurs when the expected marginal rate of return of land holdings equals the rate of interest. This has been expressed (Tse, 1998) as follows:

$$\max_{L,A} k = \frac{\theta(A) - rL}{A - L}, \quad s.t. \quad A > L$$

Where:

$k$  rate of return

$L$  loan amount

$A$  amount of land in land bank

$\theta(A)$  expected return from holding (A) amount of land in land bank

$r$  interest rate to finance land holdings

Thus, the maximisation of the rate of return on equity is a result of choosing both the amount of land in a land bank, and the amount of loan.

Tse also raises the question of *uncertainty* as a probable impactor on holding costs. A negative effect could be achieved where greater uncertainty about future housing price appreciation occurs (i.e. the expected future value of vacant land increases); whilst uncertainty about future increases in construction costs makes the vacant land relatively less valuable – making the decision to develop the land at the current time relatively more attractive (Tse, 1998).

### ***The Planning Perspective – Use of the GAM Model***

There can also be a conflict in measuring the economic impact of projects, and how that same scenario might be viewed from a planning perspective. Pettit advocates the use of an analysis method called the goals achievement matrix (GAM) where the lower the GAM value the more efficient the planning scenario. A GAM is a more appropriate method for evaluating land use scenarios because it reflects a summary measure of spatial conflicts between results from scenarios and desirable land uses defined by planning policy (Pettit & Pullar, 2004). This obviates the more restrictive methodology of the economic efficiency model, represented by a least cost alternative (typically measured through the use of cost-benefit analysis), as against the efficiency of a particular planning alternative which measures how well urban and regional planning policy objectives are satisfied.

### ***Regulatory Assessment – A Component of Holding Costs?***

The holding cost calculation is often been regarded as inclusive of time taken by regulatory authorities to assess and consider applications for a particular development. Generally, the scale and nature of a proposed development will determine the complexity and nature of the application required, and the quantum of information included in the application. Whilst the process itself does obviously vary from region to region, the general principle is that of giving legislative power to a procedure that compares what is being proposed, against a set of guidelines or criteria. For example, in Queensland, Australia, this process is determined by the “Integrated Planning Act 1997 (IPA)”, with the lodgement of a Development Application (DA) being a requirement for all forms of development including, for example, carrying out building work, operational work, reconfiguring a lot or making a material change of use (Garner & Layton, 2008). The Integrated Development Assessment System (IDAS) is the system established under the IPA to manage the lodgement and assessment of most development related activities. When submitting a DA applicants must demonstrate how a proposal satisfies the Development Vision, Performance Criteria and Performance Standards contained in the Development Guidelines.

Constraints of planning decisions have been described (Tse, 1998) to typically include transport, infrastructure, environmental impact, competing land uses, and construction capacity. However, such constraints are not applied uniformly and an argument exists that the amount of available land, and the supply of housing, may at time relate to political considerations outside of what might be otherwise justified by analysing population and household growth. This leads Tse to conclude that not only land supply, but also planning controls, development processes and marketing practices are important determinants of housing supply.

It is therefore not unreasonable to surmise that larger and more complex applications take a longer period of time for regulatory authorities to assess how, or if, the guidelines are met. However, this is time during which a developer must “carry” any costs outlaid on a particular project, and in the case of large residential estate developments, it is more likely to be lengthy than not. This period can therefore represent a significant component, but certainly not the only component, of “holding costs”.

In addition, the point has been made previously (refer “*Employment of the ‘Median Multiple’*”) that the correlation between land supply restrictions and affordability can be logically explained by the assertion that holding costs inevitably reside alongside increased time taken for regulators to process development applications. However, some researchers (Gurran et al., 2007) have compared outcomes achieved in levels of affordable housing in the UK and Netherlands as against Australia and North America, concluding that a *strong* government role (as against the *quantum* of government involvement) in urban policy and land regulation can explain the achievement of *higher* levels of affordable housing. This seems to augur with Tse’s conclusions for the Hong Kong market (Tse, 1998) where it was demonstrated that the imposition of more “land-sales restrictions” by government will actually lower the level of land prices.

