HOLDING COSTS

HOUSING AFFORDABILITY OUTCOMES FOR GREENFIELD RESIDENTIAL PROPERTY DEVELOPMENT

THE DYNAMICS OF HOLDING COSTS

In greenfield residential property developments, it is generally accepted that aside from the cost of the undeveloped land and subsequent direct development costs (building and construction), development cost contributions expended towards infrastructure typically represent the largest planning-related cost. However, it may be demonstrated that holding costs (i.e. essentially those costs revolving around an assessment of 'carrying costs' related to capital and other outlays) not only rival, but typically even exceed apparently more pervasive, obvious costs involved in property development.

Of particular significance is that together with non-financial barriers, these costs are being increasingly recognised as significant impactors in relation to housing affordability. Such costs arise from inconsistent planning requirements, development assessment procedures and conflicts between developers and local councils. Their impact has underpinned a diverse range of planning reforms currently underway in various regions throughout Australia. Examples include systematic enhancements intended to provide greater standardisation and reduced administrative requirements, system complexity and timeliness.

It is indisputable that developer infrastructure costs strongly impact housing costs and therefore affordability, and compared to holding costs, they are much more visible and easily quantified. In contrast, holding costs may seem less tangible as they typically stem from issues revolving around uncertainty, timeliness and inconsistency. Nonetheless, it can be established that they represent a potentially formidable financial barrier. As a consequence, the impact of holding costs emphasises the financial benefits arising from planning reform and intervention.

Whilst this research involves investigation of the dimensions of holding costs based on data largely derived from case study investigations originating from midsized to larger (up to 200 lot) residential greenfield property development in South East Queensland, theoretical modelling strongly suggests that the outcomes have application outside this specification.

HOLDING COSTS AND THEIR EMERGING SIGNIFICANCE

Despite the quantum and high economic impact of related statutory intervention by policy makers, only limited formalised research into the impact of holding costs on housing affordability has been hitherto undertaken in Australia. At the very least, a better understanding is required (Gurran et al., 2009; Matthew et al., 2010; Randolph, 2007; UDIA, 2010; ULDA, 2010).

One of the main difficulties in conducting research in this area is due to the lack of baseline information – i.e. highly sensitive commercial-in-confidence data that is tightly held by major industry players (a problem well documented by researchers, such as Gurran et al., 2009). Furthermore, there has been little evidential material identifying to whom the burden of these effects are passed.

Holding costs are nevertheless emerging as an important factor impacting housing affordability, having particular application in the case of new housing greenfield development. The fact that holding costs are widely held to impact housing affordability is well established in the literature (Barnes, 2007; Bourassa, 1992; Brown et al., 1986; Çorbacıoğlua & van der Laan, 2007; Eagles, 2008; Gurran et al., 2009; Tse, 1998; ULDA, 2010; Yardney, 2007).

The Queensland Housing Affordability Strategy (QHAS) calculates that development holding costs typically add at least $15,000 to $20,000 per dwelling for greenfield developments (Queensland Housing Affordability Strategy, 2007, p. 3). Until now this has never been seriously challenged. It is therefore important to authenticate not only the quantum amount, but also the extent of their significance – especially where time taken for regulatory assessment is excessive. The perception that land use planning requirements and government taxes are increasingly responsible for the rising costs of residential development and consequent housing unaffordability (Gurran et al., 2008) therefore requires scrutiny.

The reason why these matters are of significance is because of the implications for public policy and the associated potential (in association with other factors outside the scope of this study) for the development of a strategic jurisdictional framework likely to promote or assist housing affordability.

CASE STUDY PARTICIPANT INVOLVEMENT AND RESEARCH METHODOLOGY

Having developed a theoretical model for the calculation of holding costs, information derived from actual mid-sized to large greenfield property developments is used to cross check for authenticity. In this instance, participants consist of property development organisations which have been engaged in mid-sized to large-sized projects in South East Queensland – i.e. between 15 to 200 residential allotments in the total development.

IT IS INDISPUTABLE THAT DEVELOPER INFRASTRUCTURE COSTS STRONGLY IMPACT HOUSING COSTS AND THEREFORE AFFORDABILITY, AND COMPARED TO HOLDING COSTS, THEY ARE MUCH MORE VISIBLE AND EASILY QUANTIFIED

Developments outside this range are unlikely to be compatible. For example, smaller 'six-pack' and 'eight-pack' developments are niche market property developments likely to exhibit characteristics peculiar to that distinct style and size of development. On the other hand, larger developments are likely to exhibit different sets of characteristics common to very large or even state significant projects.

