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Constraints to Cost Effective Land Supply

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Abstract

The ready availability of suitably zoned and serviced land is one of the key factors in the timely and cost effective provision of new land for development. Unfortunately, in many high population growth areas, land that may be available does not have ready access to infrastructure, or the appropriate designation/s (zoning) in place. The corresponding lag in supply frequently bears the blame for the resultant disequilibrium in the market and affordability pressures on the end product.

Government has the capacity to respond to the issue of land supply in a number of ways. Proactive measures define longer term goals and set the ground rules moving forwards. Reactive policy decisions are made in an often hostile environment where stakeholder interests conflict. With a trend to increased regulation, government risks further constraining the viability of land development in high growth areas, without full consideration of all the supply side variables.

This preliminary paper will identify a number of the variables which may be constraining the supply of land for residential development in South East Queensland given the current regulatory environment. It will examine the interrelationship between these supply side constraints, a full understanding of which is required by government in order for its policies to stimulate, rather than restrict the supply of land in this high growth region.

Key Words

Land supply, residential property, property development, infrastructure charges, affordability.

Introduction

A market is said to be efficient when supply and demand are in equilibrium. In the land supply scenario, there are many variables that impact both sides of the equation that frequently lead to imperfect markets. The purpose of this paper is to examine key supply side variables and their associated impact on cost effective land supply in South East Queensland. The focus will be on discussing the impact of these key supply variables other than planning or land release policies.

On the demand side of the equation, South East Queensland ("SEQ") has been the subject of significant population growth over recent years, with growth averaging 2.6% per annum between 2002 and 2008 (PIFU, 2009). This compares with the national average over the corresponding period of just 1.29% (ABS 2008). In real numbers, this equates to an average influx to SEQ of approximately 70,000 new residents per annum, or at 2.6 persons per household (PIFU, 2009), demand in the order of some 27,000 new households each year.

Many commentators bemoan the chronic undersupply of housing in SEQ, citing poor planning policy as the key cause. Research commissioned by the Residential Development Council in 2006 indicated that SEQ was then forecast to have a deficit of 10,484 lots by 2016 due to new land release constraints. This research however, pre-dated the global financial crisis, and more recent figures released by PIFU and ABS indicate new housing approvals to have dropped 16% in 2008 and new housing starts a further 24% in 2009, despite the persistent population growth of 2.4% in the same period.

Note, the aim of this paper is not to specifically address housing affordability. Rather, its intent is to explore the extent to which the supply side variables constrain land supply. In doing so, there are times that the terms "land" and "house" are used somewhat interchangeably. It is certainly acknowledged that this is unusual, however for the purposes of this discussion and in using familiar statistics and industry recognised terminology, this poetic licence is used to collectively describe the provision of residential dwellings, without discussing the actual construction of the home. Hence it is assumed that "land supply" is a prerequisite for new dwelling construction.

This paper has been structured as follows. Section 1 proposes a land supply equation, the premise of which will form the basis of the ensuing discussion. Section 2 introduces the concept of market efficiency and equilibrium price. Section 3 identifies the key cost variables from the supply side perspective and discusses their interrelationship and the constraining impact these variables impose. Section 4 presents key findings and the conclusion is presented in Section 5.

1. A Land Supply Equation

To demonstrate the impact of supply side cost variables on land supply, one must first understand the way in which each component contributes, and thus has the potential to constrain the supply chain.

In its simplest form, a formula for representing the efficient development of land, where supply meets, but does not exceed demand, can be represented as:

$$(Lc + Dc_{1-n}) \times (1 + Di) \quad = \quad GR$$

Where:

Lc	=	Land Cost
Dc_{1-n}	=	Development Costs
D*i*	=	Development Margin
GR	=	Gross Realisation

The left hand side of the equation comprises the Supply side *cost* variables, and the right hand side of the equation comprising the Demand side *value* variables.

Land Cost as a term is self evident and is the price at which the land transacts between the original englobo land owner and the developer. This cost is determined by market forces, which are frequently imperfect, as discussed further in Section 3.

Development Costs encompasses all of those costs that must be expended by the developer in transforming the englobo land parcel into finished lots. These costs are numerous and include: survey fees, clearing, filling, road construction, drainage, kerbing and channeling, rates and land tax during the period the land is held, legal expenses, selling costs, agents commission, marketing, administrative costs, interest on borrowed funds (Rost and Collins 1990) as well as project management fees, other infrastructure charges, insurance, landscaping, security, bank charges, contingency and any other cost expended in the production of the land. The time value of money is crudely captured in this cost item by virtue of the interest on borrowed funds.

