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Sourcing funding for the provision of new urban infrastructure has been a policy dilemma for governments around the world for decades. This is particularly relevant in high growth areas where new services are required to support swelling populations. Existing communities resist the introduction of new taxes to fund such infrastructure, hence the introduction of charges to the developer has flourished.

The Australian infrastructure funding policy dilemmas are reflective of similar matters to some extent in the United Kingdom, and to a greater extent the United States of America. In these countries, infrastructure cost recovery policies have been in place since the 1940's and 1970's respectively. There is an extensive body of theoretical and empirical literature that discusses the passing on (to home buyers) or passing back (to the englobed land seller) of these increased infrastructure charges, and the corresponding impact on housing cost and supply. The purpose of this research is to examine the international evidence that suggests infrastructure charges contribute to increased house prices as well as reduced land supply.

The paper concludes that whilst the theoretical work is largely consistent, the empirical research to date is inconclusive and further research is required into these impacts in Australia.

The Impact of Infrastructure Charges on New Housing Cost: An International Comparison

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Abstract: Sourcing funding for the provision of new urban infrastructure has been a policy dilemma for governments around the world for decades. This is particularly relevant in high growth areas where new services are required to support swelling populations. Existing communities resist the introduction of new taxes to fund such infrastructure, hence the introduction of charges to the developer has flourished.

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The paper concludes that whilst the theoretical work is largely consistent, the empirical research to date is inconclusive and further research is required into these impacts in Australia.

Keywords: Infrastructure charges, housing, affordability, supply.

1. INTRODUCTION

Sourcing appropriate funding for the provision of new urban infrastructure has been a policy dilemma for governments around the world for decades. This is particularly relevant in high growth areas where new services are required to support swelling populations. These new services generally include basic services such as local roads and water supply, but can also apply to broader community services such as off-site road and water facilities, schools, libraries and police stations etc. Existing communities resist the introduction of new taxes to subsidise newcomers into their communities, hence the introduction of infrastructure charges paid by the developer has flourished.

The Australian infrastructure funding policy dilemmas are reflective of similar matters to some extent in the United Kingdom ("UK"), and to a greater extent the United States of America ("US") and Canada. In these countries, infrastructure cost recovery policies have been in place since the 1940's and 1970's respectively. There is an extensive body of both theoretical and empirical literature from a number of countries that discusses the passing on (to home buyers) or passing back (to the englobo land seller) of these increased infrastructure charges. Regardless of the direction of passing and the various market elasticity's, in the long term the outcome appears inevitable that house prices rise as a result of the infrastructure charges. The question that remains in debate is: by how much?

In a climate where housing affordability is a policy objective for many governments, a clear understanding of the impacts of these government charges on the affordability of new housing is imperative,

The purpose of this paper is to provide an up to date overview of international literature on this topic, examining both the

theoretical and empirical evidence that suggests infrastructure charges contribute to increased house prices either directly through the passing on of the associated costs, or indirectly via reducing land supply, which in a market with at least constant demand, will also lead to increased house prices.

This review will form the basis for future research which will seek to quantify these price impacts on the housing market in Queensland, Australia.

1.1. What are Infrastructure Charges?

The term "Infrastructure Charges" is a term that is used to encompass the estimated proportionate cost of providing trunk and other off site urban infrastructure such as local roads, stormwater and community facilities/parks to new development. It is a one off charge levied on the developer, generally at the time of rezoning/approval (2004, Campbell, 2004, Burge, 2008, Been, 2005, Mathur et al., 2004)

Around the globe, other terminology is used to describe what are essentially similar urban infrastructure funding mechanisms. For example, the term "Impact Fees" is used throughout the majority of the US, "Development Charges" is prominent in Canada, "Planning obligation", "planning gain" or "Section 106 agreements" are all terms used today to describe the equivalent to an infrastructure charging system in the UK (Evans, 2004a). "Exactions" is a general term used in Indian and some American literature, whilst in Australia "Infrastructure Charges" or "Developer Contributions" are largely interchangeable terms depending on the jurisdiction.

