
© Copyright 2009 Gary O. Garner
Abstract - It is widely held that strong relationships exist between housing, economic status, and well being. Therefore, recent events emerging from the United States, culminating in widespread housing stock surpluses in that country and others, threaten to destabilise many aspects related to individuals and community. However, despite global impact, the position of housing demand and supply is not consistent. The Australian position provides a strong contrast whereby continued strong housing demand generally remains a critical issue affecting the socio-economic landscape. Underpinned by strong levels of immigration, and further buoyed by sustained historically low interest rates, increasing income levels, and increased government assistance for first home buyers, this strong housing demand ensures elements related to housing affordability continue to gain prominence. A significant, but less visible factor impacting housing affordability – particularly new housing development – relates to holding costs. These costs are in many ways “hidden” and cannot always be easily identified. Although it is only one contributor, the nature and extent of its impact requires elucidation. In its simplest form, it commences with a calculation of the interest or opportunity cost of land holding. However, there is significantly more complexity for major new developments - particularly greenfield development. Analysis suggests that even small shifts in primary factors impacting holding costs can appreciably affect housing affordability. Those factors of greatest significance not only include interest rates and the rate of inflation, but even less apparent factors such as the regulatory assessment period. These are not just theoretical concepts but real, measurable price drivers. Ultimately, the real impact is felt by the one market segment whom can typically least afford it – new home, first home buyers. They can be easily pushed out of affordability. This paper suggests the stability and sustainability of growing, new communities require this problem to be acknowledged and accurately identified if the well being of such communities is to be achieved.

Keywords - Holding cost, housing affordability; planning; assessment period; opportunity cost

I. INTRODUCTION

Understanding the nature and composition of holding costs applying in residential property markets (particularly greenfield development) provides a basis for understanding the impact of indirect regulatory costs – in particular, costs which may be associated with the length of the regulatory assessment period. Since this in turn impacts the cost of housing, examination of these linkages therefore has potential to provide greater exposition of housing affordability equations.

This paper further develops previous modelling by the author (Garner, 2008) that quantifies the impact of holding costs on housing affordability. It has a particular focus on the consequences of extended assessment periods as a component of holding costs. Thus, clarification as to the impact of holding costs on overall housing affordability is provided.

Understanding this effect complements other research recently emerging in the area of statutory urban planning economic impacts. For example, a recent study (Gurran et al., 2008) examined the “…often unpredictable costs that arise from planned intervention in the land and housing market, direct costs associated with complying with building and design controls, time taken to secure approval, and fees and charges for administration, infrastructure or other public services associated with development”. The Gurran study was predicated on an observation that little attempt has been made to quantify the direct costs to housing development arising from government taxes and planning regulations. However, this lack of quantifiable data applies even more so in the area of indirect costs. Yet it is
hypothesised that it is these costs which may have the greatest impact.

This position is supported by a PCA report (Reasons to be fearful? Government taxes, charges and compliance costs and their impact on housing affordability. Residential Development Costs Benchmarking Study, 2006) which strongly challenges conventional thinking that housing prices are primarily driven by issues such as interest rates, supply and demand, and consumer confidence. It found that the combined impact of various government costs represents the second most expensive part of the cost of developing new housing product (more costly even than the land). This report also observes a steep rise in the tax and compliance bill for new home buyers, particularly since 2000. These costs have been identified as not only being the more visible costs such as new and increased infrastructure charges and rising compliance costs, but also the less visible holding costs caused by excessively complex development assessment procedures, lengthening delays by statutory bodies, and other related factors.

Another PCA report investigated changes in infrastructure charges in Brisbane, Sydney and Melbourne between 1995 and 2006 (National Housing Infrastructure Costs Study, 2006). Total infrastructure charges for new houses in Brisbane (Forest Lake) were estimated at $17,128 in 2006, a 279% increase from 1995, or 145% above the rate of inflation. This study claimed to examine how government imposed infrastructure charges impact house and land prices and hence affordability. However, in this instance, “indirect” infrastructure costs did not include holding charge calculations. Rather, this referred to infrastructure charged for but which is not ‘essential’ to the delivery of a home site (for example, an infrastructure feature which is of benefit to a broader community).