Development Margin is also known as the profit and risk factor, required profit margin, hurdle rate or any number of names given to it by the individual developer/analyst. Essentially it is the return on capital invested that the developer is seeking to receive from this business venture. It is a key decision making benchmark. In theory, it is a reflection of the perceived risk involved in the business of carrying out the land development.

The Gross Realisation is simply the aggregate sum of all the allotments sold (Rost and Collins 1990). It incorporates all the factors of demand that culminate in the sale of the lot of land (or multiples thereof).

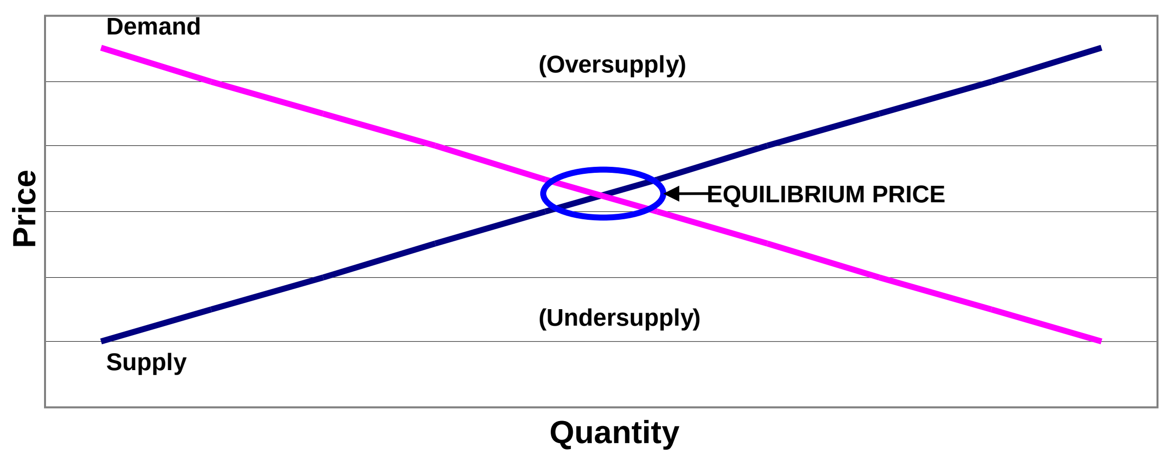
Of course this equation is an over simplification of the very complex set of activities that comprise a successful and profitable land development. However, this formula is an effective tool to demonstrate the importance of the supply side variables when considering the efficient supply of land to the market. Each of the variables identified above are comprised of complex sub-variables, which will be expanded upon in subsequent sections, and be the subject of future research.

2. Market Equilibrium and Equilibrium Price

Any introductory economic text will describe an efficient market as being based on a market with buyers and sellers each having perfect market knowledge, with equilibrium occurring at the price at which the quantity demanded equals the quantity supplied, with both supply and demand being determined by market forces alone (Evans 2004, Baumol et al 1988, Sloman and Norris 2005). Sloman and Norris (2005) define the equilibrium price as being "the price where the quantity demanded equals the quantity supplied: the price where there is no shortage or surplus."

This market equilibrium concept and associated equilibrium price can be illustrated using traditional demand and supply curves, with equilibrium being achieved where the two curves intersect as demonstrated in Figure 1.

Figure 1: Equilibrium Price of Land Supply



Source: Adapted from Sloman and Norris 2005

Applying this theory to the housing market, if market forces alone determined supply and demand then the equilibrium price would be the point at which the quantity demanded equaled the quantity supplied. Housing demand factors that contribute to this equilibrium price are driven by a number of variables including: interest rates, employment, population growth (Residential Development Council 2007) as well as other factors such as consumer sentiment, bank credit policies and stimulating government policies such as the First Home Owners Grant.

Therefore, the demand side of the equilibrium equation can be said to be impacted predominantly by macro factors such as interest rates, employment, population growth etc. That being the case, it can be argued that the key drivers of demand, and therefore the price the market is willing and able to pay, is determined by factors largely external to the property market and that the property market merely responds to those demands. These macro factors set the equilibrium price, or price ceiling, or "affordability" level that the market is willing, or able to pay for its housing needs. Note, increases in the First Home Owners Grant would be considered a non-market force, as would changes to bank credit policies that impact the borrowing capacity of customers.