In consideration of the above, it is submitted that whilst a link exists between the delays experienced in obtaining planning approvals, and housing affordability, that link – although likely - does not necessarily establish itself as a holding cost.

## **The Calculation of Holding Costs**

### ***The Complexity of Holding Cost Quantification***

Quantifying holding costs, and other costs associated with delays in obtaining assessment and approvals, can therefore be complex depending on the Project and the variables applying in particular circumstances. The extent to which these costs can escalate has been highlighted by various commentators – as an example, Elliott (Elliott, 2007) calculated that in a recent Queensland development project the tax and regulatory charges accounted for 26% of the purchase price of \$579,000. He points out that excessive delays and massive court costs (on appeals) all result in excessive holding costs. Elliott also cites the Queensland Government’s recent ‘Affordable Housing Strategy’ (QHAS) which acknowledges holding costs due to these delays can add \$20,000 per unit to the end price (he believes this is a conservative figure). In the aforementioned example, involving a 112 apartment project in Brisbane’s West End, a total tax bill of \$150,000 per unit was revealed. He calculated GST on the sale (\$57,000) state stamp duty on sale (\$21,522) GST on construction (\$32,044) then the Brisbane Council infrastructure charges (\$22,857) plus the state land tax (\$2,779) and council rates (\$2,161) along with state registration fees for titles (\$141) and the interest bill on the holding cost associated with delays in council assessment (\$8,928). Elliot believes the situation is similar elsewhere, but is worst of all in Sydney.

### ***Calculating Holding Costs for Individual Projects – comparison with estimates derived for the Queensland Housing Affordability Strategy***

Holding costs in the case of new land or greenfield development, potentially represents a significant cost that is ultimately borne by consumers (end purchasers). The key questions here are:

- In the case of specific projects, what is a likely outcome in the particular instance? Is this likely to be of greater significance for the subject project area compared to others?
- Are there other costs associated with holding that potentially act to drive up prices, e.g. what is the impact of unnecessary delays in development assessment resulting in higher costs because of associated delays?

The concept of bringing greenfield land into development ahead of time frames currently developed, is well entrenched within the QHAS. This approach, at least theoretically, enables lands to be brought onto the market in the short to medium term, increasing market competition and choice (*South East Queensland Infrastructure Plan and Program 2007-2026*, 2007). Whilst an assessment of the provision of associated infrastructure and services is obviously also crucial, the speeding up of such processes are necessary if the issue of affordability is to be adequately addressed.

The QHAS suggests that development holding costs during the assessment period can add between \$15,000 - \$20,000 per dwelling (*South East Queensland Infrastructure Plan and Program 2007-2026*, 2007) – as observed by Elliot previously. The QHAS recognises that this cost is passed on to the end purchaser, but can be significantly reduced by a more efficient planning and development assessment system. Not only do unnecessary delays in the development assessment process result in sometimes substantial delays in bringing land and housing to the market, but particularly in areas of high growth it can lead to higher development costs.

### ***An Preliminary Economic Model Examining the Effects of Time for a Property Development project***

The following develops an economic model to examine the effects of time - particularly focusing on holding costs - on a typical greenfield land development project in south-east Queensland. The results tend to support the QHAS estimations. Assumptions used to create the “base case scenario” are as follows:

- Interest rate (cost) - 9.00%
- Development Timing: (all post Identification of suitable site and site purchase)
- Assessment period: Planning & Building Consents including DA – 18 months
- Funds raising (debt and / or equity) 3 months
- Construction and development 9 months
- TOTAL development time from acquisition 30 months
- Undeveloped Land Cost - \$37,500 per lot equivalent based on gross yield area
- Acquisition costs - 3% of acquisition and land costs per lot p.a
- Development Costs, say \$75,000 per lot
- Interest Costs on development - based on 30% of total development period = 9 months @ 9%
- Selling Costs @ 4.7% gross realisation

- Developers Margin - 20% of Total costs
- Gross realisation = \$165,000 per lot.