Such large-scale developments are more specialised and research has shown (Garner, 2008) that projects of state significance often mean that they are more susceptible to manipulation by non-economic parameters, especially political and other behavioural influences. For example, special treatment by regulatory authorities, particularly in terms of environmental compliance and certain economic and other government support measures. Restricting and stratifying the data sets in the manner described therefore maximises the potential collegiality and homogeneity of data sets since the information is derived from congruent geographic areas and development sizes less susceptible to non-economic influences.

In accordance with methodology similar to that developed over recent years by AHURI (Gurran et al., 2008), developers were asked to provide financial data which was compiled and analysed against standard development costings methodology, along with expenditure associated with planning approval and expenditure. Obtaining both types of cost data (pre-development feasibility estimates, where available, and actual expenditure) allows the exploration of shifts in planning requirements and development contribution

TABLE 1 - SENSITIVITY OF TIME ON A DEVELOPMENT PROJECT – GROSS REALISATION REQUIRED TO COVER HOLDING COSTS (PER LOT BASIS)

PER LOT BASIS							
Statutory planning/subdivision, including DA (months)	0	12	24	36	48	60	N/A*
Total development time from acquisition (months)	12	24	36	48	60	72	84
(years)	1.0	2.0	3.0	4.0	5.0	6.0	7.0
Total development costs, including interest	$81,795	$90,778	$105,126	$120,999	$138,559	$157,987	$179,481
Total costs of development, including acquisition costs	**$120,458**	**$129,440**	**$143,789**	**$159,662**	**$177,222**	**$196,649**	**$218,143**
Developer's margin	$24,092	$25,888	$28,758	$31,932	$35,444	$39,330	$43,629
Selling costs	$5,544	$5,958	$6,618	$7,349	$8,157	$9,051	$10,040
Gross realisation	**$150,094**	**$161,286**	**$179,165**	**$198,943**	**$220,823**	**$245,030**	**$271,812**
TOTAL HOLDING COSTS	**$3,702**	**$9,592**	**$20,847**	**$33,627**	**$48,094**	**$64,429**	**$82,830**
n/a* not applicable – statutory approval times in this timeframe is unrealistic							

levies between project inception, the lodging of development applications, determination and approval and the capacity to accurately estimate and cost planning requirements at project feasibility stage.

Case study investigations assist the quantitative data modelling by providing 'live data' for input into the theoretical modelling of holding costs and testing the ability of it to capture all possible project variations and financial/physical combinations across a range of scenarios. It also facilitates changes to be made to the structure of the model and provide a means to check the componentry aspects of holding costs, as well as ensuring that the output of the model is consistent and logical.

The case study projects range in size from 17 to 142 allotments, with their scope ranging from $1.3 million to $23.4 million, with the cost of greenfield site acquisition ranging from $0.1 million to $7.2 million. Average gross realisations (i.e. the final sale prices for the allotments) range from $86,621 to $521,303 per allotment. Development timeframes range from 28 months to 52 months. Accordingly, it may be appreciated that there is considerable variability in the case studies.

QUANTUM OF HOLDING COSTS DETERMINED

The theoretical model ('holding cost economic model') indicates total holding costs for a typical 'base case scenario' is $15,039 per lot (refer to Table 3). This amount tends to confirm Queensland Housing Affordability Strategy (QHAS) estimations suggesting that development holding costs can add between $15,000 and $20,000 per dwelling.

However, results for alternate timeframes indicate significant volatility. For example, if the time taken for completing a development is reduced by six months, the holding costs will reduce by 36.2% to approximately $9,600 per lot, and if time is increased by six months, the holding costs will increase by 38.6% to approximately $20,800 per lot.

Put simply, for every month the assessment time is delayed, the end-user (whom ultimately incurs the holding costs) will pay more than $800 more, equating to around $5,000 for every six months differential. If any of the assumptions used vary, then there will be a commensurate (or more usually accentuated) impact on the project. Those assumptions (independent variables), having the greatest singular impact, include interest rates and development timing (incorporating holding period). Initial acquisition costs and the developer's margin tend to be a function related to gross realisation expectations.

Furthermore, the effect of extended timeframes rapidly accelerates holding costs over time. For example, as shown in Table 1, holding costs rise by 123.6% to nearly $34,000 per allotment where there is a four-year total development period or by 328.4% to just more than $64,000 for a six-year development period. Regardless of whether the fundamental cause of excessive time delay is due to the assessment period or not, the model demonstrates how readily holding costs can climb to these levels – and beyond. The ultimate impact is highlighted by examining gross realisation where, assuming a total development period rises to five years, the average

cost of each allotment is effectively raised from $170,000 (base model assumption) to more than $220,000.

