

An indicator for decline of industrial estates

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This version 04-04-11

1. Introduction

The aim of this paper is to test an indicator that can represent the process of decline of a specific type of urban area: the industrial estate. We use data on decline derived from fieldwork on industrial estates in the Netherlands to test whether the development of property values on these industrial estates is a reliable indicator to measure decline. The identification of a reliable indicator enables the systematic analysis of processes of decline of industrial estates, which has received little attention in the vast body of literature on urban decline.

This paper comprises two parts. In the first part, a connection between urban decline literature with literature on the valuation of individual property is made. Urban decline at the level of individual urban areas, often referred to as neighbourhood decline or decay (Cheshire and Hay 1989) is much researched in urban literature. However, apart from inner city commercial areas, mostly residential neighbourhoods have been the topic of research in studies of urban area decline (see e.g. Broadway and Jesty (1998) and Medhurst and Lewis (1969)). Other parts of the city appear to be mostly neglected. Rather than adding to the already extensive literature on urban decline, the state of art on this literature is presented. Literature on the valuation of property is added to identify an indicator for decline of industrial estates.

The second, empirical part of this paper, focuses on fieldwork that was conducted in the Netherlands. A study of the present quality of more than 600 industrial estates in the South of the Netherlands will be compared to the development of property values on the same industrial estates. By bringing this together the hypothesis whether the development of average property values could serve as an indicator for decline of industrial estates, is tested. A proper indicator for decline of industrial estates is expected to be useful in at least two ways. First, this indicator will enable further analysis, seeking to explain why the decline of industrial estates (or other urban areas) takes place. Second, the majority of governmental redevelopment schemes (in the Netherlands and elsewhere) are aimed at the level of the urban area. More knowledge on the actual causes of urban area decline will help the responsible government organisations to better target revitalisation subsidies to obsolete urban areas in general and industrial estates in specific.

This paper is organised as follows. In section 2, obsolescence of urban areas will be defined and by studying property valuation literature, the factors that cause decline of industrial estates will be presented. This will lead to the conclusion that development of the average property value in a certain urban area can be an indicator for decline of that area. In section 3 the empirical work will be presented.

The present quality of the sample of industrial estates will be compared to the development of average property value. Section 4 draws the main conclusions and discusses their implications.

2. Urban decline: the influence of obsolescence

2.1 The state of the art

In the past two or three decades numerous studies have appeared on the process of urban decline and regeneration (for an overview see Couch et al. (2011)). Decentralisation of population and economic activities and deindustrialisation are generally considered to be important causes of urban decline (Cheshire and Hay 1989). The effects of these processes can be felt at different spatial levels ranging from regional level to individual areas within the city. Industrial estates are, like any other urban area, prone to decline. The majority of the aforementioned studies, however, analyse this process in a qualitative way. The few quantitative studies on urban decline seem to focus only on one particular city or urban area (Ellen and O'Regan 2008). Quantitative studies on what could be considered the opposite of decline, the process of gentrification, are less uncommon. Examples of these include, among others, Wyly and Hammel (1996; 1998), Atkinson (2000), Heidkamp and Lucas (2006) and Immergluck (2009). Proxies for urban decline that are used all have in common that they are derived from census data (See e.g. Guest 1974; Broadway and Jesty 1998; Galster et al. 2003). None of these studies however, has aimed at finding a single measurable indicator for urban decline. To find possible indicators that could be used to measure decline, we make a connection between two different fields of literature. First, we will elaborate literature on the obsolescence of property, e.g. Baum (1991; 1993), Mansfield and Pinder (2008), Dunse and Jones (2005) and Salway(1986). Second, we will connect this with literature from which causes and effects of urban decline are derived (e.g. Fogarty 1977; Galster et al. 2003; Ellen and O'Regan 2008).

