The Impact of Planning Delays & Other Holding Costs on Housing Affordability

Abstract

Housing affordability is gaining increasing prominence in the Australian socio-economic landscape, despite strong economic growth and prosperity. It is a major consideration for any new development. However, it is multi-dimensional, has many facets, is complex and interwoven. One factor widely held to impact housing affordability is holding costs. Although it is only one contributor, the nature and extent of its impact requires clarification. It is certainly more multifarious than simple calculation of the interest or opportunity cost of land holding. For example, preliminary analysis suggests that even small shifts in the regulatory assessment period can significantly affect housing affordability. Other costs associated with "holding" also impact housing affordability, however these costs cannot always be easily identified. Nevertheless it can be said that ultimately the real impact is felt by those whom can least afford it - new home buyers whom can be relatively easily pushed into the realms of un-affordability.

Keywords

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

Introduction

Nature & Scope of this Paper

In looking at the impact of development holding costs on housing affordability, this paper investigates the possibility that its contribution may be of greater significance than that commonly held - especially where the time taken for regulatory assessment is excessive. The investigation is broken down into two parts. Firstly, examination of the nature and composition of holding costs over time, as related to residential property in Australia. Secondly, establishment of linkages that may exist between various planning instruments, the length of regulatory assessment periods, and housing affordability.

A literature review on the definition and measurement of housing affordability provides a suitable platform upon which the nature and composition of holding costs can be examined. Proceeding to evaluate the length of the regulatory assessment period and the extent of correlation with holding costs paves the way to examine the extent and linkages of the assessment period as a contributor impacting on housing costs, and therefore affordability. Holding cost theory, and the imputation of holding cost components are examined prior to the modelling of assessment periods against apparent holding costs. The latter assists in establishing evidentiary links with housing affordability.

The end result is the development of a preliminary model quantifying the impacts of holding costs on housing affordability. This model, in focussing on the timing of assessment periods, assists inter alia in understanding how to maximise the opportunities available to policy makers.

The Issue of Housing Affordability

The Definition & Significance of Housing Affordability

The availability of affordable housing has been described as being "central to supporting a decent life - entailing the maintenance of stable households connected to the main institutions in our society – jobs, services, family and social networks" (Berry, 2002a). This is consistent with overwhelming evidence that housing has a significant influence on, and is a significant driver of, life fulfilment and quality of life (Garner, 2006).

It is possible to trace the significance of housing affordability, in an Australian context, back several decades. According to a AHURI[1] 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. It was also used to inform policy reports such as the National Housing Policy Review and, later, the National Housing Strategy (1991). As has been espoused

[1] Australian Housing & Urban Research Institute

(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.

Whilst the definition of, and benchmarks relating to housing stress vary across policy environments (Berry et al., 2004), most commentators would agree that declining housing affordability is faced by many Australians, even after a decade of strong economic growth (Berry, 2002b). Although some variation exists as to the extent and impact, many 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).

Measurement of Housing Affordability in Australia

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) covering 159 major markets in Australia, Canada, Ireland, New Zealand, the United Kingdom and the United States. The Survey employs the "Median House Price to Median Household Income Multiple," ("Median Multiple") to rate housing affordability by categorising Median Multiples from "Affordable" at 3.0 or Less, to "Severely Unaffordable" at 5.1 & over.

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 (far above the "severely unaffordable" threshold of 5.1), Brisbane is recorded at a median multiple of 6.1 and thus is rated "severely unaffordable", along with most other Australian capital cities.

Whilst the Demographia report examines a number of possibilities as to why affordability is problematic, it does correlate a strong relationship between 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). 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)[2]. Nonetheless, one logical

[2] 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).

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; Mortgage Stress, High Stress, and Severe Stress Defined

A more traditional and perhaps simplified approach towards housing affordability is a measurement based on mortgage or rental payments. 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".

The above scenario has also been more generally described as "Mortgage Stress" - the situation in which homebuyers are paying 35 per cent or more of their income on home loan repayments (Kryger, 2003). An alternative definition, adopted by the National Housing Strategy, is based on the proportion of income paid for housing by income units in the lowest 40 per cent of the income distribution range. The basis for the these definitions of mortgage stress is the general rule that financial institutions will not allow a household to take out a housing loan if the monthly home loan repayment, calculated over a 25 year term, exceeds one-third of monthly household income. While it is acknowledged that not all households paying 35 per cent or more of their income in loan repayments are necessarily experiencing stress (indeed, some homebuyers, especially those on higher incomes, may be voluntarily paying more than 35 per cent), mortgage stress refers particularly to the high risk that a stressful situation might arise.

High stress is a related condition where people borrow or use credit cards to cover mortgage payments. Severe stress has also been similarly defined as being unable to meet repayments without refinancing, with mortgagors typically resorting to put repayments on their credit card.

Various commentators have attempted to mix or embellish these definitions in order to more specifically define particular groups. For example, a recent survey (*Rising credit card debt masks Australian mortgage stress - Fujitsu Consulting - Mortgage Report Volume 6*, 2007) has concluded that people who had to adjust their spending habits to pay off a home loan were suffering from "mild mortgage stress". Furthermore, instead of defining mortgage stress as borrowers spending 30 per cent of their after-tax monthly household income on repayments, it was suggested (North, 2008) that "severe mortgage stress" was when borrowers were falling behind in repayments, thinking of selling up, or facing default proceedings against them. The Fujitsu report supports changing the definition of mortgage stress so it refers to the bottom 40 per cent of income earners who were spending more than 30 per cent of their income on home loan repayments. This is because it can be demonstrated that someone on a very high income who has chosen to have a very large mortgage and still has a lot of money to live on after that could technically be defined as being in stress if you just used the 30 per cent rule.