For clarity, this paper uses the term *infrastructure charges* when referring to the one off fees chargeable by a local authority for the provision of urban infrastructure required to support new residential development. Similarly, *rates* is used to describe regular local jurisdictional levies on existing home owners for the purposes of infrastructure repairs, maintenance and renewal, amongst other things. Whilst not directly interchangeable, for the purposes of this paper this term is used in lieu of terms such as "property taxes" (US).

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Given the topic of this research is based on house price impacts, the scope of this review is limited to residential development only.

This paper is arranged as follows: Section 1 has provided the introductory framework for the topic. Section 2 details the methodology applied in the preparation of this paper. Section 3 outlines the theoretical research on this topic, with the empirical material covered in Section 4. Section 5 discusses the phenomenon of “overshifting” in the context of the prior findings. Section 6 then concludes.

2. METHODOLOGY

A literature search identified a number of international studies into the impacts of infrastructure charges on new housing prices and on land supply.

A very large number of academic, government and industry papers on the impact of infrastructure charges on new housing prices and/or land supply were identified. A rich body of academic literature from North America was identified with a 2005 literature review referencing over 100 separate works from Canada and the US directly relating to this topic dating from the early 1970's. This extensive body of work is reflective of the maturity of the infrastructure charging regime in North America which has been in existence for over three decades.

In the UK, an extensive amount of literature in the form of scholarly articles, government commissioned reports, and even multiple text books on the topic are available on wider structural planning issues affecting its housing market. As broader structural planning issues are outside the scope of this research, this literature review has focused primarily on the direct issues relating to the financing of growth related urban infrastructure and the passing on or passing back price effects examined.

The Australian academic literature was surprisingly sparse. One paper on the house price impacts of infrastructure charges was identified. However, government and industry documents discussing infrastructure charges were in plentiful supply with numerous publications dating up to present day, reflecting the contemporary and evolving nature of infrastructure charging policy in this country.

All literature used in this review were sourced via online database key word searches. Other related works were sourced through the citations in primary research papers identified.

3. THEORETICAL EVIDENCE

Academics have been theorising on the impact of infrastructure charges on new housing costs from as early as the 1970's. Many academics have used urban economics supply curves to argue the phenomenon, some have presented mathematical proofs in evidence whilst others argue through scenario analysis based on different market conditions (elasticities).

The premise for any price impact argument is based on the concept of who actually bears the burden of the infrastructure charge?

Infrastructure charges were originally intended to transfer the burden of infrastructure provision in high growth areas from the public purse and existing owners on to developers (Evans-Cowley, 2003). However, the literature indicates there are a number of parties that may be potentially liable for the ultimate payment of these fees. Apart from the developer, these include: the original landowner, the new homeowner (Huffman et al., 1988), or the existing community (Singell and Lillydahl, 1990, Brueckner, 1997) or even other parties such as the providers of capital (Ellickson and Been, 2005). There has been much debate over the past three decades on the on passing, back passing, shifting, back shifting (Huffman et al., 1988), overshifting (Ihlanfeldt and Shaughnessy,

2004), capitalisation, backward capitalization (Burge, 2008) etcetera of these fees between the various parties to new development. The following paragraphs discuss some of the more pertinent international literature on the home price impacts of infrastructure charges.

3.1. The Developer

Consider first the original intended payer of these costs, the developer. Upon introduction of infrastructure charges, developers are faced with the dilemma of either increasing sales prices to recoup the additional costs (pass on), absorb the fees by way of lower profit margins, or pay the land owners less for the englobed land in the first place (pass back) (Huffman et al., 1988, EVANS-COWLEY et al., 2005).