It is subsequently noted that some ambiguity exists in terms of the contribution of various costs. This is recognised by the Local Government Association in their report (Breakdown of Housing Costs in South-East Queensland, 2008) whom calculate that whilst house construction is the largest cost component (at 41-43% on average), finished land costs, comprising undeveloped land purchase and development costs is the next largest at 20-21% on average, with infrastructure charges, comprising water, sewerage, stormwater, transport, community and parklands contributions, are estimated at 4% on average. However, the calculation of holding costs is not undertaken in this and other similar studies. Therefore, in relation to elements related to holding costs, significant questions arise particularly in relation to determining the size of their impact. Other matters requiring clarification include to what extent are regulatory controls or assessments a contributor of total holding costs? Can the effect of these elements be measured in terms of impact on the end user? Is it therefore possible to model the impact of holding costs upon affordability? What are the implications for regulatory authorities?

Although the extent to which the assessment period as a contributor impacting housing affordability has yet to be fully established, the policy implications for this research influence changes to the framework used in Australian jurisdictions. These changes potentially have a profound effect on the promotion or retention of affordable housing. Therefore, quantification of the impacts of holding costs, focussed on the timing of assessment periods has relevance. Its identification potentially maximises the opportunities for delivering affordable housing in Australia.

This research ultimately seeks to identify which (if any) part of the holding cost matrix links to public or private planning or statutory instrument or instruments best capable of supporting, or alternatively negatively impacting, affordable housing concepts.

II. METHODS

This paper examines the complex issue of housing affordability specifically in association with holding costs. However, it is acknowledged that housing affordability has many facets requiring a multi-dimensional approach. Whilst recognising that holding costs are only one contributor, it is nevertheless considered a potentially significant element and therefore worthy of separate investigation.

Geographically, there is considerable variation between various planning instruments and the length of regulatory assessment periods. This implies the need for a case study approach. However, in this instance the development of a theoretical model is attempted prior to field testing.

Research that identifies linkages between the timeliness of regulatory assessment, and any ensuing apparent financial impacts, are

1 Property Council of Australia - Residential Development Council – independent report prepared by consultants UrbisJHD
established via literature review. This is focussed on both holding cost theory and the other primary drivers of housing affordability. Evidentiary links between regulatory assessment, holding costs and housing affordability are examined.

The literature review provides a background to modelling of assessment periods against various holding cost elements (and/or the total quantum of holding costs) via spreadsheet scenario analysis. Testing the impact of the major drivers of holding costs seeks to clarify the impacts on housing affordability. The primary assumed independent variables, including interest rates (in particular), and the passage of time, can be examined and a comparison of outcomes made.

It is at this point that the additional costs of holding can be expressed in terms of additional mortgage repayment required to cover those costs. This amount can be further converted into a proportionate amount of average household income. In this way, calculated amounts can be applied against the “30/40 affordability rule” or other commonly used measures that identify impact against housing affordability.

This paper stops short of providing additional statistical analysis capable of presenting predictive models that reliably quantify the impact of planning delays, and other holding cost variables, based on various group relationship data. However, subject to field testing, it may be anticipated that such models could be readily developed as a result of this initial research.

III. RESULTS

Only some of the various elements of holding cost have been examined. The measurement of opportunity cost provides a preliminary assessment of the possible linkages with regulatory assessment periods and their impact. It is recognised that ambiguities potentially emerge where a distinction between the strength, as against quantum, of regulation, occurs: there can be opposing effects.

In terms of impact upon affordability, it is useful to firstly establish the quantum of additional costs that extended assessment periods will cause. The impact upon the end-purchaser (whom ultimately bears this cost) can then be examined on the basis of increased mortgage repayments required to cover these additional costs. The rationale here is that new home buyers typically obtain finance to complete their purchase – therefore, if the cost of acquisition rises, then so does their mortgage. i.e. total costs of these mortgage repayments over the life of a “typical” loan period.