In order to assess the impact on housing affordability, the quantum of holding costs can be converted to a mortgage repayment equivalent required to cover these additional costs (i.e. the additional costs of holding can be expressed in terms of additional mortgage repayments required to cover those costs). This amount can be further converted into a proportionate amount of average household income.

In this way, calculated holding cost amounts can be directly applied against the '30/40 affordability rule' or other commonly used measures that identify impacts against housing affordability. For example, reverting to our base case scenario, the holding cost amount of $15,309 can be expressed as being equivalent to a mortgage payment of an additional $154 per month to cover all holding costs or $55 per month to cover the costs of the assessment period alone. Expressed as a percentage of average household income, the amount of total holding costs for our base case scenario would be 3.58%, of which 1.27% is contributed by the assessment period. The impact of even lengthier assessment periods accelerates as time proceeds (i.e. accelerating the increase of mortgage repayments due to holding costs over time).

TABLE 2 - SENSITIVITY OF NINE FACTORS IMPACTING HOLDING COSTS AND SUBSEQUENT EFFECT ON HOUSING AFFORDABILITY

SENSITIVITY ASSESSMENT	ANGLE (SLOPE)	VARIABLE
Very extreme	>10 °	• Interest/inflation rate change
Extreme	7-10 °	• Mean equivalised household income • Development time from acquisition
Significant	4-7 °	• Undeveloped land cost • Number of lots in subdivision
Moderate	1-4 °	• Development costs, including major civil works, building and construction - per lot
Minor	up to 1 °	• Rates, infrastructure charges, DA, consultants, etc - % land acquisition costs per lot p.a. • Acquisition costs (% of undeveloped land cost)
Nil	zero °	• Developer's margin

VOLATILITY OF HOLDING AND OTHER MAJOR DEVELOPMENT COSTS

Perhaps surprisingly, a comparison of the variability of holding costs apparent amongst case studies indicates relative non-volatility. They account for up to approximately 12% of all costs in the case studies with a standard deviation σ of only 3.41% (by way of comparison, development costs account for up to approximately 64% of all costs in the case studies with a standard deviation σ of 11.06%).

For a 95 per cent confidence level α=0.05 the population mean for holding costs of 6.08% has a confidence interval $\hat{p}$ of only ±5.96% (or in other words we can be 95% confident that the interval from 0.12% to 12.04% contains the true value of p). This may be referenced against the actual holding costs for the case studies, which range between $5,006 and $32,941 per lot (i.e. accounting for between 4.25% and 12.05% of gross realisation), whilst development costs range between $55,000 and $227,824 per lot (accounting for between 38.7% and 64.2% of gross realisation).

It is important to note here that those cost components which have the greatest level of volatility and variability (in order of variability – development costs, developer's margin and acquisition costs) are also, especially by comparison with holding costs, at least directly affected by increases in interest rates and time. This is quite apart from their overall significant impact on gross realisation.

HOLDING COSTS ARE NEVERTHELESS EMERGING AS AN IMPORTANT FACTOR IMPACTING HOUSING AFFORDABILITY, HAVING PARTICULAR APPLICATION IN THE CASE OF NEW HOUSING GREENFIELD DEVELOPMENT.

FACTORS CRITICAL TO THE HOLDING COST EQUATION

'Best fit' trend equations may be established for each of the case studies based on the dependant variable *y* (measured by the mortgage repayment equivalent as derived from the quantum of holding costs, expressed as a percentage of mean household income) and the independent variable *x*, being the length of development period. A 'Holding Cost – Housing Affordability Trend Line' can be achieved by inputting the actual results for each specific property development project into the Holding Cost Model. It is then possible to run the best fit linear or non-linear trend analysis on the Holding Cost – Housing Affordability Trend Lines, which in this case results in polynomial regression equations which are summarised in Table 3. Here, polynomial regression equations are used to solve the housing affordability variable y.

An assessment of sensitivity of factors impacting holding costs and the subsequent impact on housing affordability can be gauged by measuring the angle of the slope of the equations referred to. The results are summarised in Table 2, which demonstrates that interest rates and development timeframes are critical to the holding cost equation. This confirms the general thrust of the literature on that topic, yet perhaps highlights that the extent of these impacts may not have been fully appreciated.

