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## Land Redevelopment and the Built Environment in Third-Wave Cities: Review and Synthesis

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### ABSTRACT

I seek to synthesize several different approaches to issues of urban land redevelopment and the built environment. The essay focuses on developments in the third and current historical wave of capitalist development. I describe the economic logic of land-use change with reference to both commercial and residential property. This logic has become intimately intertwined with global finance and this state of affairs has introduced new elements of fluidity and risk into the built environment. Issues of urban policy and the role of municipal authorities in shaping urban land markets are then considered. I describe how local government agencies increasingly pursue development projects in complex partnerships with representatives of the real-estate industry. In the second half of the paper, the overall argument is recast by reference to three important trends in regard to land-redevelopment and the built environment in third-wave cities, namely, the economic and architectural renaissance of central business districts, the widespread gentrification of inner-city neighborhoods, and the emergence of a new post-suburban phase of peripheral urban expansion.

### KEYWORDS

Built environment; financialization; land-use change; third-wave cities; urban redevelopment

### Urban Land and Property in Question

This paper takes the form of an extended essay in which I seek to synthesize several different approaches to questions of land redevelopment and the built environment in contemporary cities. My objective is to bring these approaches into juxtaposition with one another so as to shed fresh light on the ways in which they operate, their relations to the functional structure of the city, and how they are currently reshaping patterns of urban development.

A complex scientific and political question about the valuation, appropriation, and use of urban land and property emerges endemically within cities in capitalist society (Roweis and Scott, 1978). The substance of this question can be discerned within the phenomenon of the *urban land nexus* conceived as a mass of functionally interdependent assets such as factories, offices, houses, shopping facilities, public buildings, infrastructures, and so on, arranged in conjoint spatial patterns around a common center of gravity (Scott, 1980; Scott and Storper, 2015). Complex processes of redevelopment, piloted by intermediaries

like property companies, real-estate developers, and governmental agencies, are constantly in operation at the interface between this mass of urban *relata* and the wider socio-economic environment (Guy and Henneberry, 2002; Hackworth 2007; Topalov, 1974; Weber, 2015), though the ways in which these processes unfold vary significantly from one historical wave or phase of capitalism to another. In the present paper, I am concerned for the most part with urban redevelopment in the third and current wave of capitalism (with its primary expression in the new cognitive-cultural economy) in contradistinction to a first wave based on the nineteenth-century factory and workshop system and a second wave in the twentieth-century focused on Fordist mass production (Scott, 2017).

Many of the most striking transformations proceeding in the urban land nexus today (including advances in so-called smart-city technologies) derive directly and indirectly from the technological, economic, and political logic of this third wave of capitalism (See also Hutton 2008; Folmer and Kloosterman, 2017). Three important examples of these transformations and their relationship to land redevelopment processes are dealt with specifically later in this paper, namely, the functional and visual renaissance of central business districts (See also Fainstein, 2001; Kaika, 2010), the intensifying gentrification of low-income neighborhoods in the inner city (Clark, 2005; Lees et al., 2007; Scott, 2018), and the formation of extended polycentric post-suburban spaces (Hall and Pain, 2009; Keil, 2018). Local government organizations, too, have been subject to significant restructuring, notably by reason of the spirit of deregulation that has penetrated deeply into contemporary political life. These organizations are hence nowadays much given to an entrepreneurial mode of functioning that differs sharply from the more rigid Keynesian-welfare statist orientation of local government in the Fordist era (Harvey, 1989; Raco and de Souza, 2018). At the global level, tidal waves of liquid cash have been unleashed by corporate and governmental entities and are being fed down to the urban level by means of contrived fiduciary instruments managed by financial and property-development interests (Aalbers, 2012; Halbert and Attuyer, 2016). Much of the current ferment in the urban land nexus can be traced directly to these huge infusions of liquidity into the built environment. Caught up in this maelstrom are the lives of ordinary citizens, some of whom benefit greatly from the new state of play but vast numbers of whom pay a heavy price both in terms of their entrapment in the lower reaches of the cognitive-cultural economy and in terms of the displacement and disruption to which they are subject as those in control of the land redevelopment sector pursue their own peculiar version of creative destruction.

The discussion that now follows proceeds through four interrelated stages focused on (1) the logic of investment in the built environment, (2) the recent large-scale financialization of assets in land and built structures, (3) municipal strategies in regard to urban redevelopment, and (4) three synthetic illustrations of land and property redevelopment in major cities in the twenty-first century.

## Land and Property Investment Decisions

Investment decisions in urban land and property typically revolve around a complex combination of variables including location, land rent, built structures, the costs of any prospective rebuilding or renovation activities, and financial conditions in the economy at large. Investors will also usually want to assess the effects of prospective changes in the

urban environment on the eventual resale price of any property that they take over. We now consider these matters by first dealing with the specific case of land dedicated to commercial pursuits and by then treating the slightly more complicated case of land used for residential purposes. The argument that follows is couched in informal and descriptive language, but a more rigorous treatment will be found in the [Appendix](#), and the reader should turn to that section of the paper for a more detailed technical exposition.

### ***Redevelopment for Commercial Purposes***

Let us begin by building on some elementary ideas about investment in land that date back at least to the time of Marshall (1890) and by then extending this point of departure via some ideas related to Von Thünen's theory of land use and land rent (Scott, 1976).

Consider a situation where some given parcel of land in the city can be significantly revalorized by means of judicious investment and redevelopment. Let us suppose that an independent development company acquires the parcel. If, for the moment, we overlook anticipations about future land-use changes, the sale price to the company will consist of two basic quantities, namely, the present discounted value of all future rents that the land commands in its current state of development, and the depreciated value of any existing improvements (Munnneke, 1996; Rosenthal and Helsey, 1994). If the company engages in renovation or construction activities on the site, additional investment of money will be required, including charges for dismantling all or part of the existing structures. Obviously, the prospective resale price of the property after redevelopment must be such as to allow the company to recover the total acquisition cost plus all renovation or construction costs and to earn at least a normal profit on resale. At the same time, redevelopment may also generate a surplus amount or rent over and above this profit, and any such surplus will be commandeered by the development company as (interim) owner of the parcel.

Any such surplus will itself arise from changes, due to redevelopment, in the quantity of output produced on the land in relation to market prices together with changes in costs of production. (See [Appendix](#) for details.) More precisely, the surplus represents an increment to overall rent originating from the enhanced operational capacity of the parcel after redevelopment. Additionally, the surplus is equivalent to an opportunity cost on redevelopment, and this amount must be greater than or equal to zero before the company will proceed with the project. Redevelopment may also induce a material change of land use, but for simplicity we will take it that the same type of productive activity continues on the parcel after redevelopment as before. Two generic outcomes are now possible with respect to the use of the parcel. One of these can be designated as "land-use intensification," meaning that redevelopment leads to rising total production or revenue per unit land area. The other we shall refer to as "extensive land-use conversion," a special and—given the stringency of the conditions that render it feasible—an almost certainly less common type of change characterized as it is by diminished total production or revenue per unit land area (See [Appendix](#)). Land-use intensification of any parcel can occur in combination with either falling or (given offsetting increases in productivity) rising unit costs of production due to redevelopment. Extensive land-use conversion is feasible only where costs of production are falling, and even then, they must fall below a certain threshold level before redevelopment will be pursued. In theory, both types

of land-use change can occur at any location in the city. Two main points must now be made.