Finally, 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”.

The results of this model, and the resultant impacts on affordability are summarised at Table 1. The model developed assumes a base case scenario of 18 months assessment time (planning and building consents, including Development Approval DA) resulting in a total holding cost for a typical 200 lot project in south-east Queensland of approximately $14,300 per lot. This calculates out at a gross realisation of $165,000 based on a 20% developer’s margin. It assumes a prevailing interest charge of 9% effective annual rate, and a timeframe of 3 months for debt/equity raising by the developer, and 9 months construction and development period. Other assumptions have been made concerning undeveloped land cost, various acquisition costs, rates, special council charges and land tax, development costs and selling costs (however, it should be noted that the model demonstrates relatively weak sensitivity to changes in these assumptions, excepting development costs which are calculated at $75,000 per lot for the purpose of creating a base case scenario).

![Sensitivity of Time on a Land Development Project](image)

**Figure 1 - Sensitivity of Time**

As Figure 1 demonstrates, holding costs rapidly rise from the aforementioned $14,300 to $24,000 for a 36 month assessment period, or just under $40,000 per allotment for a 60 month assessment period.

These costs can be converted to additional mortgage repayment equivalent required to cover these additional costs, as shown in Figure 2 below:
For our 18 month base case scenario this is equivalent to $130 per month for all holding costs, or $49 per month to cover the costs of the assessment period alone. If the assessment time is extended to say 36 months it will add $89 per month additional mortgage repayment due to the extended assessment period (total holding costs actually add a total of $220 per month in mortgage repayments), equating to $21,416 over the life of a typical loan period of 20 years. If the assessment time extends to 60 months, the cost of mortgage repayment rises to $354 per month due to total holding costs ($190 per month for costs associated with the assessment period only).

Finally we can examine the above results in the light of additional costs of mortgage repayment (as a result of extended assessment period) as a percentage of average household income. In this instance the amount for our base case scenario (18 months assessment period) would be 1.67%. The overall cost of mortgage repayment required to cover an assessment period of 36 months is 3.57% of average household income, rising to 6.51% for a 60 month assessment period. The impact of even lengthier assessment periods accelerates as time proceeds as demonstrated thus:

Table 1 summarises results obtained for selected time periods. However, It should be noted that the cost percentages of average household income would be even higher for those in the bottom 40% of household income distribution - in concert with the “30/40 affordability rule”.

It may therefore be concluded that even small shifts in assessment period can significantly affect housing affordability. It emphasises the need for timely processing by regulatory authorities, advocating a streamlining of those processes likely to simply add a quantum of time without any strengthening of positive outcomes.

This preliminary research could be further developed with additional market and non-market variables examined. Their impact on housing affordability could then be assessed in the context of analysing the impact of holding costs in greater detail. Further analysis is also required across multiple regional areas, cross-referencing with a rigorous international comparison study conducted over time.

**Interest Rate Impact**

The model indicates significant sensitivity to the rate of interest and its impact over time. This is
logical since it is interest rate equivalent that underpins the holding cost calculation.

This is demonstrated by comparison of our base case scenario which is predicated on the basis of an interest rate of 9% effective per annum. Based on a 5 year assessment period, should this rate increase to 12% then the holding cost charge rises from $354 per month monthly mortgage equivalent (representing 6.5% of household income), to $432 per month which is slightly under 8% of household income. The curve is logarithmic since the impact becomes more pronounced as the interest rate increases. For example, at an extreme of 20% interest charge, the holding cost charge rises to $663 per month monthly mortgage equivalent or 12.2% of household income.