This premise is examined widely in the North American literature. Huffman et al (1988) also argue that developers do not absorb the costs by way of lower profit margins as in a competitive market profits are already at levels of return consistent with the opportunity cost. Yinger (1998) confirms the pass on or pass back effect stating that “to the extent housing construction is competitive, development fees do not place any burden on developers” (Yinger, 1998, p 37)). Evans-Cowley and Lawhon (2003) also note that developers do not absorb these costs by way of lower profits, as the market (through the land acquisition process) has already set the cost structure at which development is encouraged. Research also confirms the premise that developers are likely to make investment decisions based on profitability and if that profitability is reduced in one area, it will move its operations to another to maximize profits (Evans-Cowley, 2003, Mathur et al., 2004, Burge, 2008). In Australia, Watkins (1999) offers the only perverse theory, claiming via mathematical proofs that exactly half of any charge is absorbed by the developer by way of reduced profits, with the other half either passed on or back. Been notes that “Watkins did not provide an intuitive explanation for that surprising result, and his argument has been largely ignored in the literature.” (Been, 2005, p 174).

Hence the literature indicates that developers are in fact the least likely party to carry this cost burden. The exception to this if the actual infrastructure charges imposed are greater than anticipated by the developer at the time of acquisition and market inelasticities prevent full passing on. However, even in this instance, the developer will still seek to recoup the difference between the anticipated and actual charge by redesigning the project to obtain the desired profit margins (Huffman et al., 1988).

In conclusion, “the assumption is that the developers will bear none of the fee because if their profit margins were high enough to absorb the fee, competition already would have either reduced the price of housing to the consumer or increased the prices paid to the landowner” (Been, 2005, p153).

3.2. The Landowner

Consider next the original landowner who sells his/her englobed land to the developer. When the infrastructure charge is anticipated, and the developer cannot pass those additional costs on to home buyers due to market conditions, the developer will seek to pay less for the undeveloped land.

In the US, Huffman et al (1988) argue that this “back shifting” is unlikely in many instances because land owners have a reservation price, below which they will not sell. Evans (Evans, 2004b) confirms this phenomenon in the UK citing the introduction of a 100% betterment levy in 1947 resulted in a freeze of the land market, as there was no incentive for land owners to sell, and was repealed only three years later. Subsequent attempts in the UK had

similar supply constraining impacts and were abolished in 1985 (Evans, 2004b).

Whilst it is outside the scope of this brief paper to discuss the various mechanisms for recoupment of the cost of providing urban infrastructure, the concept of a “betterment tax” does have a place in this discussion as it relates to the passing back of infrastructure costs to the land owner and supports the argument for a consequent reduction in supply.

The UK has a long history dating back to the 1940’s of taxing land owners for any “betterment” as a result of increases in value subsequent to the provision of infrastructure or later, from receiving favourable planning approvals. It was thought unfair that the owners of land should be the beneficiaries of increased capital value purely through economic and/or population growth or the provision of public infrastructure (Evans, 2004b). Hence, where this value uplift was due to infrastructure expenditure, this betterment levy was essentially a full passing back of the benefit of the infrastructure.

Whilst the pass back effect will stall sales in the short term, Ihlanfeldt and Shaughnessey (2004) argue that over the longer term back shifting can be possible. They claim this can be due to either “general inflationary price increases” resulting in the reservation price being achievable, and/or weaker market conditions resulting in lowering of vendor expectations. Whilst the latter does represent true back passing in weak market conditions, surely the former scenario is evidence of forward passing and supports the theory of increased house prices due to reduced supply (as a direct response to infrastructure charges) assuming at least constant demand, rather than “inflationary pressures”.

It is interesting to note that, it is a recommendation of the Barker Review of Housing Supply (2004) that the UK government again pursue means to share in windfall profits (ie betterment) that arise as a result of planning approval, claiming that: “this Planning-gain Supplement would fall largely on landowners, with little impact on house prices.” (Barker, 2004). This is a clear acknowledgement that the alternative system of developer paid infrastructure charges are passed on to home buyers.