First, redevelopment via land-use intensification is a common phenomenon across the whole of the urban land nexus. Even the transformation of agricultural land into urban land is normally an exercise in land-use intensification. However, this type of land-use change typically appears in its most assertive forms at highly accessible locations such as the central city and associated satellite centers. Locations of these sorts already generate high rents per unit of output, which means *ceteris paribus* that any increases in production will yield additional rents at the same high value. In short, any unit of increased output at these locations will earn a rent at the going rate and this will accordingly augment the total rent per unit area. Provided that the costs of production can be kept from rising unduly as a result of redevelopment, there will thus be an especially strong incentive to intensify land use at central, high-rent locations (notably by means of increases in floor space).

Second, profitable redevelopment by means of extensive land-use conversion can only be accomplished in circumstances where production costs are sufficiently reduced to compensate for lowered output per unit area. Conditions like these are almost certainly less likely to occur in modern cities than those that encourage land-use intensification, but a hypothetical illustrative scenario might unfold where a property developer succeeds in assembling several individual parcels of land occupied by easily convertible buildings into a single unit of ownership. Economically viable conversion of the enlarged unit under conditions of reduced output and reduced operating costs might then be possible if the land is equipped with inexpensive improvements, perhaps with substantial open areas for outdoor storage. To the extent that extensive land-use conversion can be observed within the urban land nexus, it is probably confined for the most part to fringe areas where rents are already relatively low and where existing densities of development are minimal so that the costs of conversion are likely to be not too onerous. (See [Appendix](#).)

Once the intensive or extensive redevelopment of any given parcel of land has been completed, the price of the parcel will be equal to the developer's acquisition cost (see above), plus all expenditures on renovation or reconstruction, plus the present aggregate value of all future land-rent increases ascribable to redevelopment.

### ***Redevelopment for Residential Purposes***

Redevelopment for the purposes of erecting residential properties for sale or rent is in its essentials already covered by the argument set out above. But what of the individual householder who is intent on purchasing and rehabilitating a property for purely personal use? As in the case of a company that redevelops a property for commercial reasons, our householder must always, at a minimum, defray the cost of land acquisition as well as the cost of any reconstruction or renovation activities. However, we cannot in this instance identify a stream of commercial revenue created by redevelopment, and thus there is a question as to how we define the opportunity cost. The way around this dilemma, without invoking the circularity of an argument based on utility maximizing processes, is to use the expected resale price of the property when redevelopment is completed as a proxy measure for revenue. We then calculate the opportunity cost by subtracting the cost of acquisition and redevelopment from this amount. The expected price will itself be an estimate

based in part on an assessment of the interplay of many different variables, including the quality of the improved property, its overall accessibility, and the assortment of neighborhood externalities that Sampson (2012) refers to as “collective efficacy.” Despite the inevitably speculative element in any *ex ante* estimate like this, informed assessments can usually be made by reference to general market conditions. To be sure, there is always the further possibility that the householder, for personal reasons, will invest in the project to the point where the opportunity cost defined in this manner becomes negative. In these circumstances, the full amount of the monetary outlay on acquisition and renovation will be recoverable—if at all—only at some future date. Against this extra cost we must set the presumably added satisfaction of the householder over the time horizon defined by that future date.

### ***Temporal Pathways and Capital Switching in the Redevelopment Process***

The durability of the urban built environment implies that important leads and lags are likely to make it difficult for actors in the property market to optimize the scheduling of their buying and selling decisions (Brueckner, 1980; Capozza and Li, 1994; Miron, 2017). By the same token, the need to assess the economic viability of any redevelopment project in advance of its actual completion always introduces a degree of speculation into the decision-making process. One high-risk dimension in this regard concerns the amount of time that is allowed to lapse between purchasing a parcel of land and the initiation or completion of redevelopment operations. Thus, a developer may purchase a parcel at one point in time but may wait to redevelop the site until a later period if future upward shifts of prices in the surrounding urban environment are anticipated. A decision-making strategy of this sort, as Nowlan (1977) has shown, necessitates complex front- and back-end calculations in any attempt to make a finely-tuned assessment of the optimal amount of floor space or the type of building to be installed. A successful type of strategy, for example, would be to buy the land when potential revenues and rents are low, but to delay redevelopment until changing market conditions allow for enhanced profitable operation of the improved property. Clearly, the amount of time that is permitted to lapse between parcel acquisition and project completion will tend to vary inversely according to the current interest rate with its direct impact on any carrying costs.

Cities almost always display many physical traces of these calculated delays between parcel acquisition and the completion of conversion activities. Parts of the city adjacent to the central business district (CBD) are markedly prone to this syndrome in view of their susceptibility to the eventual outward expansion of high-density, high-revenue land use. One of the commonest expressions of the syndrome is the apparently paradoxical existence of empty spaces close to the CBD that are either boarded up or that serve as parking lots in the interim between land acquisition and redevelopment. The length of the interim itself is partly conditional on the local property-tax regime, and will tend to be prolonged where, as in many American cities, taxes are assessed on the basis of actual rather than potential land use. Alternatively, in cases where the land reserved for redevelopment is already equipped with structures capable of generating at least some level of income, the existing activities on the site may be allowed temporarily to function, and thus contribute to cutting overall costs. Little effort is likely to be dedicated to maintaining these structures, and hence they are liable to deepening blight prior to redevelopment.

The timing of land-acquisition and redevelopment decisions is also strongly sensitive to overall patterns of expansion and contraction in the property market. These patterns typically exhibit strongly cyclical behavior, especially in the office-construction sector (Ball, 1986; Barras, 1994; Maclaren, 2003). In a widely cited publication, Harvey (1985) has proposed a hypothesis that seeks to link this cycle in property development, or what he calls the “secondary” circuit of capital investment, to the changing fortunes of the “primary” sector, i.e., commodity production as a whole. The main thrust of the hypothesis is that new capital investments will be “switched” from commodity production into property development when over-accumulation starts to become evident in the former segment of the economy, signaling a looming business downturn. In this manner, the property sector is presumed to act as a sort of safety valve by temporarily staving off a deepening crisis of profitability. There has been little empirical examination of this hypothesis, and the few extant attempts to test it focus on symptomatic expressions of switching rather than explicit examination of over-accumulation as such. Beauregard (1994), basing his analysis on comparisons of trends in US real estate markets with the performance of the rest of the economy over the 1970s and 1980s, finds little or no evidence in favor of the hypothesis; Christophers (2011), who examines British data on the changing share of real-estate investments in pension funds from 2000 to 2007, claims to have discovered positive (but indirect) evidence in its favor. As it happens, a counterargument to Harvey’s hypothesis can be constructed on the basis of the literature in general which reveals the existence of a strong if irregular positive relationship between real-estate cycles and the economic cycle as a whole (See also Barras and Ferguson, 1985; Jadevicius et al., 2017; Leamer, 2015). The evident deduction that can be drawn from this information is that the inter-sectoral rebalancing of profit rates will in all likelihood have occurred long before the appearance of any over accumulation crisis in sectors other than property development. In brief, the switching idea remains a bold hypothesis, but there are also reasonable grounds for a degree of skepticism as to its ultimate validity.