This effect may be seen at Figures 4 and 5 below:

![Figure 4 - Increase in cost of mortgage repayments and impact on housing affordability: Interest rate effect @12% p.a.](image)

![Figure 5 - Increase in cost of mortgage repayments and impact on housing affordability: Interest rate effect @20% p.a.](image)

The effect of such a large interest rate variation is significant even at more modest levels of assessment periods. For example, even at the level of our base case scenario (18 months) the cost of mortgage repayment as a result of assessment period as a % of average household income rises from 1.67% through 2.74% to 7.13% at interest rate levels increasing 9% through 12%, to 20% per annum.

It may therefore be concluded that even small shifts in interest rates can significantly affect housing affordability especially for new home buyers – not only because it represents an obvious increase in mortgage repayments more generally - but because of holding cost impact and the subsequent increase in mortgage repayments required to cover that additional cost. It demonstrates the inherent risk (especially for low income households) of entering variable rate transactions in low interest rate environments. The buyer is even further exposed to the potential for housing stress where income levels are static or falling since this becomes unbalanced in the event of even small “corrections” occurring with prevailing market rates.

IV. RELATIONSHIP BETWEEN HOUSING AFFORDABILITY & DEMAND

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 household incomes
- schemes designed, or public policy that has the effect of encouraging and supporting new home buyers, particularly first home buyers (many of these buyers are new entrants to the market, especially in Queensland and Western Australia where net immigration levels are relatively high)
- increased relative attractiveness of real estate property as an investment

The literature establishes strong links between population, housing demand, commerce industry and employment. All these factors in turn relate strongly to the issue of housing affordability. The traditional supply / demand curve has a few nuances however when related to real estate. For example, in the case of property, it may be seen that whilst outward shifts in the demand curve causes price increases, the ability of supply to respond quickly is limited since it takes time to develop land for housing and to construct houses. This general principle of demand and supply is commonly held by property economics
commentators. The determination of property demand also takes into account other factors including the age, size, income and other characteristics of households (Reed, 2007); in the case of commercial and industrial property, demand might also be created by a population’s requirement for the goods and services to be produced or distributed at these sites.

The demand / supply equation must also take into account the aspect of human nature itself. We are reminded of this in a recent study which suggests that housing prices are “better explained in terms of human behaviour and social changes than by mere trend analysis” (Small, 2009). The implication that there are strong connections between social dynamics of the household and economic behaviour further complicates the housing affordability equation. This appears to have been recognised by other commentators determining that household lifecycles and behaviour are strongly relevant factors in relation to housing affordability. For example a recent AHURI report (Wood & Ong, 2009) found that residential moves made by households during a spell living in affordable housing are associated with the onset of housing affordability stress because these moves tend to involve trading up in the housing market. This latter report also found that precarious housing affordability circumstances are particularly evident among younger couples with dependent children, a stage in the life cycle that is associated with pressing spending needs.

V. RELATIONSHIP BETWEEN HOUSING AFFORDABILITY & TIME

The extent to which time impacts a project varies considerably. 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. In the context of housing affordability 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.

A lot of attention has been given to various aspects of housing affordability including some concern being expressed as to how government planning processes might be impacting this. For example, AHURI² is currently looking at the cost effect of planning regulations and charges on house prices and affordability in Australia (Randolph, 2007). This project is attempting 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.

VI. CHALLENGES IN THE MEASUREMENT OF HOUSING AFFORDABILITY IN AUSTRALIA

The extent of the housing affordability problem in Australia has been recently highlighted by a number of Industry Reports, perhaps one of the most publicised being the Annual Demographia International Housing Affordability Surveys (Cox & Pavletich, 2006, 2007; Cox & Pavletich, 2009). These surveys employ the “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

---
² Australian Housing and Urban Research Institute
3.0 or Less, to “Severely Unaffordable” at 5.1 &
over.

The Demographia Report comments that in recent
decades, the Median Multiple has been proven
remarkably similar among the nations surveyed,
with median house prices being generally 3.0 or
less times median household incomes. This
historic affordability relationship has continued in
many housing markets. However, the latest
Demographia Report (Cox & Pavletich, 2009)
states that over the past year, house prices have
decreased in most markets. This “bursting of the
housing bubble” followed an unprecedented
increase in housing prices in all markets except
some in the United States and Canada. The result
is that housing affordability has generally
improved, though remains at Median Multiples
well above the historic norm in many markets.