In summary, to the extent that homeowners’ willingness to pay is less than the infrastructure charge itself, the difference would shift backwards to the vendor of the englobo land since developers are mobile and bear no burden in the long run (Yinger, 1998). However, the literature indicates that passing back does not generally occur as land owners have no compulsion to sell if not for profit (Evans, 2004b) and attempts at back passing instead stymie supply.

3.3. The Home Buyer

We consider finally the passing on of the infrastructure charge to the consumer or home buyer. As discussed above, if neither the developer nor land owner is willing to bear the cost of these charges, then the burden must fall to the home buyer by way of higher house prices.

This concept is consistently captured by a vast number of academics, particularly in the US and Canada over the past three decades including (but not limited to): Ellickson (1977), Snyder, Stegman and Moreau (1986), Downing and McCaleb (1987), Huffman, Smith, Nelson and Stegman (1988), Delaney and Smith (1989), Singell and Lillydahl (1990), Skaburdis and Qadeer (1992), Altshuler and Gomez-Ibanez (1993), Dresch and Sheffrin (1997), Brueckner (1997), Skidmore and Peddle (1998), Yinger (1998), Baden and Coursey (1999), Mayer and Sommerville (2000), Nelson and Lillydahl (2002), Nelson and Moody (2003), Evans-Cowley and Lawhon (2003), Ihlanfeldt and Shaughnessey (2004), Mathur, Waddell and Blanco (2004), Campbell (2004), Been (2005), Evans-Cowley, Forgey and Rutherford (2005), Burge and Ihlanfeldt (2006) and Burge (2008).

It is difficult to select just one quote to capture such a weight of evidence and argument. Mathur et al (2004) chose earlier work by Altshuler and Gomez-Ibanez from 1993 in stating that “under tight market conditions ... we would expect the fees to be passed on principally to consumers, while developers and land-owners would absorb most of the cost of the fees in the form of lower profits under soft market conditions”. This is the overwhelming conclusion of the majority of the literature. Burge (2008) notes that most studies assume a relatively normal price elasticity of demand, which he states is reasonable given infrastructure charges are generally used in growing jurisdictions, which are characterized by a competitive housing market, further supporting the proposition of a passing on of infrastructure costs to home buyers.

With such a plethora of excellent literature on this topic, tested and developed over a number of decades, it is little wonder that in modern literature in countries such as the UK, US, India and Australia, it is a given that in a competitive market with elastic housing demand, whilst infrastructure charges in some instances may be borne by the developer and/or land owner in the short run, in the long run these costs are borne by the home owner by way of higher house prices (3iNetwork, 2009, Infrastructure Charges Taskforce (ICT), 2011).

In summary, with supporting literature dating back to the 1970’s, current international literature now largely assumes it as given that infrastructure charges increase the price of new housing in the long run.

3.4. Other Parties

Whilst it is outside the direct scope of this paper, it is appropriate to acknowledge other parties that have been reported to carry the burden of the cost of infrastructure charges as well.

US research suggests that existing home owners also share the burden by way of increased cost of existing housing (Singell and Lillydahl, 1990, Brueckner, 1997, Yinger, 1998). More recently in Australia, it has been acknowledged that if the infrastructure charge does not fully pay for the actual cost of the infrastructure, the gap is paid for by both new and existing home owners by way of increased local jurisdictional rates (Chan, 2009, Infrastructure Charges Taskforce (ICT), 2011). One US paper even purports that this burden may also fall on the providers of capital. Ellickson and Been (2005) argue that if all developers are subject to infrastructure charges, they will have a lesser propensity to proceed with projects and “as a result lenders would have to charge lower interest rates to induce them to proceed.” (Been, 2005, p 173) .

The theoretical work is therefore consistent in its conclusions that despite market conditions (that is relative market elasticities) infrastructure charges in virtually all instances are passed onto home buyers in the long run and will thus lead to increased housing prices and hence reduced housing affordability.