## **Real-Estate Markets and Finance**

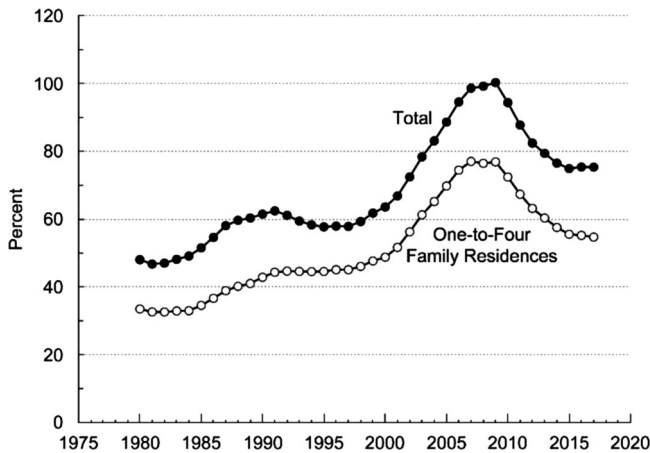
Over much of the period since the end of World War II, funding for real-estate construction and purchase in the United States was largely undertaken by highly regulated commercial banks and savings and loan institutions via mortgage agreements with prospective property owners. As third-wave capitalism has forged ahead in recent decades, bringing with it the rise of a powerful globalized financial sector underpinned by advanced data processing and communications technologies, important changes in these funding arrangements have come about with major repercussions on urban structures, above all in the United States but in many other parts of the world as well (Aalbers 2012; Christophers, 2015; Haila 2016; Harvey, 2012; Rutland, 2010). In particular, the deregulation of the US banking sector since the early 1980s, combined with snowballing innovation in financial technologies and engineering, has unleashed a stream of new investment practices in the built environment, not all of them benign (Fernandez and Aalbers, 2016). In the United States, one of the first intimations of the potentially negative impacts of these shifts was the savings and loan crisis brought on by relaxation of lending standards in the second half of the 1980s.



However, it was the repeal of the Glass-Steagall Act in 1999, and the further relaxation of banking rules that opened up the pathway to the severe financial crisis that began in 2007. Among the many other effects ascribable to the repeal of the Act was the removal of impediments to the fusion of the business operations of commercial banks and financial institutions. This fusion was then accompanied by a deepening engagement of financial institutions in mortgage lending and in the financialization of real-estate assets. The overall strategy of financialization was accomplished by means of comprehensive income-generating securities or collateralized mortgage obligations (CMOs) such as mortgaged-backed securities (MBS) and structured investment vehicles (SIVs) based on the aggregation of large numbers of individual mortgages into massive investment pools (Gothan 2012; O’Neil, 2018). The new-found ability to securitize real-estate debt in this way offered enormous windfall profits to financial institutions, including global giants like Bear Sterns, Lehman Brothers, Merrill Lynch, J.P. Morgan, and Wachovia (Crosby and Henneberry, 2016). Institutions like these, in partnership with commercial banks, issued commercial paper that in effect shifted money from the international financial system down to individual real estate purchasers and then transferred the concomitant interest payments back up to holders (many of them insurance companies and large pension funds) of the paper. Financialization was further reinforced by the rise of real estate investment trusts or REITS acting as both managers of physical properties and as investors in real-estate construction projects. Waldron (2018), Aalbers (2017), and Gothan (2012), among others, have pointed out how all these different currents transmute immobile property into a mirror state of placeless financial liquidity. The deepening integration of financial and real-estate markets and the easy credit that ensued led to an explosion of mortgage debt and property investment not only in the United States but also in other countries that pursued aggressive deregulation after the 1980s. The accelerated pace of land redevelopment that accompanied the resulting property boom had major impacts on the urban landscape. Important symptoms of this trend were rapid upward shifts in rates of home ownership, major expansion of business premises in CBDs, and the flowering of urban mega-projects, many of them in old industrial quarters such as the Zürich West development (Dörry et al., 2016), the Docks of St Ouen in the suburbs of Paris (Guironnet et al., 2016), and the Bicocca Technocity in Milan (Kaika, 2016). These latter projects illustrate another important feature of third-wave urbanization, namely, the assertive recycling and upgrading of derelict Fordist industrial sites in pursuit of property-led urban regeneration.

To many observers in the early years of the twenty-first century, this figurative liquefaction of real estate into financial assets held out the promise of significant improvements in the operational efficiency of urban property markets and all the more so given its basis in advanced digital technologies. With the aid of these technologies, market makers could greatly enhance their practical capacity to digest vast amounts of information, enabling them constantly to reevaluate changing economic conditions. For a while, it seemed as though property markets might continue indefinitely to operate at this new tempo as they entered into a period of full-blown expansionary thrust after the turn of the twenty-first century, though at the cost of rapidly soaring house prices. The data displayed in Figure 1 clearly illustrate the course of the housing-price bubble in the United States over the 1990s and through the early years of the twenty-first century. As shown in the figure, the total value of outstanding mortgages (less farm mortgages) as a percentage





**Figure 1.** Total mortgage debt (omitting farm mortgages) and mortgage debt on one-to-four family residences in the United States; both series are expressed as a percentage of US GDP Sources: Federal Reserve Board and Bureau of the Census.

of GDP increased from 48.1 percent in 1980 to 63.6 percent in 2000, and then, as the global credit boom intensified, rose sharply over the next several years before flattening off in the period from 2007 to 2009 (reaching an absolute peak of 100.3 percent in 2009) to be followed by a massive and extended downturn. [Figure 1](#) also indicates that the relative value of mortgages for one-to-four family residences in the United States runs in parallel with these aggregate data. Concomitantly, house prices increased from a value of 92.7 on the Case-Shiller US National Home Price Index in January 1999 (the year the Glass-Steagall Act was repealed) to a peak of 184.6 in July 2006, a total increase of 99.1 percent or just over 13.0 percent a year (Kim and Renaud, 2009). From this peak to February 2012, house prices nationwide declined by 27.4 percent, and the peak itself was not to be surpassed again until December 2016. To compound matters, the collapse ignited a massive and widespread economic crisis, initially in the United States (Ashton, 2009), and then in other major capitalist countries, though at different rates and intensities given national differences in housing markets and housing finance systems (Fernandez and Aalbers, 2016; Kim and Renaud, 2009).

The major cause of the breakdown of real estate prices after 2009 can be traced back to the increasingly indiscriminate disbursement of mortgage funds by lending institutions in response to deregulation. As the boom gathered momentum, more and more subprime mortgages were incorporated into commercial instruments that were then sold over financial markets. In earlier times, banks and savings and loan institutions had typically exercised considerable caution in their mortgage-lending practices, but in this new more liberal climate, lenders calculated that by bundling together mortgages issued to a mix of individuals with poor and high credit ratings they could fine-tune risk levels without compromising the marketability of the corresponding financial instruments. Discretionary caution was accordingly relaxed, and commercial banks along with their financial partners greatly expanded their mortgage lending programs while simultaneously tapping into new markets among low-income minority borrowers by means of widespread predatory lending (Dymski, 2012). The application of discriminatory red-lining methods had traditionally limited the degree

to which these borrowers could gain access to mortgage funding, but they were now being actively encouraged to take out loans even in cases where their ability to sustain payments over the long run was clearly in doubt. These predatory lending programs remained generally viable as long as interest rates were falling and house prices increasing so that the equity in the hands of individual homeowners continued to rise, but both lenders and borrowers rapidly encountered severe headwinds as reverse trends began to appear. In view of these trends, more and more mortgage holders were unable to meet their debt obligations, and mounting defaults and foreclosures started to impose considerable stress on the banking and financial system (Ashton, 2009). In many instances, over-leveraged homeowners, especially in low-income neighborhoods, simply abandoned their houses to their creditors (Halbert and Attuyer, 2016). The end result was widening distress in the housing market and rapid diffusion of recessionary conditions through the rest of the economy.