Nonetheless, Demographia in their latest survey
indicate that the least affordable markets (denoted
“Severely Unaffordable”) remain generally in
Australia, Canada’s province of British Columbia,
New Zealand, the United Kingdom and
California. Interestingly, the Report
acknowledges “considerable intellectual progress”
having been made Australia and selective
locations elsewhere, as an increasing number of
analysts and public officials have recognized the
nexus between prescriptive planning and higher
house prices. Furthermore, whilst 2008 saw the 5
least affordable markets in the United States, this
year, 3 of the least affordable markets are in
Australia and only one in the United States. The
reason for this change is explained as being the
result of the steep housing price declines that have
been experienced in some markets in the United
States, especially California.

An alternate, perhaps more traditional and
simplified approach towards measurement of
housing affordability is a calculation 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”.

Whilst the “30/40 affordability rule” definition is
certainly a convenient guideline, it has its
shortcomings. One major criticism is that 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 variables are defined.
The NSW Centre for Affordable Housing also
cautions against using such formulas that are
sometimes used to describe housing affordability.

Furthermore, the incidence of housing stress may
only represent a short term phenomenon for some.
Colloquially put, the cliché of a short term pain
for a long term gain (Karantonis, 2009) has been
described where the pain of affordability stress
ultimately becomes a gain due to an increase in
wealth especially as household incomes
eventually rise over time.

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.

VII. HOLDING COSTS IMPACT ON
LAND VALUE & THE CRITICAL
ELEMENT OF TIME

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

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”.

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. 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? 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.

**Calculating Holding Costs**

The foregoing infers that holding costs represent a major determinate of value. Although sometimes considered a “hidden”, it is nonetheless often pervasive. It is asserted by the sector (Gurran et al., 2008) that taxes, levies and compliance costs now amount to about a third of the cost of new house and land packages, including costs of meeting planning regulations and holding costs associated with the approval process. This includes land supply decisions of State or local governments, complexities or delays in the planning process, and the scale and complexity of developer contributions. It therefore affects housing affordability, the actions of repossessors, and the profitability of developers.

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.

The EOQ model therefore forms the basis for examining the cost of holding money. This relies upon the concept of opportunity cost involving 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”.

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. Determining the cost of holding 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 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.

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). 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).

**Consideration of Holding Costs Under the Queensland Housing Affordability Strategy**

Quantifying holding costs and other costs associated with delays in obtaining assessment and approvals, can be complex depending on the Project and the variables applying in particular circumstances. Elliott (Elliott, 2007) calculates that tax and regulatory charges accounted for 26% of the purchase price of $579,000 in the case of a specific Queensland development project. He points out that excessive delays and massive court costs all result in excessive holding costs. Elliott also cites the state Government’s “Queensland Housing Affordability Strategy” (QHAS) which acknowledges holding costs due to these delays adding $20,000 per unit to the end price (he believes this is a conservative figure – additional comments follow). 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).

Nonetheless, the concept of bringing greenfield land into development ahead of time frames is well entrenched within the QHAS. This strategy recognises that holding costs in the case of new land or greenfield development, potentially represents a significant cost that is ultimately borne by consumers (end purchasers). This approach of the QHAS, at least theoretically, is to counter this effect by enabling land to be brought onto the market in the short to medium term, increasing market competition and choice (South East Queensland Infrastructure Plan and Program 2009-2026, 2009). 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). The QHAS recognises that this cost 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 been the subject of considerable political debate particularly during 2008. In the case of Queensland, it has been an integral part of the Housing Affordability Strategy, which is itself embedded with the South East Queensland Regional Plan. It is stated within the Plan that the strategy will ensure state land and housing is brought to market quickly and at the lowest cost (South East Queensland Regional Plan 2009-2031 2009). This is to be achieved by "reducing the timelines and associated holding costs of bringing new housing to the market". A more
competitive and responsive land and housing market is the intention.