Whipple (1995) and Evans (2004) acknowledge the correlation of economic theory supply and demand principles to the land and property markets, concluding that certain inefficiencies exist. Evans (2004) proposes a 90% efficiency rating based principally on the heterogeneity of properties and the relative infrequency of transactions.

The purpose of this paper is not to discuss the relative efficiency rating of land demand and supply, rather to acknowledge the theory behind market efficiency, being balanced demand and supply, and to embrace the concept of an equilibrium price, where "affordability" is achieved.

Malpezzi and Wachter (2005) discuss in some length the impact of elasticity of supply (or lack thereof) on price. Each of the constraints discussed herein negatively impacts the elasticity of supply and thereby contributes to perpetuation of disequilibrium in the market.

3. Supply Side Variables and Their Constraining Effects

The concept of equilibrium price has been introduced and the determinants of the demand curve identified. For completed residential stock, this price point is a market "value" figure, determined independent of the "cost" to provide it. ie the market will not reimburse a developer the cost to develop the house/land if that cost is in excess of the market (equilibrium) level. It therefore follows that for the market to achieve equilibrium, the supply side cost variables need to fluctuate in direct inverse correlation to each other to ensure that the supply side variables do not increase in excess of the demand side price point acceptable to the market. That is, if one cost goes up, another must come down to maintain supply side cost balance. This remainder of section discusses each of the supply side inputs in the SEQ context.

For the purposes of this discussion, the supply side variables will be discussed in reverse order to that presented in the proposed Land Supply Equation: Development Margin, Development Costs and Land Cost.

Development Margin

The Development Margin, profit and risk factor or hurdle rate is an important input in the supply side cost equation, the impact of which appears to be poorly understood by public sector land supply analysts.

Rost and Collins (1990) explain that the development margin is comprised of two parts, with one part being a profit component or return on capital invested, and the other part being a risk factor relating to the security of the funds invested, or a form of "insurance against errors" in cost, timing and revenue estimates. Whilst being an interesting delineation, these two components are essentially indistinguishable from each other and generally fall under the one decision making criteria.

As with other businesses, this profitability measure is generally described as a percentage of total capital employed. This factor is often omitted in public sector land supply analysis.

However the inability of a project to meet this benchmark is arguably the greatest constraint to land supply as developers elect to invest their limited capital elsewhere to achieve their desired return.

Only when supply and demand reach equilibrium, will the developer's return equal the forecast benchmark, D*i*. If the developer's forecast profit is eroded by the growth of other costs, and is not offset by a corresponding growth in market prices, supply will be constrained by virtue of one or both of the following impacts.

Firstly, the developer may choose not to proceed with a project that does not meet its profitability hurdle rates. Many land development companies have set investment criteria that protect the interests of their shareholders. Projects that do not meet set hurdle rates do not receive management approval to proceed. This approval is most commonly withheld at the acquisition phase where an inflated land price is attempted to be counterbalanced by the acceptance of marginal profitability. The question then begs to be asked, what is an appropriate development margin to apply? Rost and Collins (1990) warns that "because of the specialist nature of this field of investment, conventional tests and comparisons with other forms of investment could be misleading." Despite this warning, comparisons can be drawn from industry and other investment sources in order to establish an appropriate profitability range to apply. Data is difficult to source on land development profitability due to two key factors: no publicly available information on private company profits, and public companies partaking in land development are now predominantly part of "integrated property companies", whose published profitability statements often combine all investment activities into a single return figure, effectively smoothing the variances in return from the risky development activities, with the lesser, but more stable returns of their property investment activities ie. Office buildings and shopping centres etc.

One potential source of publicly available data is that of any listed development fund operating in the residential land sector. However, it can be argued that much of the profitability of these projects is "pre-paid" to the developer in management fees during the course of the project, and that the headline profits paid to investors, is the residual "super profit" remaining after all other risk takers have been paid their return.

In the absence of directly correlating data, and in an attempt to establish a verifiable profitability range, a discussion of company profits in various sectors may prove useful.

An international comparison of company profitability was carried out by Walton in 2000 indicating a 10 year average profitability of all non-financial companies in world's leading economies throughout the 1990's. This study indicated a profitability range from 3.2% in Germany, to 15% in Singapore. Australia was not included in the index due to changes in reporting requirements at the time, however other industrialised countries from which comparisons may be drawn included the UK at 11.5%, Japan at 9.2% and US at 8.3%. Note these are averages across a wide range of industry sectors over a ten year period.