In response to these and allied problems, the federal government of the United States passed the Dodd–Frank Wall Street Reform and Consumer Protection Act in 2010, in an attempt to improve financial stability, and, by means of Title XIV of the Act, to reign in predatory mortgage-lending practices. The Act also reintroduced elements of the earlier Glass-Steagall legislation by limiting financial speculation on the part of commercial banks. Despite this attempt at remediation, many of the stipulations of the Dodd-Frank Act are currently under high-pressure attack in Washington, and at least some watering down of the main thrust of the Act seems likely. Even if the Act remains fully in force, the overall trend towards deregulation and financialization in the last few decades has introduced a new and troubling degree of instability into urban real-estate markets, and has contributed significantly to amplifying the gap between the fortunes of those at the top and those at the bottom of the income ladder.

## **Municipal Policy Tools and Initiatives**

Public authorities have always played a significant role in shaping capitalist urbanization processes, and their efforts have always been intensely focused on two broad goals, namely, the correction of market failures in the urban land nexus when these lead on to socially and politically unacceptable outcomes, and the pursuit of collective projects deemed necessary or desirable for urban growth and social order. It follows that municipal oversight of land redevelopment and property conversion projects is typically a major component of these efforts. This oversight also invariably reflects the influence of political demands exerted by different urban constituencies. In American cities in particular, powerful formal and informal growth coalitions repeatedly bring pressure to bear on municipal decision-making in general, and perhaps most forcefully in regard to issues of real-estate investment and development (Molotch, 1976; Stone 1987).

All that being said, the modalities of governance and collective action in the urban land nexus vary significantly over historical time. In the era of Fordism, they were deeply inflected with the spirit of Keynesian-welfare statism. In North America and much of Western Europe, this meant that public intervention in issues of land redevelopment and the built environment was heavily directed to urban renewal programs, infrastructure planning, public housing investments, and the provision of sundry social facilities. Large-scale urban renewal in the United States was initiated by the 1949 Housing Act and was implemented for the most part in order to deal with the urban ravages directly and

indirectly brought on by the accelerating flight of industry and employment from central cities (Brenner, 2004). Much public housing was constructed by city governments in inner city areas and elsewhere at this time in order to accommodate working-class families displaced by clearances of blighted neighborhoods.

With the waning of the Fordist regime in the late 1970s and early 1980s, and the formation of the early stages of third-wave capitalism, many of these Keynesian-welfare statist policy arrangements were severely curtailed and alternative strategies of governance focusing on deregulation and the extension of market order were implemented in their place. Along with this sea change came a mounting concern with efficiency and urban economic development issues that was all the more urgent in view of the damage wrought by the collapse of Fordism and the spreading influence of global capitalism. Harvey (1989) was an early and astute observer of this turn of events, which he diagnosed in terms of a shift from managerialism to entrepreneurialism in urban governance. Harvey also suggested that a prime symptom of this shift was the rising importance of private-public partnerships involving local government and diverse business interests in the search for increased rates of urban and regional growth. In the three decades that have elapsed since Harvey published these ideas, the creed of entrepreneurialism—or perhaps, better yet, project-oriented planning—has continued to extend its hold over the practices of local governments as manifest in a multifaceted array of policy tools and incentives devoted to facilitating private investment in large-scale urban development projects and other ways of promoting urban prosperity and repute, including city branding operations. Iconic building designs by celebrated international architects are a striking symptom of this city-branding urge (Fainstein and Fainstein, 2012), as represented, for example, by the classical cases of the Bilbao Guggenheim Museum inaugurated in 1997 and Kuala Lumpur's Petronas Towers, officially opened in 1999. Initiatives of these sorts enrich the stock of built forms of the city while simultaneously serving as beacons that help to guide inflows of capital and skilled migrants from elsewhere.

Land redevelopment and property conversion processes are, of course, deeply intertwined with urban growth and change, and public agencies work intensely to channel them into desired configurations. The specific policy resources at the command of these agencies include traditional planning instruments like zoning, land-use regulations, and debt issuance as well as more recently devised financial provisions that among other things facilitate the ability of municipalities to operate in customized collaborative relationships with private developers and construction companies. Local governments also typically have selective authority to override rights of private ownership that might otherwise create bottlenecks to urgent or socially imperative tasks of redevelopment. Continued if relatively restrained investment in public housing and other welfare objectives remains an element of the responsibilities of municipal agencies, but the most active engagement of these agencies in the matter of land redevelopment and property conversion today is devoted to promoting a growing and efficient urban economy with strong competitive advantages at the national and global scales. A common form of this activity is property-led regeneration, especially in cities with extensive tracts of land that have been left in a state of dilapidation as a legacy from the old Fordist regime. Public participation in land and property upgrading for the purposes of regeneration extends across the entire range of land use types from commercial real estate to residential neighborhoods. On the one side, public agencies are increasingly involved in subsidizing and promoting land-use changes calculated to boost local

participation in dynamic third-wave sectors like business and financial services, the cultural economy, and technology-intensive industries, particularly in parts of the city such as the CBD, decaying warehouse and factory districts, and extensive peripheral areas suitable for business centers and science parks (See also Kaika, 2010; Ponzini and Nastasi, 2011; Scott, 2011). On the other side, policy measures such as building clearances, rezoning, property-tax increases, and the abolition of rent controls are frequently brought to bear on low-income residential districts in efforts to promote neighborhood redevelopment. These measures in turn are apt to accelerate the gentrification processes that are increasingly evident in third-wave cities (Hamnett, 2003; Ley, 1986; Zukin, 1982).

Private–public intervention in the built environment is nowadays frequently coordinated by urban development corporations with wide powers of intervention. Corporations of this type are familiar elements of governance structures of cities in the United States and Britain where they function above all as agencies of property-led regeneration. In France, analogous institutions exist in the guise of government-sponsored *Etablissements Publics d'Aménagement* (EPA), or Public Planning Agencies, whose work is facilitated by long-standing legal arrangements that empower municipalities to designate given tracts of land as *Zones d'Aménagement Concerté* (ZACs) or Collaborative Planning Zones. The powers invested in these French institutions make it possible to establish flexible partnerships between local authorities and private corporations in the tasks of land assembly, infrastructure provision, and construction (Bonneval and Pollard, 2017). Financial packages involving both public subsidies and private investments typically play an important part in mobilizing ventures like these.

In addition to the forms of public support for property development as described earlier, tax-increment financing agreements or TIFs are now widely and increasingly deployed by local governments in the United States as a way of stimulating private intervention in the built environment. TIF-based redevelopment procedures begin with the official designation of a specific site or area in the city as a target of renewal and regeneration. The actual redevelopment of a given parcel of land can usually be expected to generate increases in tax revenues, and TIF agreements are designed precisely to securitize these increases. Thus, once a given parcel in the city is designated for rehabilitation under a TIF agreement, the municipality enters into a contract that assigns the tax revenue increases to a developer, or a consortium of developers, in exchange for specified construction and improvement work. “In this way,” as Weber (2010: 258) writes, “cities obtain capital by turning the rights to their own ... property-tax base into standardized tradable assets” (See also Pacewicz, 2013; Savini and Aalbers, 2016). TIFs, moreover, not only serve as a technique for subsidizing private construction operations, but also as a means of keeping the relevant monetary transfers off the municipal budget and hence of depoliticizing at least some of the redevelopment process. The property boom of Chicago that lasted from 1996 to 2007 can in large degree be ascribed to the widespread implementation of TIF agreements, and by 2008, Chicago had 160 different TIF districts covering as much as 30 percent of the city’s land area (Weber, 2010, 2015).