4. EMPIRICAL RESEARCH

If the theoretical work is largely consistent in its conclusions that infrastructure charges lead to increased housing prices, the next question that follows is: how much do house prices increase by?

This review of the literature has been unable to identify any empirical research from the UK on whether either the betterment or the planning obligation methodologies over or under passes the cost of infrastructure provision, whether that be on passed to the home buyer, or back passed to the land seller. Bramley (2005) provides anecdotal evidence only. However, there is a well established body of empirical research that has evolved from this theoretical evidence on the cost impact of impact fees on new housing in the US over the past 35+ years.

Been (2005) provides a comprehensive and chronological overview of the empirical research from 1989 to 2004. She identifies up to a dozen separate North American studies on the price impacts of infrastructure charges on new housing costs, a number of which also examine the price impact on existing housing. Separate studies are found from both Canada and the US.

Burge (2008) makes the observation that much of the early work suffers from weaknesses in methodology and lack of appropriate data. In his 2008 work, Burge identifies a further three papers that post date Been's critique. A further paper by Lawhon (2004) from research carried out in 1996 is not cited by either of these works.

Review of this literature reveals it is a danger to assume that passing, or shifting of costs is at parity (ie. \$1 extra for infrastructure charges = \$1 passed on or back). Research from the USA indicates that it is common for "over shifting" to occur, with home buyers paying a greater incremental increase in the cost of the new home (as compared to the cost of the infrastructure charge) as developers seek compensation for the additional risk taken and return on costs (Mathur et al., 2004, Ihlanfeldt and Shaughnessey, 2004, Campbell, 2004). Further, this overshifting can also be combined with back passing to land owners (Ihlanfeldt and Shaughnessey, 2004), with developers requiring higher profit margins to compensate them for the additional uncertainty associated with a rapidly changing regulatory environment.

In this short article, it is not possible to analyse each of these models. Suffice to say, that whilst the findings are consistent in quantifying a consistent "overshifting" of infrastructure charges to new (and existing) housing prices, the methodologies used vary greatly, as does the extent of overshifting identified. In these studies, a \$1 infrastructure charge is attributed to from as little as a \$0.13 for the developed lot only (EVANS-COWLEY et al., 2005), \$0.23 increase in new house price (Dresch and Sheffrin 1997) and up to \$3.58 increase in new house price (Singell and Lillydahl, 1990). If we assume that subsequent works build on prior works, let us then focus the remainder of this discussion on the several works from the past decade.

Brief details of each of the empirical works post dating 2000 are listed in Table 1 for the purpose of providing an appreciation of the range of work on this topic, as well as in the variance in approach and findings.

The research in the last decade from the US indicates that for every \$1.00 increase in infrastructure charges, new housing costs increase by \$1.50 to \$1.70 (Burge, 2008). This concept of "over shifting" for new housing is consistent across all of the research to date. What is also evident is that this price impact is passed on at varying rates depending on the characteristics of the housing, with the implication that more affordable homes bear less of this burden than arguably those who can afford to pay more (less price sensitive).

Baden and Coursey (1999) provides some insight into this over shifting phenomenon, explaining that infrastructure charges add additional uncertainties and delay costs in the approval process, resulting in developers recouping more than the cost of the fees alone. So not only are impact fees passed directly onto homeowners, there is an overshifting effect to compensate developers firstly for the additional uncertainty (risk) and secondly a return of funds invested component, either for the developer, or its financier over the development period. Ihlanfeldt and Shaughnessey (2004) and Burge and Ihlanfeldt (2006) provide a very different explanation, claiming that infrastructure charges add value to home buyers which they willingly capitalised into the home price as an upfront payment. This value may be in the form of additional amenity, or expected future savings in jurisdictional rates due to the upfront payment of the infrastructure provide by the charges. The difference in these two explanations is explored further in the following section.