The above assumptions are considered to be “typical” for a development in the project area concerned, representative of a realistic operating scenario, against which various “what-if” scenarios have been modelled based on various time periods taken for assessment of planning and building consents (including DA), the outcome of which is fully detailed at Appendices 3 and 4, and is further summarised in the table below:

<u>Per Lot Basis</u>	BASE CASE SCENARIO				
	0	12	18	24	36
Assessment time (months) for Planning & Building Consents including DA					
Undeveloped Land Cost	\$37,500	\$37,500	\$37,500	\$37,500	\$37,500
Acquisition costs	\$1,125	\$1,125	\$1,125	\$1,125	\$1,125
	<b>\$38,625</b>	<b>\$38,625</b>	<b>\$38,625</b>	<b>\$38,625</b>	<b>\$38,625</b>
Loss of Interest over development period	\$3,476	\$7,265	\$9,286	\$11,395	\$15,897
Rates, special council charges and land tax say	\$1,364	\$2,727	\$3,409	\$4,091	\$5,455
Development Costs, say	<b>\$75,000</b>	<b>\$75,000</b>	<b>\$75,000</b>	<b>\$75,000</b>	<b>\$75,000</b>
Interest Costs on development	\$1,964	\$3,980	\$5,008	\$6,049	\$8,171
<b>Total Development costs including interest</b>	<b>\$81,804</b>	<b>\$88,973</b>	<b>\$92,703</b>	<b>\$96,535</b>	<b>\$104,523</b>
<b>Total Costs of Development including acquisition costs</b>	<b>\$120,429</b>	<b>\$127,598</b>	<b>\$131,328</b>	<b>\$135,160</b>	<b>\$143,148</b>
Developers Margin	\$24,086	\$25,520	\$26,266	\$27,032	\$28,630
Sale price before selling costs	\$144,515	\$153,117	\$157,593	\$162,192	\$171,778
Selling Costs	\$6,792	\$7,197	\$7,407	\$7,623	\$8,074
Gross realisation	<b>\$151,307</b>	<b>\$160,314</b>	<b>\$165,000</b>	<b>\$169,815</b>	<b>\$179,851</b>
<b>TOTAL HOLDING COSTS FOR PROJECT</b>	<b>\$5,441</b>	<b>\$11,245</b>	<b>\$14,294</b>	<b>\$17,444</b>	<b>\$24,069</b>

The above model demonstrates that in a typical or “base case” operating scenario, the total holding costs for a project equate to approximately \$15,000 per lot, assuming it will take a total of 18 months for the assessment of planning and building consents (including DA). If this time is reduced by 6 months, the holding costs will reduce to just over \$11,000 per lot, and if time is increased by 6 months, the holding costs will increase to \$17,000 per lot. Put simply, for every month the assessment time is delayed, the end-user (whom ultimately incurs the holding costs) will pay extra \$500 more. If any of the assumptions used, noted previously, vary, then there will be a commensurate or greater impact on the project. Suffice to say that those assumptions having the greatest impact include interest rates, and development timing (incorporating holding period). Initial acquisition cost and developers margin tend to be a functions related to gross realisation expectations.