### **Composite Outcomes: Three Illustrative Vignettes**

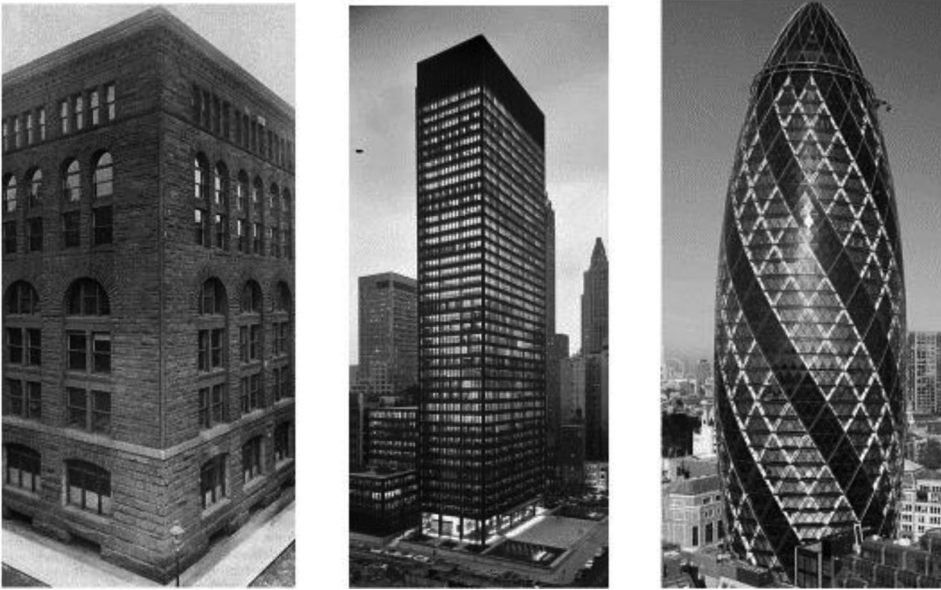
Each historical phase of capitalism triggers specific kinds of readjustments in the built environment together with definite forms of social disruption and political contestation.

The current expansionary phase of third-wave capitalism has also brought in its train a series of very specific shifts in modalities of physical redevelopment and in the character of the built environment. In the discussion thus far, I have mostly focused on analysis of the discrete systematic elements that make up these modalities. In the present section, by contrast, I offer an illustrative triad of more synthetic views that bring these elements into mutual interrelationship in the context of complex aggregations of built forms. The argument proceeds with special reference to land-use intensification in CBD areas, gentrification in downtown neighborhoods, and the geography of post-suburbia. These cases illustrate, each in its own peculiar way, how land markets together with private and public redevelopment processes both shape and respond to the functional dynamics of cities.

### ***The CBD: Aestheticized Land-Use Intensification***

The CBDs of capitalist cities have always been susceptible to insistent redevelopment via land-use intensification. This process is a response to the elevated land rents that can be extracted as a consequence of the emergence of central business districts at the maximally accessible location relative to the rest of the urban land nexus. The physical signs of this condition are evident in the ever-changing array of high-rise buildings that typify these districts. Homer Hoyt (1933: 335) recounts that in the Chicago of his day “thirteen storey skyscrapers with a structural life of a century or more have been torn down to give room for twenty-two or forty-four-storey tower buildings.” These property-clearance activities in the CBD, and the construction of newer and more efficient structures, tend to proceed in a cyclical rhythm, and, as Barras (1994) shows, are usually most apparent at times when the economy is booming.

The buildings of the CBD are almost always the highest, most visible, and most expensive edifices in the urban land nexus. They also house many of the most prestigious business, financial, and service functions in the city, forming dense concentrations of generally high-level professional, managerial, and administrative employment. These functions have always dominated CBD economies in capitalist cities, but they have taken on augmented importance in the current cognitive-cultural era where high-level intellectual and affective forms of labor lie at the core of much of the productive system. This combination of visibility and prestige in so many of the buildings in the CBD is conducive to another major feature, namely, the profusion of architectural signs and symbols that adorn these buildings and that testify to their special status as icons of power and wealth. The built structures of the CBD thus tend to embody more dramatically than any other part of the city the distinctive forms generated by the synthesis of prevailing construction technologies and aesthetic motifs (often encoded in ideologies of architectural practice) that reflect the dominating temper of the times (Cuthbert, 2006). Each historical generation of CBD building activity leaves a unique mark of this sort. Consider [Figure 2](#), which portrays three different generations of quintessential central-city buildings, each of them imprinted with a historically-specific set of design principles. The chunky Marshall Field Wholesale Store in Chicago with its exterior load-bearing walls is an example of vigorous land-use intensification in the late nineteenth-century and a forthright statement of the doctrine that form should follow function. The soaring curtain-walled Seagram Building in mid-twentieth-century New York proclaims, for its part, the Miesian doctrine that less is always more. The neo-baroque Swiss Re Building in twenty-first-century London



**Figure 2.** Three generations of land-use intensification and architectural form. From left to right: (1) Form follows function: Marshall Field Wholesale Store, Chicago, Henry Hobson Richardson, (1887). (2) Less is more: Seagram Building, New York, Mies van der Rohe, (1958). (3) Iconic global architecture of the twenty-first century: Swiss Re Building, London, Norman Foster and Partners (2003). Illustrations by courtesy of the Creative Commons.

exhibits the enhanced construction capabilities opened up by new digital technologies in combination with advanced building materials while capturing expressive possibilities appropriate to an icon of global corporate finance. Each of these buildings illustrates how, at different historical moments, the search for profitable self-assertion at the pinnacle of capitalist enterprise gives rise to processes of aestheticized land-use intensification that in turn beget a landscape of robust functionality and high symbolism.

Sklair (2005, 2010) has observed that styles of architectural expression in the cores of major world cities today also convey something of the self-conception of the transnational capitalist class whose members circulate with increasing frequency across the globe from one major bastion of finance, business, and culture to another. In addition to the Swiss Re Building already cited, spectacular instances of the monumental structures that constitute these bastions at the cores of major metropolitan areas in North America and Western Europe are One World Trade Center in New York, London's Canary Wharf, and La Défense in Paris. Each of these cases testifies to the power and influence of governmental agencies in motivating private developmental forces. Burgeoning city-regions of the Global South participate actively in this trend as well, with striking illustrations being offered not only by Kuala Lumpur's Petronas Towers, but also by the Taipei 101 skyscraper in Taiwan, and the Burj Khalifa in the United Arab Emirates (See also Schmid et al., 2011). Additionally, CBD areas are prime sites for ostentatious cultural projects such as Disney Hall in Los Angeles, the Shanghai Cultural Plaza, London's Royal Opera House or Tokyo's National Arts Center, all of which affirm their individuality by means of assertive symbolic gestures. These projects, in combination with other design-intensive CBD



buildings, exert powerful branding effects that endow their cities with a strong global image (Anttiroiko, 2014; Dinnie, 2011).