Table 1: Empirical Research Models and Findings

Year/Author	Methodology	Impact*	
2004 Mathur, Waddell and Blanco	Hedonic model based on the value of new homes in 3 price categories across 38 cities and towns 1991-2000 [Washington]	Low quality Mid quality High quality	\$0.60 \$1.66 \$3.58
2004 Ihlanfeldt and Shaughnessey	Hedonic and repeat sales and regression methods (using time series data) for 39,792 new homes and 107,376 existing homes and land [Florida]	\$1.64 increase for new homes \$1.68 increase for existing homes.	
2004 Campbell	Hedonic modeling for 279,000 new and existing homes and 45,000 vacant land sales 1997 – 2001 [Orlando SMSA]	\$1.00 decrease for undeveloped land \$1.60 new homes \$1.00 existing homes	
2005 Evans- Cowley, Forgey and Rutherford	Pooled cross-sectional OLS + fixed and random effects models. 1999 data. [43 cities in Austin, fort Worth, Dallas and Houston]	Lot value increases by 1.3% for developed land (\$0.13 increase) Undeveloped land decrease of 0.042% (\$0.04 decrease)	
2006 Burge and Ihlanfeldt	House price indices + regression analysis for new and existing homes in 41 counties for small, medium and large homes (by square footage) 1993-2003	Small home Mid size Large home [Florida]	\$0.38 \$0.82 \$1.27

*Accumulative impact to house prices for each additional \$1.00 of infrastructure charges. Source: Author, Been (2005) and Burge (2008)

Evans-Cowley et al's 2005 work took an alternative approach, instead examining the pass on price effect on the developed lot. This work follows on from Skaburskis and Qadeer (1992) in Canada and Nelson et al (1992) in US who had previously examined price impacts on vacant lots (as compared to built homes). This significantly lower passing on result could be interpreted as evidence of profiteering by house builders. This would be a troubling finding as house builders (as opposed to land developers) are not subject to any infrastructure charges. Evans-Cowley et al provide no discussion on this important finding.

It is interesting to note that Ihlanfeldt and Shaughnessey (2004), Campbell (2004) and Evans-Cowley et al (2005) also sought to quantify the pass back price impact to the original land owner. Their result varied widely from "inconclusive", to a \$0.04 to \$1.00 decrease (pass back). Hence it would appear that the extent of back shifting of infrastructure charges is still open to debate with even the empirical research being inconsistent and inconclusive (EVANS-COWLEY et al., 2005).

It is interesting that the majority of the studies result in a ratio of cost shifting, equating a \$1 (or \$1,000) of infrastructure charge to an increase in house prices proportionate to that charge. With the exception of Evans-Cowley et al, none of the research relates this price increase to average housing prices to consider the proportional increase in average house price to the consumer. This is an interesting omission considering housing affordability is at the core of each of these arguments. Further research could take into account how these increases in house prices translate to housing affordability.

In summary, despite Burge (2008) claiming that the studies carried out from 2000 onwards are based on more appropriate data and a more evolved methodology than those from the 1980's and 1990's, and some patterns arguably established, there are still wide variances in the findings and the methodologies applied. Been (2005) spends considerable time critiquing Ihlanfeldt and Shaughnessey's work, particularly the explanations for its findings,

which are addressed in the following section. In any event, her position is that “the literature overall raises serious doubts about whether the models are insufficiently or incorrectly specified” (Been, 2005, p163). Given Campbell’s (2004) work is largely similar in methodology and findings to Ihlanfeldt and Shaughnessey’s, and that Burge and Ihlanfeldt (2006) are also proponents of similar methodology, this situation may very well still exist.