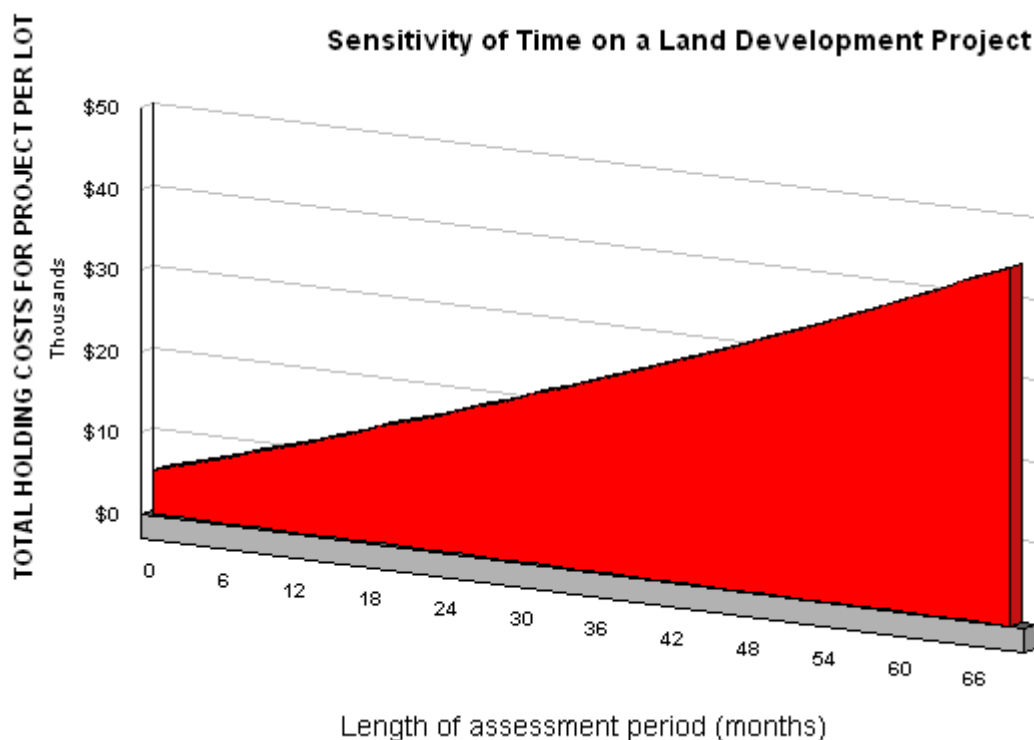
If these timeframes are further extended, the model demonstrates that holding costs could climb to \$40,000 per lot and beyond, if the time taken for assessment exceeds 5 years, or looked at another way, an additional 3.5 years more than the “base model”

scenario. This would effectively raise the average cost of each allotment from \$165,00 (Base model assumption) to over \$200,000 as follows:

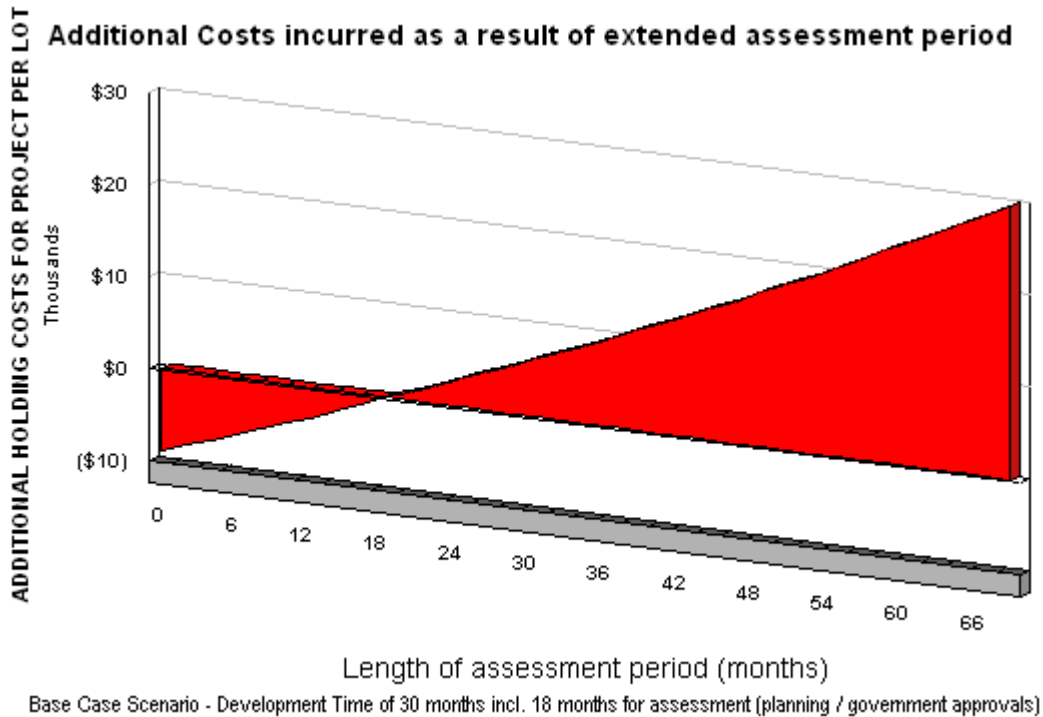
**Economic Analysis to Examine the Sensitivity of Time on a Development Project**