### ***Gentrification of Residential Property***

Just as the CBDs of numerous major cities are currently undergoing dramatic transformation via land redevelopment and reconstruction, so too residential neighborhoods in inner cities and elsewhere are experiencing significant rehabilitation. One of the commonest instances of this process is the peculiar form of residential land-use intensification generally referred to as gentrification.

“Gentrification” is a term that has taken on a multitude of different meanings since it was first coined by Glass (1964) in reference to the London housing market in the early 1960s. It is now widely applied to virtually any form of property conversion that entails upgrading, including the redevelopment of commercial properties. In this discussion, however, I restrict the term to its original use as defined by Glass to signify a change of land use where higher socioeconomic groups appropriate and upgrade housing vacated—compulsorily or voluntarily—by lower socioeconomic groups. Gentrification in this sense is mostly to be found in inner-city neighborhoods that have traditionally been occupied by working-class and low-income families. As such, it entails the replacement or modification of existing buildings and the construction of more capacious and more expensive structures in their stead. In many cases, the gentrification of a given neighborhood proceeds in a piecemeal manner by private individuals who purchase single properties and renovate or restore them on an individual basis; in other cases, professional investors and developers operating at a relatively large scale also foster gentrification, notably by redeveloping land for high-rent multiple-family apartment complexes. Municipal authorities frequently encourage these activities by means of incentives like TIF arrangements, direct subsidies to developers, and land clearances

In a series of influential papers, Smith (1979, 1987) claimed that the basic impulse motivating individuals and professional developers to engage in gentrification in US cities derives from the existence of a depression or gap in the urban land-rent surface. According to Smith, this “rent gap” is an observable datum that regularly makes its appearance in low-income residential neighborhoods close to the city center, i.e., in sections of the urban land nexus where rents are lower than the theoretical level they would achieve if the land were given over to what Hurd (1903) called its “highest and best use.” Smith suggests that the rent gap then encourages gentrification by making it possible for investors to earn speculative gains by means of property conversion. Certainly, where rent gaps are present, they would tend to reinforce the proclivity to property upgrading, yet it must also be pointed out that rent gaps are neither necessary nor sufficient for gentrification to occur (Hamnett, 1991). This claim can be validated at once by reference both to the earlier discussion of the economic rationale behind land redevelopment, and to the more analytical argument presented in the [Appendix](#). In brief, the incentive to redevelop property is not just a function of the rent or price of the land, but also, and critically, of two other variables, namely, the monetary value of the existing improvements on the land, and, more importantly, the projected value of the land and its improvements once reconstruction and/or renovation have been accomplished. Moreover, if the opportunity cost is positive, even initially high-rent land is



susceptible to redevelopment or gentrification (as exemplified by land that is sufficiently densely occupied by low-income families as to command a high rent per unit area). Incidentally, this is not an argument against the empirical existence of rent gaps as such, and in fact there is much evidence of their presence in American cities (Scott, 2018); but it is an argument to the effect that rent gaps are not, as Smith (1979) avers, the *sine qua non* of gentrification.

In order to close the analytical circle, we need to inquire as to why it is that opportunity costs on gentrification are currently positive at many given inner-city locations whereas the same locations remained impervious to gentrification in earlier decades, with or without the presence of a rent gap. In this regard, there is now a mounting body of theory and evidence suggesting that the essential logic of inner-city gentrification can be captured by reference to the changing employment structures of third-wave cities. To begin with, there has been a very marked increase, both absolutely and relatively, in the numbers of white-collar workers in major cities as the cognitive-cultural economy has grown apace, and significant proportions of the employment opportunities for these workers are concentrated in CBD areas. Concomitantly, residential neighborhoods possessing high levels of accessibility to these areas are becoming more and more attractive as foci of housing for white-collar workers (Hamnett, 2003; Ley, 1986; Zukin, 1982). A detailed statistical analysis of these relationships is presented in Scott (2018) for the case of Los Angeles. The *zeitgeist* of contemporary society is also undoubtedly influential in these matters, given the increasing disenchantment of many middle-class individuals with traditional suburban life in contrast to the widening appeal of central cities as hubs of cultural consumption and associated amenities (Bridge, 2001; Clark, 1992).

Then again, gentrification is rarely, if ever, a purely neutral or apolitical affair, not only because it frequently results in involuntary displacement of families from traditional low-income communities, but because even when the departure of these families appears to be purely voluntary they are often driven to leave by locally rising land values, rents, and taxes. Renters, above all, can be easily evicted on the termination of their lease. The use of physical threats and eviction on the part of unscrupulous landlords, eager to reap the benefits of higher property values, has also been widely documented. And, as analysts like Slater (2006, 2008) and Wacquant (2008) have shown, city councils intent on fostering property upgrading and increasing the tax base within their jurisdictions are often all-too-willing to participate in measures that favor gentrification in deprived neighborhoods at the expense of long-standing residents. Policy measures that function in these ways include the abolition of rent controls, the tightening of building codes, rezoning for single-family houses, increases in property taxes, and the offer of subsidies to first-time house purchases in “under-served” areas. It is no surprise, then, to note that when municipal agencies, private households, or development companies begin to gentrify a given neighborhood, the usual outcome is political mobilization and protest on the part of low-income residents who are typically at risk of being penalized by this turn of events (see, for example, Blomley, 2003 and Lees et al., 2015).

### ***Suburbia, Post-Suburbia, and Sprawl***

For a century and more, the expanding suburban fringe of American cities has been a prime terrain of land redevelopment by both public and private interests. The suburbs

in the early decades of the twentieth century were principally given over to low-density residential communities where much of the growing white-collar fraction of Fordist society lived, though life in these communities was never as homogeneous as it is sometimes claimed to have been. The suburbanization of white-collar residential activity was a locational arrangement that offered effective geographic and social distance from the predominantly blue-collar neighborhoods of the inner city combined with a hospitable environment in which to satisfy what were then taken to be the domestic needs of the white-collar fraction, including detached and semidetached housing in spacious lots. With increasing urban population and ever-rising rates of car ownership the suburbs expanded relentlessly outwards, a trend that was facilitated more often than not by the policies of compliant municipalities in support of the acquisition and conversion of agricultural land and investment in basic infrastructure such as roads and utility lines.

By the late 1940s, large property-development companies were also assertively facilitating suburban expansion. Levittown, built between 1947 and 1951 outside New York, was a pioneering large-scale planned community in the suburbs, as was Lakewood, built between 1949 and 1953 in Los Angeles County by the Lakewood Park Company. These two projects were archetypes of post-War mass-produced suburbs in America with their low costs per residence made possible by economies of scale based on the synchronized redevelopment of extensive tracts of land. Analogous projects proceeded in Britain and France in the 1950s and 1960s via both suburban housing construction and the development of new towns to accommodate the expansion of London, Paris, and other major urban centers. In France, much of this suburban expansion took the form of high-rise, rent-subsidized HLMs (*Habitations à Loyer Modéré*) constructed by private-public partnerships set up within the framework of the ZAC legislation described earlier (see also Preteceille, 1973). High-rise construction in the French suburbs made it possible not only to achieve economies of scale in construction but also to achieve relatively high levels of efficiency in infrastructure provision by means of augmented population density at designated sites.