Subsection 2.2 presents a short analysis of literature on property obsolescence and deterioration. The main issue addressed is which processes affect the development of property values. In subsection 2.3 it is argued that similar processes that influence the value of properties, also affect the decline of urban areas. Therefore, literature on urban decline is elaborated in subsection 2.4. This leads to the presentation of a quantitative indicator that can be used to measure decline of industrial estates.

2.2 Obsolescence of properties

The larger part of most urban areas is made up of real estate assets which represent a large invested capital: the built-space. One of the characteristics of this type of capital is that it undergoes a gradual loss in value (Bryson 1997). The loss in real existing use value of a property is known as depreciation (Baum 1989; Baum 1993) and is attributed to two negative processes: physical deterioration and building obsolescence (Mansfield 2000). Mansfield (2000) criticises existing literature in its capacity of clearly defining physical deterioration and obsolescence: *“Despite a considerable body of literature, there still appears to be a misunderstanding in the use and precision of some fundamental terms”* (Mansfield 2000:2). The differences between obsolescence and physical deterioration have been described by many authors (see e.g. Nutt et al. 1976; Salway 1986; Baum 1991; Baum 1993; Bryson 1997; Mansfield 2000; Mansfield and Pinder 2008). The debate appears to be focused on obsolescence, since physical deterioration seems to be defined more unambiguously. Most authors distinguish between obsolescence and deterioration acknowledging that these are two different factors that influence the value of a property. Lichfield (1988) however regards physical or structural deterioration as an element of obsolescence. Mansfield (2000) and Mansfield and Pinder (2008) argue that some authors falsely use the term ‘physical obsolescence’ when actually referring to a process of physical deterioration. An important distinction between obsolescence and physical deterioration is proposed by Dunse and Jones (2005): *“a key distinction between physical deterioration and obsolescence is that the latter is outside the control of property owners”* (Dunse and Jones 2005:206). Physical deterioration, in the remainder of this paper referred to simply as deterioration, is defined as *“an absolute decline in utility resulting from usage, wear and tear and the action of the elements”* (Baum 1991 in; Mansfield and Pinder 2008:196). This defines deterioration, but still leaves unexplained what is obsolescence.

Start describing obsolescence from work by Salway, incorporate Nutt and Sears. Distinguish between obsolescence caused by factors on the supply side and factors on the demand side. How to treat the term ‘functional obsolescence’? Alter the taxonomy of obsolescence when applied to urban areas. This section only discussed the many different studies and forms of **building** obsolescence. Stress building probably.

Mansfield (2000) argues that the nature and scope of obsolescence is wide and hence ill defined: *“the scope of obsolescence is wide, embracing factors that relate to the structures themselves, the particular site the property occupies and its surrounding area, the statutory and regulatory framework and more subjective, aesthetic issues (...) it is unsurprising that the literature has reached no real consensus on its*

definitions” (Mansfield 2000:1). Salway (1986) distinguishes between different types of obsolescence and uses an early definition of obsolescence by Baxter (1971): *“value decline that is not caused by use or the passage of time”* (Salway 1986:?). In addition to this definition it can be noted that *“obsolescence results from change that is extraneous to the asset – the asset may remain as good as ever in itself, but be rendered obsolete by external factors (...)”* (Salway 1986, in; Mansfield 2000). Some of these external factors probably coincide with the factors believed to result in obsolescence according to Mansfield, quoted above. Mansfield and Pinder (2008) critically review different studies on obsolescence, identifying two main forms: economic and functional obsolescence. Baum (1991) uses the categorisation by Salway (1986) to distinguish between aesthetic, functional, legal and social obsolescence, which he then further classifies under either functional or aesthetic obsolescence. The former contains the subsets of social and legal obsolescence and is caused by changing occupiers’ requirements. The latter is defined as *“obsolescence resulting from outdated appearance”* (Baum 1991:65). Dunse and Jones (2005) use the definition of economic obsolescence by Salway: decreasing property values caused by underlying market conditions independent of the state of the structure itself. Wurtzebach and Miles (1984) claim that an alternative term for economic obsolescence is locational obsolescence. Locational obsolescence in their opinion is considered the loss in value due to factors external to the property. We agree with Mansfield and Pinder (2008) and Baum (1991) that this division does not clarify the discussion. The same goes for the distinction of environmental and structural obsolescence by Dunse and Jones respectively Golton (1989).