Time (Months) - Planning & Building Consents including DA	0	12	18 (Base Case)	24	36	48	60	68
Total Costs of Development including acquisition costs	\$120,429	\$127,598	\$131,328	\$135,160	\$143,148	\$151,597	\$160,545	\$166,807
Gross realisation required	\$151,307	\$160,314	\$165,000	\$169,815	\$179,851	\$190,467	\$201,708	\$209,576
<b>TOTAL HOLDING COSTS FOR PROJECT</b>	<b>\$5,441</b>	<b>\$11,245</b>	<b>\$14,294</b>	<b>\$17,444</b>	<b>\$24,069</b>	<b>\$31,154</b>	<b>\$38,738</b>	<b>\$44,091</b>

The above information can be graphed thus, with time sensitivity extending from 0 months for assessment, through to 68 months as follows:



If the “base case” model of an 18 month assessment period (i.e. the time taken to obtain approval of planning consents including DA) is reasonably representative, it may be demonstrated that total holding costs for a project are almost \$10,000 greater than if the time taken for assessment was zero (refer graph below). If the assessment period becomes extended for any reason, there is a commensurate impact on additional holding costs as follows:



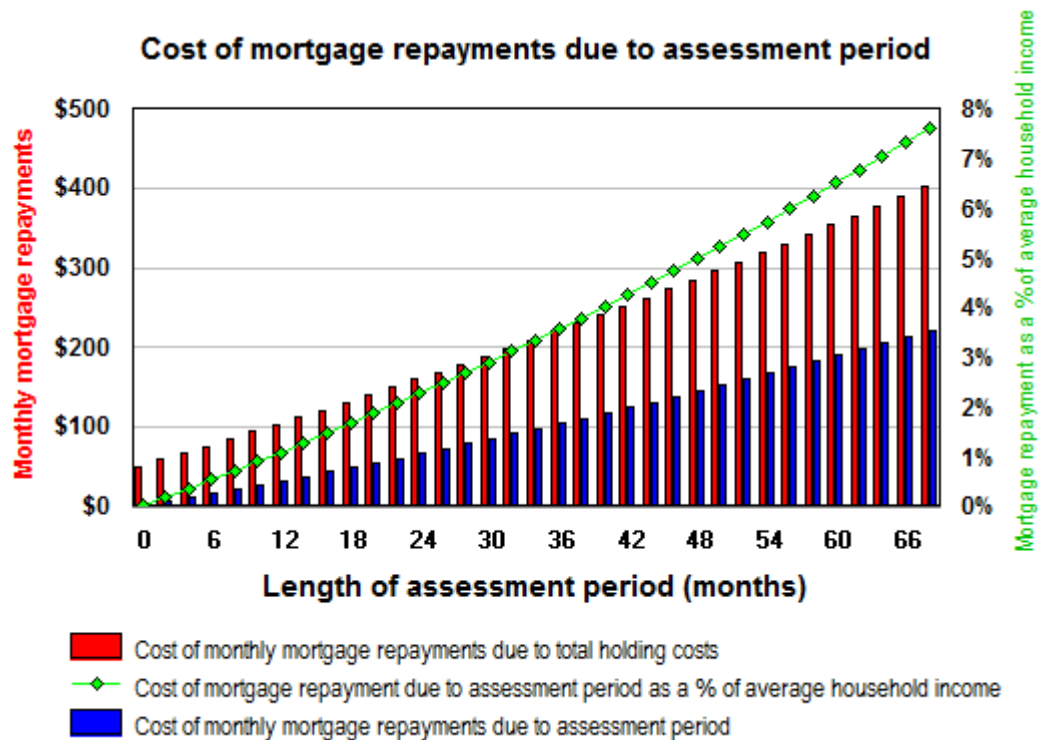
The above information, projected until 36 months assessment period, is detailed at Appendix 4.