More recent research by Dorfman (2009) into high profit companies in the US revealed a 55% profit margin by the US's third largest offshore oil driller Noble Corp, 27% achieved by McDonalds fast food chain and Terra Industries a nitrogen fertilizer manufacturer, and 40% and 28% returns by Philip Morris and Reynolds American respectively in the tobacco industry.

Returning to property sector comparisons, Whipple (1995, 2006) uses 20% in residual method example calculations, as does the industry standard software "EstateMaster" in its development feasibility base models.

In the near-20 year experience of this author, it is not uncommon in the industry for D_i to be in the order of 20% - 25%. In SEQ, this range would apply to land within the Urban Footprint, with an "average" risk profile. Development margins either side of this range may be applicable under certain circumstances if the perceived project risk is above or below average, or if the risk acceptance/appetite of the developer/investor varies similarly. Further research on this topic is required to establish a body of evidence to support this suggested average rate range.

The second impact of diminished hurdle rates is perhaps the most critical impact at present, that being of inability to secure project finance. The forecast Development Margin provides a "buffer" for banks in their assessment of the capital risk involved. Since the onset of the global financial crisis, credit markets have virtually closed to property development in SEQ, with only the most profitable and risk mitigated projects able to obtain any level of financing (McCasker 2009). The inability of projects to obtain development finance is expected to severely limit new supply in the foreseeable future, the constraining impact of which can not be understated. This impact goes further than the simple cost of debt finance, which in an increasing interest rate environment is not insignificant. The low loan to value ratios on offer by the few remaining banks willing to lend to developers, stymies development as the residual equity requirement is not able to be funded. Severe asset write downs have eroded equity and risk averse investors are able to invest elsewhere.

Hence the *availability* of finance is also a key consideration on the supply side of the equation. Quantification of this variable, and the associated impact, will be the subject of further research.

Development Costs

As indicated previously, the term Development Costs encompasses all the costs associated with transforming the land from an englobo parcel to an urban lot ready for construction of the dwelling. These costs include: acquisition costs, council charges for infrastructure provision etc, civil works and associated "hard" costs, marketing, holding costs, professional fees, interest costs etc.

The majority of these costs are set by market forces, have relative low volatility and hence can be forecast with relative accuracy by the developer at the acquisition phase (where the Land Cost becomes fixed). Leaving aside interest costs (and the availability of finance) as a separate discussion item outside the scope of this paper, the key unknown with the highest volatility in the development cost inputs in SEQ is that of infrastructure charges and holding costs during the elongated approval period.

Garner (2010) discusses fully the impact of holding costs over extended approval periods such as that which are experienced in SEQ.

Policy changes that came into effect with the SEQ Regional Plan in 2005 created the framework for councils to increasingly seek to recoup the costs of new urban infrastructure through the impost of “infrastructure charges” at the development approval phase.

The recent increased focus on infrastructure cost recovery by State governments and local councils has the borne the brunt of public criticism in the land supply debate, and perhaps rightly so. The Residential Development Council (2007) claims that government taxes, charges and compliance costs make up 25% - 33% of the cost of new housing nationally.

Where much has been written on the constraining influences on land release policies (see Moran 2008), only more recently has the correlation been made between cost imposts, particularly of infrastructure charges and land supply. Even the Reserve Bank of Australia has recently made the correlation between the supply price of new housing in Australia and the extent of charges state and local governments impose to cover the costs of providing infrastructure to new greenfield developments (Lenaghan and Carapiet 2009).

To argue a solution to the affordability issue, based only on the availability of land for housing is unsophisticated at best. It is naïve to the complexities of the supply chain as discussed herein. It could be argued that in SEQ with the Regional Plan identifying 42 greenfield areas which are either committed or potentially available for development, then the land availability issue has been resolved. But as discussed earlier, supply is still diminishing, despite increasing demand. The key policy constraint in SEQ is therefore not land availability, but the disequilibrium in the market caused primarily by the high cost imposts applied.

Land Cost

Discussion on the Land Cost component has been left last, as it this component that frequently is the most elastic of the three key supply side cost variables. That is, what the developer can afford to pay for the land will fluctuate in accordance with the forecast development costs and the required development margin.