Despite the role of public authorities in North America and Western Europe in helping to accelerate the pace of suburbanization in the decades following World War II, selectively remedial attempts were also made to restrain the outward expansion of cities and to limit the negative effects of sprawl. Perhaps the most ambitious but also one of the most controversial remedial efforts in this direction was the British Greenbelt legislation, first formalized in the Town and Country Planning Act of 1947 and subsequently imitated in a number of other countries. Greenbelt regulations are normally designed to preserve the countryside in designated swaths of land around the city by severely limiting the amount of space that can be converted to building use. In more recent times a variety of smart-growth policy measures have also sought to curtail suburban sprawl by such means as regional transport plans that put constraints on car use while encouraging the expansion of rapid transit systems. These and other anti-sprawl measures are currently subject to forceful debate between partisans of high-density urban development and a growing body of critics who argue that anti-sprawl policies are driving up property prices in many cities, thereby creating a crisis of affordable housing and hampering economic growth (cf. Cheshire et al., 2014).

Notwithstanding widespread attempts to limit the outward expansion of cities, sprawl typically continues to advance steadily outwards, often in a leapfrog fashion wherever

obstacles are put in its way. The outward expansionary thrust of the urban periphery is accompanied and complemented by the growing heterogeneity of land uses in the suburbs as exhibited by the growing social variation of residential neighborhoods together with the continued growth and diversification of industrial, office, and retail activities. In addition, some of the most ambitious cases of recent land redevelopment in the suburbs are focused on major recreational and tourist attractions with global appeal such as the Disneyland parks and resorts (descendants of the original Disneyland in suburban Los Angeles) that have been established in Marne-la-Vallée, Hong Kong, Shanghai, and Tokyo. The expansive technology and software parks, new office complexes, university and college campuses, malls, shopping plazas, sports stadia, convention centers, and upscale gated communities that now thrive in suburban areas, too, represent advanced elements of this developmental model in the peripheries of global city-regions (Teaford, 1997). So great is the contrast between much of suburbia in this third wave of capitalist development and its classical form in the pre-War period that it is nowadays often referred to as a *post-suburban* phenomenon (Keil, 2018; Kling et al., 1991; Phelps, 2015). In many respects, indeed, the evolving built environment of post-suburbia with its emergent polycentric structures and its deepening internal socioeconomic differentiation is increasingly coming to resemble a sort of fractal echo of the city as a whole.

### **The Contradictory Logic of Urban Redevelopment**

I have argued in this paper that the fountainhead of much of the turbulent redevelopment, rebuilding, and re-purposing activity that is proceeding in the urban land nexus today coincides with the restoration of rapid but uneven urban growth in the twenty-first century in the context of the distinctive socioeconomic dynamics of third-wave capitalism. The same dynamics are revealed in and partially fashioned by the land uses and built forms that constitute the physical expression of urban life in this version of capitalism. These phenomena are produced by diverse structures of agency responding to both market and political signals, most notably the property development sector and financial institutions, together with local government organizations with their growing preference for entrepreneurial-interventionist procedures. These trends are most visible in North American and Western European cities, but they are apparent in many other areas of the world as well, including parts of Asia and above all China. To be sure, there is currently much debate about the validity of cross-cultural referencing in urban studies, and, in a recent paper, Wu (2016) has correctly pointed out that the shape and form of China's cities have many unique features that reflect the country's very distinctive institutional and political character (see also, Roy 2009). Contrariwise, and in purely formal terms, China's cities are evidently coming to display at least some of the broad developmental outcomes described in this paper, such as aestheticized land-use intensification, gentrification, and post-suburban growth (See, e.g., He, 2010; Lin and Zhang, 2017; Liu et al., 2018; Wu and Phelps, 2011; Zacharias and Yang 2016). This is not the place to attempt to resolve this particular debate, except perhaps to say that as capitalism extends its hold over the global economic order, so certain basic forces and trends of land development (including ever closer cooperation between local governments and private financial interests) can be identified across a far-flung swath of cities. The continuing diversity of institutional and cultural contexts from one city and one country to

another means that these pressures typically play out in very different kinds of empirical detail, but more in the way of speciation within a wider generic category than as symptoms of absolute incommensurability (See Scott and Storper, 2015; Storper and Scott, 2016)

Land redevelopment is, and always has been, a highly lucrative sector of the economy. In third-wave cities, in particular, enormous profits and rents are being extracted from the multiple opportunities for property construction and conversion in the urban land nexus. The monetary gains acquired in this manner have served to swell the coffers of banking and financial institutions, property owners, development corporations, building contractors, real-estate investors, land assembly agencies, and the like. At the same time, a significant portion of the risks that these parties face is socialized by governmental agencies, which, in the current conjuncture, are prone to offer generous subsidies and other cost-reducing incentives for redevelopment activities. The benefits that flow from these arrangements are almost never apportioned out in socially equitable ways. Equally, vast numbers of low-income families have paid a heavy price as inner-city neighborhoods have been redeveloped to make way for residential gentrification and new commercial ventures. Many low- and medium-income families, too, have been severely disadvantaged by the sub-prime mortgage-lending fiasco that began in 2007. The social dislocations wrought by these events are compounded by the escalating property values and the persistent shortages of affordable housing in large urban areas at the present time. Third-wave cities are to all intents and purposes locked into a *modus operandi* that systematically endows some portions of intra-urban space with cachet and glitter while others are condemned to marginality and decline (Currid-Halkett and Scott, 2013). Municipal authorities may offer grudging remedial measures in response to the social dislocations that are engendered by these trends, but in the absence of root-and-branch reform, the profit-driven evolution of the urban land nexus seems destined to pursue its customary logic through endless endemic predicaments and political conflicts.

## Disclosure Statement

No potential conflict of interest was reported by the author.

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## Appendix

### The Elementary Principles of Property Redevelopment

In order to simplify matters, the discussion here will be limited to considerations of decision-making in regard to the upgrading of purely commercial, non-residential property.

Consider any parcel of urban land that yields the quantity  $x$  of a given type of output every year. The annual rent earned by *each unit of output* from the parcel is

$$r = \pi - c, \tag{1}$$

where  $\pi$  is the market price and  $c$  is the unit production cost including normal profit;  $c$  also incorporates any location-dependent quantities such as transport costs.

The market value or acquisition cost,  $L$ , of the land (net of any improvements) will be equal to the discounted present value of all future rents accruing to the parcel, i.e.,

$$L = xr/i = \rho/i, \tag{2}$$

where  $\rho$  is annual rent *on the whole parcel* and  $i$  is the rate of interest (Williams, 1997).

Now let  $V$  be equal to the current (depreciated) value of all existing improvements on the land. The aggregate acquisition cost of the land *and* its improvements will therefore be

$$C = L + V. \tag{3}$$

Suppose that the land and its existing improvements are destined for redevelopment. Let  $Y$  equal the cost of redevelopment operations. For present purposes,  $Y$  can range from the expense of simple renovation to the cost of wholesale clearance of the land and the erection of new built structures. We can take it that  $Y$  also includes carrying costs of the land between its initial acquisition and its resale. Accordingly, the total capital advanced to purchase and redevelop the land will be

$$K = C + Y = L + V + Y. \tag{4}$$

We will temporarily assume that redevelopment entails change in the quantity of physical output from the parcel, but no change in the nature of the output itself. Total annual output after redevelopment can be identified as  $x^* = x + \Delta x$  and its unit production cost as  $c^* = c + \Delta c$ , where  $\Delta x$  and  $\Delta c$  can take on either positive or negative values. Thus, we can have either increasing or decreasing production quantities combined with either increasing or decreasing costs as a result of redevelopment. Any given shift is equivalent to a switching of production techniques *à la* Sraffa (1960) with important implications for land rent.