The QHAS is spearheaded by the Housing Affordability Fund which has been stated to provide an investment of $512 million over the next five years\(^3\) 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” (Taylor, 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.

**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 opposite 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.

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.

*Regulatory Assessment as a Component of Holding Costs*

The quantum of time taken by regulatory authorities to assess and consider applications for a particular development is considered to represent part of the holding cost calculation. In many instances it can be demonstrated to represent the major component of holding costs. Regardless, 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.

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

---

\(^3\) 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.
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 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 always establish itself as a holding cost.

(VIII) AN PRELIMINARY ECONOMIC MODEL EXAMINING THE EFFECTS OF TIME FOR A PROPERTY DEVELOPMENT PROJECT

Base Case Scenario – Assumptions

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. (The calculated outcomes of this model are summarised earlier at the “Results” section of this report).

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. It is considered to be representative of a realistic operating scenario, against which various “what-if” scenarios can be modelled. The results of these alternate scenarios, based on various time periods taken for assessment of planning and building consents (including DA), is summarised in the tables below:
### 36 month “Base Case” Model

#### BASE CASE SCENARIO

**Assumptions used**

<table>
<thead>
<tr>
<th>Interest rate (cost)</th>
<th>9.00% per annum</th>
</tr>
</thead>
</table>

**Per Lot**

<table>
<thead>
<tr>
<th>Development Timing:</th>
<th>Base Case</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identification of suitable site and site purchase</td>
<td>0.00 months</td>
</tr>
<tr>
<td>Planning &amp; Building Consents including DA</td>
<td>18.00 months</td>
</tr>
<tr>
<td>Funds raising (debt and / or equity)</td>
<td>3.00 months</td>
</tr>
<tr>
<td>Construction and development</td>
<td>9.00 months</td>
</tr>
<tr>
<td>Other</td>
<td>0.00 months</td>
</tr>
</tbody>
</table>

**TOTAL development time from acquisition**

| 30.00 months |

| Undeveloped Land Cost | $7,500,000 |
| Acquisition costs | $225,000 |
| **Total Acquisition Costs** | $7,725,000 |

**Loss of Interest over a development period of 30 months**

| Number of lots | 200 |
| Rates, special council charges and land tax say (% of acquisition and land costs per lot p.a.) | 3.53% |
| Development Costs, say | $75,000 per lot |
| Interest Costs on development - based on (% of total development period) | 30% |
| = 9 months @ 9% | $1,001,516 |
| **Total Development costs including interest** | $18,540,533 |
| **Total Costs of Development including acquisition costs** | $26,265,533 |
| Developers Margin | 20% of Total costs |
| **Sale price before selling costs** | $31,518,639 |
| Selling Costs | 4.7% |
| Gross realisation | $33,000,016 |
| **TOTAL HOLDING COSTS FOR PROJECT** | $2,858,705 |
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. Sufficient 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, e.g. if the time taken for assessment exceeds 5 years, the model demonstrates that holding costs could climb to $40,000 per lot and beyond. This would effectively raise the average cost of each allotment from $165,000 (Base model assumption) to over $200,000.

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

Ultimately the impact of increased holding costs will rest 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, for most purchasers this implies increased mortgage costs. Such consumers are therefore potentially pushed into the realms of un-affordability. Therefore, measuring this impact can be achieved by calculating 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”.

The outcome of this model and the measureable impacts on affordability are summarised at the results section of this Report. It demonstrates that the assessment period is a very sensitive factor affecting housing affordability.

**IX. REFERENCES**


**Author Biography**

Gary Garner, male, Curtin University of Technology, Bachelor of Business (Economics & Finance), Lecturer Property & Urban Development & Coordinator, Property Economics (Postgraduate), Infrastructure Research Theme. Faculty of Built Environment & Engineering, Queensland University of Technology, 2 George Street, Brisbane | GPO Box 2434, Brisbane, Queensland, 4001, Australia.