Indeed, this premise is the basis for the commonly used valuation methodology known as hypothetical development, reverse feasibility or static model, used to determine the value of an englobo parcel of land suitable for development. Under this methodology, the Gross Realisation (or equilibrium price in this scenario) as determined by the valuer is the starting point from which all foreseeable development costs and an allowance for profit and risk, are deducted to arrive at a land value (Whipple, 1995, 2006; Rost and Collins 1990).

This "reverse" methodology is suitable for determining the Land Cost assuming all costs of development are known or able to be accurately forecast at the outset. This is rarely the case. Land development generally starts with the purchase of the englobo land parcel, with this price becoming a fixed input to the supply chain. Development costs are then confirmed through the design and approval process. Development proceeds, lots settled, and the gap between costs and revenues is the developer's return D*i*.

Speculation is common in land development. Using the SEQ example, land may be purchased outside of the Urban Footprint in the expectation of its inclusion in the next five yearly update. Lobbying of government and council may be undertaken in the interim in an effort to sure up one's position. The same applies to medium and high density development areas that may be seeking to fall within preferred Transit Oriented Development locations or within Activity Centres for example. The premise being that land value uplift will occur when the potential yield of the land increases i.e. from rural to future urban etc, or other amenity improved such as improved infrastructure.

However, where the developer is required to pay for new infrastructure, the amount it can afford to pay for the land decreases accordingly. Hence speculator's and other land owner's high expectation of increased land value can not be realised and transactions do not occur where the vendor can afford to hold the land until its target value can be achieved.

The Urban Land Development Authority ("ULDA") has recognised this theoretical land value uplift as a potential source of funding for infrastructure costs. The ULDA considers it inappropriate for government to fund infrastructure that results in a windfall gain to land owners by virtue of a site being declared an Urban Development Area ("UDA") and become capable of increased development yield. The ULDA proposes that land value uplift be pre-determined and equate to a rate per square metre of additional gross floor area in excess of previous development yields. A 50:50 sharing in this land value uplift is proposed. These contributions by the land owner will be used by the ULDA to fund major infrastructure works, affordable housing and ecologically sustainable outcomes of the UDA. Other infrastructure will be funded via developer contributions in the normal manner.

Under this model, landowners who do not wish to access the additional GFA delivered by the UDA, are not subject to this charge.

The ULDA's Infrastructure Contributions Framework (November 2008) provides the following example. Note Bowen Hills is an inner city suburb which is ripe for urban renewal:

Example: Major Infrastructure and Affordable Housing Contribution

In the Bowen Hills Heart, the Brisbane City Council City Plan indicates a maximum plot ration of 1.75 whereas under the proposed ULDA Development Scheme, this plot ratio is up to 8.0.

The increase in land value for this area is approximately $440/sqm GFA for the Bowen Hills area, a 50/50 sharing would see $220/sqm GFA going towards the Major Infrastructure and Affordable Housing Contribution and the remainder providing an incentive for the landowner to redevelop. Initial estimates of the major infrastructure works required to be undertaken by the ULDA in Bowen Hills are in excess of $75m.

Source: ULDA Infrastructure Contributions Framework, November 2008

The success or otherwise of this impact on land value will be determined over time, with the Bowen Hills UDA Development Scheme only being approved in July 2009.

One negative impact of this land value uplift sharing concept, is that it not only “penalises” and deters speculators, it also diminishes the value of long term land holders, sometimes whose only superannuation investment has been in its land assets. This occurs particularly to farmers (for englobo land) and any other business operator (eg. in fill sites), who seek to take advantage of the higher and better use value of the land upon which they have been operating their business.

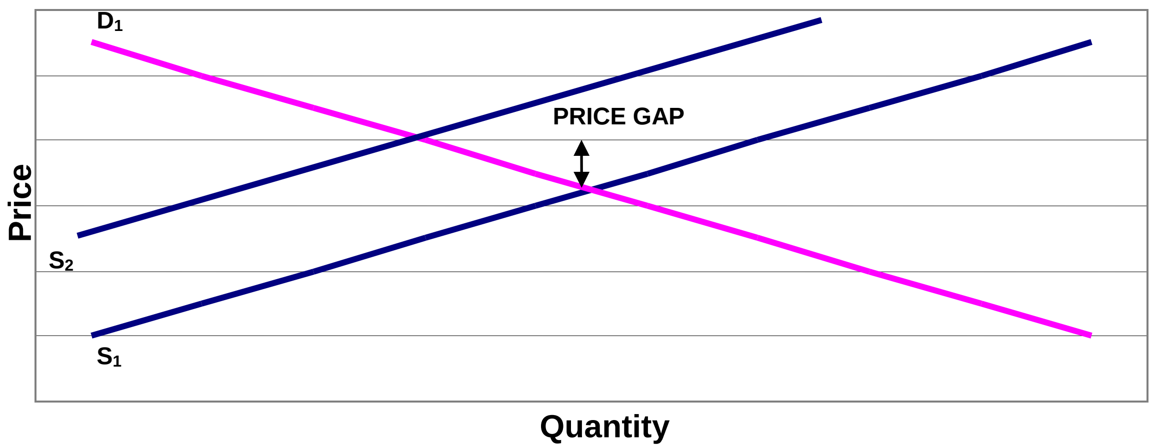
The constraining impact of this is that the vendor becomes less motivated to sell for the subsequent lesser price and supply of housing is again stymied through unavailability of land for development.