Holding Costs & Impact on Land Value

The Critical Element of Time, & Impact on Housing Affordability

Housing affordability is 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 time impacts a project varies considerably, however it is interesting to note comment recently made by the ALGA[3] 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).

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 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

[3] Australian Local Government Association – Cr Paul Bell, ALGA President

costs represent a major determinate of value. Although sometimes considered a "hidden", it is nonetheless often pervasive. It affects housing affordability, the actions of repossesses, and the profitability of developers.

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 its 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 (Çorbacıoğlua & 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 s the interest rate per period
n s 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 η 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	$(v_3 - v_1)/v_1 = \eta$

Adapted 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.

Reed (2007) 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 steam 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:

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

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

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.

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 in 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 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 (Bourassa, 1992) 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.

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 (1998) 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. 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 (Tse, 1998). 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).

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 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 (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, 2007). Elliott also cites the Queensland Government's recent 'Affordable Housing Strategy' – QHAS - (*Queensland Housing Affordability Strategy*, 2007) 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.

The importance of the calculation has recently been the subject of considerable political debate. In the case of Queensland, it has been an integral part of the Housing Affordability Strategy, spearheaded by the Housing Affordability Fund which has been announced to provide an investment of $512 million over the next five years[4] to lower the cost of building new homes. In addition to the offset of infrastructure costs, the fund has been mooted to address "significant barriers to the supply of housing development" (*Easing Pressure on Housing Affordability - Media Release*, 2008) which includes holding costs – defined as being those costs incurred by developers as a result of long planning and approval waiting times. This announcement states that up to $30 million will be used to develop IT infrastructure and software to roll out nationally, electronic development assessment systems and online tracking services to reduce red tape and streamline planning approvals.

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

[4] The Fund has been announced by the Rudd Government as part of their total commitment to the Housing Affordability Fund which amounts to $512 million over a five year period, with $359 million allocated in the next four years.

- 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 summarised in the table below:

Per Lot Basis			BASE CASE SCENARIO		
Assessment time (months) for Planning & Building Consents including DA	0	12	18	24	36
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
	$38,625	$38,625	$38,625	$38,625	$38,625
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	$75,000	$75,000	$75,000	$75,000	$75,000
Interest Costs on development	$1,964	$3,980	$5,008	$6,049	$8,171
Total Development costs including interest	$81,804	$88,973	$92,703	$96,535	$104,523
Total Costs of Development including acquisition costs	$120,429	$127,598	$131,328	$135,160	$143,148
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	$151,307	$160,314	$165,000	$169,815	$179,851
TOTAL HOLDING COSTS FOR PROJECT	$5,441	$11,245	$14,294	$17,444	$24,069

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. Alternatively, 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 approximately an 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

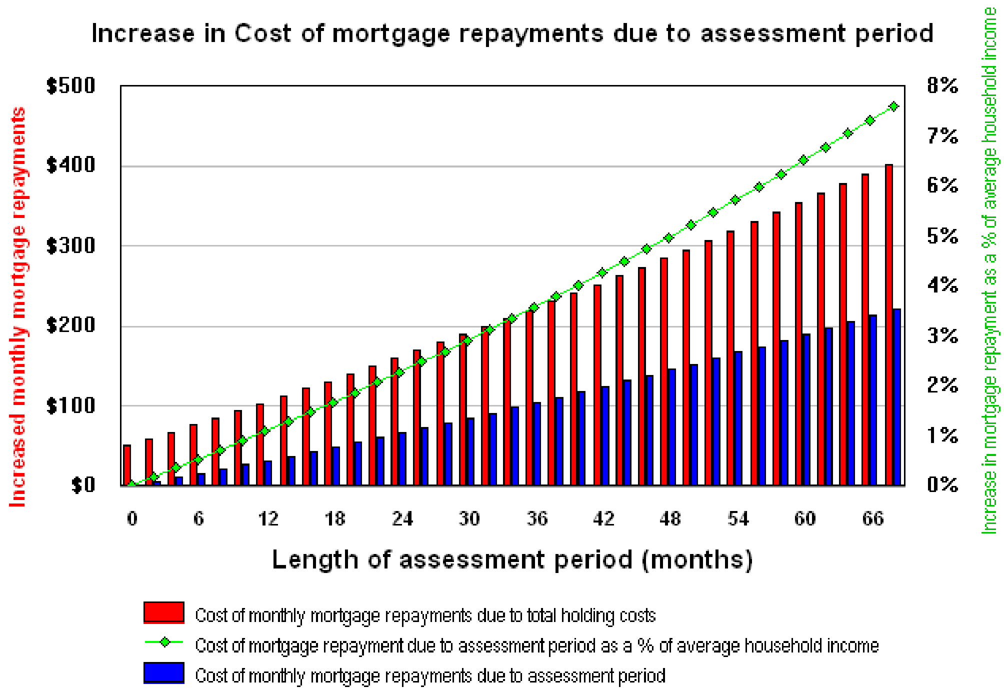
Time (Months) - Planning & Building Consents including DA	0	12	18 (Base Case)	24	36	48	60	68
Total Costs of Development including acquisition costs	$120,429	$127,598	$131,328	$135,160	$143,148	$151,597	$160,545	$166,807
Gross realisation required	$151,307	$160,314	$165,000	$169,815	$179,851	$190,467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

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. If the assessment period becomes extended for any reason, there is a commensurate impact on additional holding costs.

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 (especially first home buyers) 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 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[5]), 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.

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

5 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.

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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