5. OVERSHIFTING: BENEFIT OR BURDEN

In the preceding discussion, it has been established that the international theoretical evidence is conclusive that infrastructure charges increase housing costs. How much housing costs are actually increased by has been the subject of considerable study only in the US where the empirical models confirm not only passing on of infrastructure costs to home buyers, but significant “over shifting” of these costs. Whilst these studies remain inconclusive, not only in range of findings, but also in their explanation of why this over shifting occurs, a mean range of \$1.50 to \$1.70 for each \$1.00 of infrastructure charge is apparent. Discussion around the cause of this overshifting can be broken down into a review of the relative benefit or burden of infrastructure charges.

5.1. Burden: Uncertainty

Let us first discuss the burden effect. As stated previously, this over shifting phenomenon has been attributed in some US literature to infrastructure charges adding additional uncertainties and delay costs in the approval process, resulting in developers recouping more than the cost of the fees alone. So not only are impact fees passed directly onto homeowners, there is an overshifting effect to compensate developers firstly for the additional uncertainty (risk) and secondly a return of funds invested component, either for the developer, or its financier over the development period (Baden and Coursey, 1999).

Whilst this explanation appears intuitive and in line with common thinking, there are others within the US and Australia who argue the opposite, claiming that infrastructure charges actually increase certainty. Nelson et al (1992) supported by Burge (2008) maintain that infrastructure charges reduce uncertainty by virtue of timely provision of public infrastructure, that may expand the supply of buildable land. In her Australian review, Gurrin et al (2009) claim that the negotiated approach in the UK reduces risks for developers. This seems counter intuitive, with any unknown in the costing process adding uncertainty for developers. This is further compounded by the unpredictable delays (and costs) incurred in the negotiation process (Bramley and Leishman, 2005, Chan, 2009, Buitelaar, 2007).

This UK infrastructure charges system differs to that in the US and parts of Australia as it is a process based solely on negotiation between developer and the local authority, rather than being based on either future infrastructure construction cost estimates as is the case in much of the US and parts of Australia, or pre-set rates per dwelling (as is the now the case in Queensland, Australia). Reliance on negotiated outcomes is also argued to disadvantage smaller developers by virtue of factors such as influence, knowledge, cost and negotiating power (Evans, 2004a) and this can be interpolated to further disadvantage the home buyers in those smaller estates who may then be subject to not only higher charges, but also greater overshifting.

Perhaps this discussion is an oversimplification of infrastructure charging as a cost shifting concept, and further analysis of the actual policy implementation mechanism is required

to ensure comparisons (and assumptions) made are actually comparing like with like.

In any case, it can be concluded that if overshifting is due to developers recouping a higher risk premium to compensate them for the uncertainty associated with the local infrastructure charges regime, then homebuyers are bearing this additional cost burden by the amount of the overshifting. This is a critical concept for policy makers to be aware of when designing infrastructure charging regimes.

5.2. Benefit: Old View v. New View

An interesting proposition that been discussed sporadically in the US literature over the years is the concept of whether the increase in house prices due to infrastructure charges is a one off excise tax payable by the home owner for no net benefit, or capitalisation of expected future benefits arising from the provision of said infrastructure.

This is the concept of the “old view” versus the “new view” in infrastructure charge price effects, phrases first coined by Yinger (1998) and taken up again by Nelson and Moody (2003), Ihlanfeldt and Shaughnessey (2004), Burge and Ihlanfeldt (2006) and Burge (2008). The old view considers infrastructure charges as a traditional “excise tax on developers” (Ihlanfeldt and Shaughnessey, 2004) and does not take into consideration any value attributed by the homeowner to the amenity received from the infrastructure provided.

The new view assumes three key differences: 1) it incorporates the added amenity of the new infrastructure provided by those funds levied, 2) it assumes capitalisation of future local jurisdictional rates savings due to the pre-payment of new infrastructure costs by way of infrastructure charges and 3) it assumes new homebuyers are mobile (will move to an area that does not levy such fees if they do not wish to pay them/value the additional amenity) (Ihlanfeldt and Shaughnessey, 2004).