Land Cost is also impacted by imperfect market forces including: unrealistic vendor expectations, un-motivated vendors, imperfect market knowledge, ill-defined infrastructure costs etc. All contributing to constraining the cosst effective supply of housing.

4. Findings

The population of SEQ continues to grow in excess of new housing supply. This is despite plentiful land being available together with a supportive policy framework by virtue of the SEQ Regional Plan. What is currently constraining development in SEQ are the supply side cost variables of Land Cost, Development Cost and Development Margin. Increases in these costs have created a “price gap”, whereby the sum of the costs to develop land is in excess of the price the market is willing, or able to pay. This is illustrated in Figure 2 below, with S_1 representing the supply cost structure necessary to produce land in line with average market “affordability”, and S_2 being the cost of land supply in a constrained market as described herein.

Figure 2: Changes to Cost of Land Supply



In an efficient market where product is able to be supplied at a cost the market is willing and able to pay, these supply side costs have a direct inverse relationship. That is, if one cost goes up, another cost must go down for the end sales prices to remain the same (equilibrium price).

If the demand side of the equilibrium equation is impacted predominantly by factors such as interest rates, employment, population growth, it can be argued that the key drivers of demand, and therefore the price the market is willing and able to pay, is determined by factors largely external to the property market and that the property market merely responds to those demands. These macro factors set the equilibrium price, or price ceiling, or “affordability” level that the market is willing or able to pay for its housing needs. This price point is a market “value” figure, determined independent of the “cost” to provide it. ie the market will not reimburse a developer the cost to develop the house/land if that cost is in excess of the market (equilibrium) level.

It therefore follows that for the market to achieve equilibrium, the supply side variables of Land Cost and Development Costs need to fluctuate in direct inverse correlation to each other to ensure that the supply side cost inputs do not increase in excess of the demand side price point acceptable to the market. That is, if one cost goes up, another must come down to maintain supply side cost balance.

This cost conundrum is recognised by the ULDA. It acknowledges that (re)development will not occur if:

i) infrastructure charges are so high that the impact to land values provides no incentive for land owners to sell for redevelopment; and

ii) uncertainty in relation to yield, approval times and infrastructure costs results in developers being unable to price the risk in accordance with commercial hurdle rates.

Hence it is the unwillingness of vendors to accept lower land values, combined with the inability of government to fund urban infrastructure other than through development levies are the key constraints to cost effective land supply in SEQ currently. The inability to obtain finance further compounds this problem.

5. Conclusion

This paper has presented the argument that for an efficient land supply market to exist, for supply to keep pace with but not exceed demand, then the sum of the supply side inputs must be equal to the equilibrium or market price.

Through examination of primary economic principles and the fundamentals of land development, this paper has identified a number of key supply side variables that constrain market efficiency. These key variables include: vendor expectation of land value, recovery of infrastructure cost policies, profitability expectations of developers and the availability of development finance.

It has been concluded that for an efficient market to exist, for supply to keep pace with but not exceed demand, then the sum of the supply side cost inputs must be equal to the equilibrium or market price. For supply to meet demand and the market to potentially reach an equilibrium range, the supply side variables can not be examined in isolation and that the issue is more complex than a pure land release policy approach. A thorough understanding of how each of the costs impacts the other, and potentially constrains supply is required by policy makers to ensure that supply can reach the market as and when required, at a price point that is acceptable to the market.

It will be the subject of future research by this author to examine alternatives for how the costs associated with supply side of the land supply equation can be managed most equitably to ensure cost effective land is delivered in accordance with demand.

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