It should be noted that although some of the variables have limited or no impact on holding costs (as measured by the sensitivity assessment), that does not mean they have a correspondingly limited impact on housing affordability. This is important since a factor could have a limited or even no impact on holding costs, yet have a significant impact on housing affordability because it affects gross realisation prices. A good example of this is the developer's margin – it has no impact on holding costs at all, yet could be significant for end-users.

CONCLUSION

This study has established that the impact of holding costs on housing affordability is not only profound, but also exceedingly variable. In the case of a residential development in South East Queensland, the quantum amount is 'typically' in the order of $15,000 per allotment. Whilst this amount is generally in alignment with the expectations of some commentators, by no means does this figure on its own give a real sense of its profundity or reveal the true nature and extent of potential impact. This is because even slight changes to key underlying holding cost component variables have a severe and disproportionate effect.

At the extreme end, the level of prevailing interest rates and/or development timeframes (including regulatory assessment timeframes) is

TABLE 3 - CASE STUDY COMPARISONS AGAINST THE BASE CASE SCENARIO (SUMMARY DATA)

BASE CASE SCENARIO - CASE STUDY COMPARISONS: SUMMARY DATA	BASE CASE MODEL SCENARIO	CASE STUDY A	CASE STUDY B	CASE STUDY C	CASE STUDY D
Detail	Per Lot	Per Lot	Per Lot	Per Lot	Per Lot
Acquisition cost (undeveloped land)	$38,663	$49,771	$107,941	$50,627	$5,225
Rates, infrastructure levies/charges, DA, consultants, special council charges and land tax	$7,733	$26,687	$34,529	$23,585	$1,400
Development costs, including major civil works, building and construction	$75,000	$167,048	$227,824	$68,887	$55,000
Developer's margin	$27,287	$72,122	$112,906	$11,516	$16,658
Selling costs	$6,279	$1,649	$5,161	$1,760	$2,332
Holding costs	**$15,039**	**$14,072**	**$32,941**	**$21,423**	**$5,006**
Gross realisation (total price of allotment)	$170,000	$331,349	$521,303	$177,798	$85,621
Number of lots in subdivision	200	83	17	142	20
Total project time - acquisition to final settlement (years)	3.0	2.8	3.1	4.8	2.3
Development time from acquisition (months)	30.00	28.00	34.00	52.00	28.00
Developer's margin	20%	28%	28%	7%	25%
Cost of mortgage repayment equivalent due to holding costs as a % of mean household income*	3.58%	3.19%	7.70%	5.85%	1.56%
Polynomial (curvilinear) trend line equation	y = 7E-05x2 + 0.0027x + 0.0027	y = 5E-05x2 + 0.0026x + 0.0044	y = 1E-04x2 + 0.0061x - 0.0102	y = 9E-05x2 + 0.0012x - 0.0064	y = 2E-05x2 + 0.0019x - 0.0029

* Mean equivalised household income utilised is calculated as at date of first settlement

critical. Lot density and undeveloped land costs are also significant. At the moderate to minor end are development costs and infrastructure charges. These sensitivities are borne out by field investigations which also demonstrate that the quantum amount of holding costs can readily double. As a consequence, the impact on the housing affordability equation is such that end-users can be easily pushed into mortgage stress if they ultimately absorb holding cost variations.

Particular combinations of varying holding cost elements demonstrate the potential for even greater levels of volatility. In fact, increases in holding costs overall accelerate at a faster rate over time than other components that aggregate to constitute the final sale value of the end product. It may be readily anticipated that the combined effects of holding cost components can be extreme and drastically affect housing affordability.

The importance of this research potentially emphasises a number of aspects, such as the impact of land banking behaviour by developers (the kind of which has been outlined by various researchers such as Rowley & Costello, 2010; Tse, 1998; and Walker et al., 2008), and the significance of the timely processing of development applications and other relevant statutory documents by regulatory authorities.

This latter aspect has been a major consideration in establishing legislation and statutory authorities in many Australian states – in the case of Queensland, notably the Affordable Housing Strategy, and establishment of the Urban Land Development Authority. It was through the Queensland Housing Affordability Strategy that the Queensland government established the Urban Land Development Authority. According to the Queensland Housing Affordability Strategy, 2007, it undertook certain other changes to speed up the planning and development assessment process as a primary means to significantly reduce timelines and the associated holding costs of bringing new housing to the market.

Therefore, the rigorous determination of holding cost variables on housing affordability provides continuing evidence supporting changes to the public policy framework that promotes, retains or maximises the opportunities for affordable housing. ■

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