In formal terms, redevelopment of the land is economically feasible only when the total rent generated on the converted parcel exceeds the total rent earned on the parcel in its original condition. The difference between these two quantities (assuming that the market price,  $\pi$ , remains unchanged) can be written as

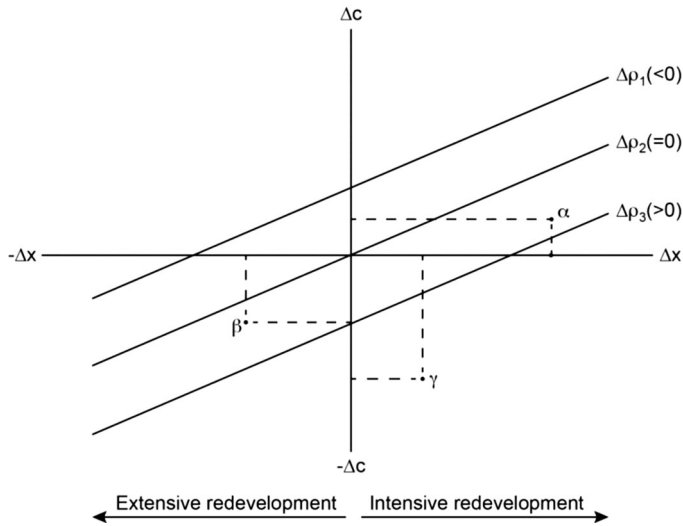
$$\Delta\rho = x^*(\pi - c^*) - x(\pi - c) = x^*r^* - xr \tag{5}$$

where  $r^*$  is rent per unit of output after redevelopment. As it happens,  $\Delta\rho$  is also the opportunity cost on redevelopment, and the developer has an incentive to proceed if this quantity is positive. Given that  $x^*$  and  $c^*$  must necessarily be estimated *ex ante* the decision to develop will always comprise a speculative element.

Equation (5) can be re-written in a way that explicitly identifies the relationship of  $\Delta\rho$  to  $\Delta x$  and  $\Delta c$ , i.e.,

$$\Delta\rho = (x + \Delta x)[\pi - (c + \Delta c)] - x(\pi - c) = \Delta x[\pi - (c + \Delta c)] - x\Delta c. \tag{6}$$

Consider Figure A1, which traces out three isolines,  $\Delta\rho_1$ ,  $\Delta\rho_2$ , and  $\Delta\rho_3$ , each of which represents a constant opportunity cost as a function of  $\Delta x$  and  $\Delta c$ . Note that  $\Delta\rho_1 < 0$ ,  $\Delta\rho_2 = 0$ , and  $\Delta\rho_3 > 0$ . Therefore any combination of  $\Delta x$  and  $\Delta c$  defining a point that lies above the isoline  $\Delta\rho_2$  yields an opportunity cost that is negative; and any combination defining a point that lies below yields



**Figure A1.** Opportunity costs on land redevelopment as a function  $\Delta x$  and  $\Delta c$ . The horizontal axis of the figure is defined by  $\Delta x$  and the vertical axis by  $\Delta c$ . The isolines  $\Delta\rho_1$ ,  $\Delta\rho_2$  and  $\Delta\rho_3$  represent different levels of opportunity cost. Note that  $\Delta\rho_1 < \Delta\rho_2 < \Delta\rho_3$ . Only points that lie below the isoline  $\Delta\rho_2$  yield positive opportunity costs; points lying above  $\Delta\rho_2$  yield negative opportunity costs.

an opportunity cost that is positive. The points  $\alpha$ ,  $\beta$  and  $\gamma$ , as shown in the figure all represent combinations of  $\Delta x$  and  $\Delta c$  that give positive opportunity costs and that represent viable redevelopment opportunities. Point  $\gamma$  identifies a situation where output increases and production cost declines after redevelopment, and in this case the incentive to redevelop is positive with respect to both  $\Delta x$  and  $\Delta c$ . Points  $\alpha$  and  $\beta$  represent more complex situations. In the case of point  $\alpha$ , total output from the parcel *increases* after redevelopment, but this advantage is partly offset by increases in production cost; in the case of point  $\beta$ , output *declines* but this is more than matched by a decline in cost.

These remarks now take us directly to issues of intensive and extensive land-use redevelopment. Whenever redevelopment of a given parcel results in  $x^* > x$ , land use per unit area becomes by definition more *intensive*, and where  $x^* < x$  land use becomes more *extensive* (with the proviso in each case that the feasibility of redevelopment presupposes that  $x^*r^*$  is greater than  $xr$ ). In both of these cases, the optimal form of redevelopment is given where the values of  $x^*$  and  $c^*$  are chosen to maximize the value of  $x^*r^*$ .

Intensive redevelopment and extensive redevelopment are in principle possible at any location in urban space. However, the more stringent conditions governing the economic feasibility of extensive redevelopment mean that it is almost certainly less likely to occur than intensive redevelopment. Further clarification of these issues turns on an analysis of the interaction between changes in output, production cost, and rent relative to intra-urban locations.

First, any feasible increase in total output via redevelopment at any given location—typically by building further upwards—will generate an increment to total rent per unit area. Provided that the value of  $c^*$  ( $= c + \Delta c$ ) can be kept within identifiable limits (so that the opportunity cost is positive) there will be an inducement to intensify land use at the same location. Given that land lying towards the center of the city virtually always commands high rents per unit of output in advance of any specific redevelopment action, intensification on this land is thus likely to be especially profitable to the developer.

Second, it is also possible in theory to pursue profitable redevelopment projects by means of a strategy that lowers both output per unit area and its production cost. In this case the new level of output will be  $x^* = x - \Delta x$ , and the new unit production cost will be  $c^* = c - \Delta c$ . The rent differential

or opportunity cost on redevelopment will again be given by [equation \(5\)](#), and, if this is positive, redevelopment will be cost-effective. In view of the fact that extensive land-use redevelopment entails *joint* reductions in output and unit cost, this is evidently apt to be a rather special case.

Once redevelopment of any parcel is complete, the market value of the land (i.e., the present value of all future land rents) will be

$$L^* = L + [(x + \Delta x)\Delta r + r\Delta x]/i = L + \Delta\rho/i = L + \Delta L. \quad (7)$$

The full market value of the parcel (land plus improvements), or its price to the next purchaser, is then determined by the original capital invested by the developer plus the current value of all future increments to annual rent yielded by redevelopment, namely,

$$K^* = K + \Delta L = L^* + V + Y. \quad (8)$$

The quantity  $L^*$  will be appropriated by the developer in the sale price of the improved parcel because its constituent elements ( $L$  and  $\Delta L$ ) are attributable to the land and the building, both of which are under the developer's control before resale takes place.

It is an easy matter now to generalize the analysis by allowing for land-use change to occur not only with respect to density but also to type of output. Variations in market prices due to changing volumes of output as redevelopment diffuses through the urban land nexus can at this stage also be entered into the analysis (See Scott, [1976](#)). As indicated in the main part of the paper, dynamic extensions of the model are possible.