### ***Increased Costs and Housing Affordability – Measurement of the Impact Upon Mortgages***

In terms of impact upon affordability, perhaps the most useful way to look at this is to examine not only the quantum of additional costs that extended assessment periods will cause, but perhaps more importantly, the impact upon the end-purchaser whom ultimately bears this cost, since a developer will inevitably pass these costs on. Since new home buyers typically obtain finance to complete their purchase, if the cost of acquisition rises, then so does their mortgage. Such consumers are therefore potentially pushed into the realms of un-affordability. Therefore, a convenient way to examine this impact is to calculate the additional monthly mortgage repayment required to cover the costs of extended assessment, and also the total costs of these mortgage repayments over the life of a “typical” loan period. The impact of these costs can then be examined in terms of average household income. In this way, the impact of assessment time can be directly related to housing affordability since it is looked at in the context of the “30/40 affordability rule” mentioned in the previous section.

The results of this model, and the resultant impacts on affordability are summarised at Appendix 5, and in the following graphic. It demonstrates that given a base case scenario of 18 months assessment time representing point “zero”, if the assessment time is extended to say 36 months it will add another \$89 per month additional mortgage repayment (total holding costs actually add a total of \$220 per month in

mortgage repayments<sup>8</sup>), equating to \$21,416 over the life of a typical loan period of 20 years. The additional costs of mortgage repayment as a result of extended assessment period as a % of average household income in this instance would be 3.06%, with the overall cost of mortgage repayment as a result of assessment period is 3.57% of average household income. The impact of even lengthier assessment periods accelerates as time proceeds as demonstrated thus:



For example, if the period of assessment rose to 5 years, the additional costs of mortgage repayment as a result of extended assessment period equates to 7.65 % of average household income. It should be noted that this percentage would be even higher for those in the bottom 40% of household income distribution - in concert with the “30/40 affordability rule”.

Conversely, even a 6 month reduction in assessment period equates to a approximately 2% reduction in the percentage of household income devoted to mortgage repayments. This highlights that **even small shifts in assessment period can significantly affect housing affordability, and emphasises the need for timely processing by regulatory authorities**

<sup>8</sup> The base case scenario indicates that holding costs add \$130 per month in mortgage repayments, rising from \$50 per month in the case of zero assessment time.

## **Conclusions**

This paper has examined the complex issue of housing affordability in association with holding costs. It is acknowledged that housing affordability has many facets and requires a multi-dimensional approach, and whilst recognising that holding costs would be only one contributor, it is nevertheless clearly significant. This research is indicative only with regards the potential impact holding costs have on overall housing affordability. There needs to be significantly more research into it's underlying nature and effects, and in particular, an analysis over time.

Attempts have been made to examine various models utilised for both defining and measuring holding costs, with the ultimate conceptualisation relying upon derivations of the Present Value / discounting approach. Some of the various elements of holding cost, and its relationship with opportunity cost, have been examined, with a preliminary assessment of the possible linkages with regulatory assessment periods and their impact. The matter is not straightforward, with a few ambiguities emerging as a result of some research indicating distinctions between the strength, as against quantum, of regulation. Evidence is presented that there can be opposing effects.

Further analysis is also required across multiple regional areas to see if there are any patterns emerging. This includes case study analysis wherever possible, and broadly based analysis by regions and towns in Australia, as well as cross-referencing with a rigorous international comparison study. This needs to be conducted over time especially given the issue of housing affordability itself has a space and time variance.

Whilst an interim computer model has been developed demonstrating the potential impacts of holding costs on housing affordability over time, there has been no attempt to take it to the level of an econometric model that demonstrates the likely predictors of housing affordability especially those focussed on the impact of planning delays due to extended regulatory assessment periods. In addition, this preliminary research requires the additional consideration of further market and non-market variables likely impact on housing affordability, in the context of further analysing the impact of holding costs in detail.

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