Under the new view, the increase in housing prices as a result of infrastructure charges is due to the home buyer’s willingness to capitalise into the cost of the home the value they derive from that infrastructure and/or perceived future rates savings. These costs will be overshifted to the extent that home buyers value more highly those benefits over the cost of providing them. Given the home buyer receives a benefit which it has paid for (by way of addition house price) there is no burden.

On the face of it, the new view assumes a mature market that has a well established and predictable infrastructure charge and local jurisdictional rating system. It also assumes this system and the quantum of costs is well understood not only the policy makers, the development industry, land holders and home buyers. It must also be assumed that the homeowner does in fact receive the value of the services and infrastructure provided by these additional fees in the foreseeable future. Further, there must be a precedent for a significant reductions in local jurisdictional rates for home buyers to be willing up pay the up front cost of such benefits. In a market such as Florida, where infrastructure charges have been common place since at least the early 1980’s, this general market knowledge may exist for the new view to prevail. However, not even Been is convinced of this: “An increase in the value of the home of between \$1.00 and \$1.68 per \$1.00 of impact fee on the promise of a rate rollback seems extraordinarily optimistic on the part of the homebuyers (Been, 2005, p 162).

In many parts of world, infrastructure charges are evolving policy. For example, in the State of Queensland, Australia the infrastructure charges regime by comparison is in its infancy. After five years of legislative reform, the most recent enabling legislation the Sustainable Planning (Housing Affordability and Infrastructure Charges Reform) Amendments Bill 2011, commenced in July 2011, which introduced maximum charges

across the State. This followed a period of considerable uncertainty of charges with protracted negotiation of outcomes within a supposed cost recovery framework. In parts of Queensland, infrastructure charges increased by more than 100% in the last decade (Productivity Commission, 2011). It is fair to conclude then that Queensland does not meet the criteria of a well established and predictable infrastructure charging system, and that the old view will prevail for a number of years after stabilisation of the current system.

As can be seen, the literature is still split on the reasons for the overshifting phenomenon associated with infrastructure charges. If overshifting is due to structural uncertainty, then home owners are bearing this additional burden, brought on by the nature and/or implementation of the infrastructure charging policy. However, if the new view premise holds, and infrastructure charges actually reduce uncertainty, then outstanding research question evolves. Rather than asking whether infrastructure charges increase housing costs, perhaps the question becomes: Does the home buyer gain the full benefit of the cost that they have paid?

Clearly, further examination of this overshifting phenomenon is required, and will be the subject of further more detailed research.

6. CONCLUSION

The purpose of this paper has been to build on existing North American literature, examining the international evidence that suggests infrastructure charges contribute to increased house prices and reduced housing affordability.

It has been found that there is an overwhelming body of theoretical evidence dating back to the 1970's that theorises who bears the cost of infrastructure charges for new homes. This evidence has been conclusive in its findings to the extent that current international literature now largely assumes it as given that infrastructure charges increase the price of new housing in the long run

The next step was to establish: if infrastructure charges increase house prices, then by how much? A number of empirical studies from the US were identified that confirmed significant overshifting, with house prices consistently increasing by greater than the amount of the infrastructure charge. It is somewhat surprising that no empirical work has been carried out on this topic outside of the US, despite the wide usage of infrastructure charges in many countries. It is important that policy makers are equipped with such information so as to fully understand the impacts of the infrastructure charges levied.

The paper concludes that whilst the empirical evidence of over shifting is largely consistent, with house prices found to increase by greater than the infrastructure charge, there remains considerable debate over whether this represents a burden to new home buyers or not and whether findings from one country can be directly transposed to another. Any future attempt to carry out such quantitative research will require further evolution of the models used to date, together with careful consideration of the various jurisdictional differences in schemes as well as local taxation regimes.

Despite the plethora of international research to date, a number of outstanding research questions remain unanswered, particularly for countries other than US.

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