Nutt and Sears (1971) in an earlier overview conclude that existing studies on obsolescence have many different viewpoints and *“Whichever of these viewpoints is adopted, and they do overlap considerably, the process and consequences of functional obsolescence will depend on changes of a social, physical, environmental and economic kind”* (Nutt and Sears 1971:14). Obsolescence by Nutt and Sears is regarded as a function of two systems: a behavioural system and the physical environment in which a building resides. Essentially these can be considered functions of demand and supply. The behavioural, or social, system reflects (potential) occupiers’ demands. Changing viewpoints, whether these are aesthetic, social or legal, will change the preferences (potential) occupiers have and thus the demand for existing property, thereby influencing its value. On the other hand, the changing environment will result in new supply of property and existing property will face the process of obsolescence .

The broad discussion in literature could be summed up as follows: depreciation of property comprises:

- Physical deterioration;
- Obsolescence of property, consisting of:
 - o Supply-side obsolescence: caused by changes in the physical environment
 - o Demand-side obsolescence: caused by changing societal/behavioural system

We will apply these concepts to obsolescence at the level of the urban area. Therefore we will study which changes in the behavioural system and the physical environment are believed to influence the value of property. There are many authors who argue that factors in the physical environment can influence its value. This is included in many studies that use hedonic price models such as the work of Ryan (2005), Tse (2002) and Khalid (1992). Authors that have focused on industrial and commercial property also incorporate a wide variety of environmental factors in their analyses of these property's prices (see e.g. Ambrose (1990), Fehribach et al. (1993) and Lockwood and Rutherford (1996)). Bryson (1997) argues that urban areas itself can also devalue. We assume that the value of an urban area can be represented by the aggregate of all individual properties. Until now, we have focused only on the factors and processes that influence the value of individual property. In the next section, factors that influence the value of urban areas will be introduced.

2.3 Obsolescence of urban areas

In the previous section, two distinct processes that influence property value were introduced. We argue that the urban area suffers from similar processes and although deterioration also occurs, only obsolescence is taken into account here for reasons further explained in section 2.4. Until this point, obsolescence has only been regarded as a process that influences the value of individual properties. As was mentioned in the introduction, urban policies such as redevelopment programmes for neighbourhoods and inner cities are mostly targeted at urban areas. And although policies aim at affecting processes of decline at this level, there seems to be a gap in the knowledge as to what processes actually take place. To start filling this void this section will make the connection between urban area decline and obsolescence.

Bryson (1997) argues that devaluation of urban areas can be considered one of the causes of locational obsolescence (see above). And although he does not go into detail on what he actually regards as locational obsolescence, he does consider an opposite process. The value of an urban area can also increase and this can occur by reinvestments, notably via gentrification or via investments in

infrastructure (Bryson 1997). Such changing market conditions however can also lead to a decrease in the attractiveness of the area. Shops closing down in a residential neighbourhood can make the area less attractive to live in. And a new out-of-town shopping centre may result in less visitors for the inner city shopping area thereby causing shops to close down. The resulting decline in value is similar to what happens when the value of individual property is influenced by obsolescence.

Changing conditions of an urban area can be considered the first factor that causes obsolescence of urban areas. Some urban areas however suffer from a decline in attractiveness without the conditions changing. This illustrates that it is not only the changing conditions of the urban area that can influence the valuation of urban areas. The conditions of a particular urban area are interpreted by people who live there or visit the area. This leads to the second type of factors causing obsolescence at the level of the urban area: the changing location requirements by users and occupiers, both present and potential (from here: user demands). This is best illustrated by making a comparison with a type of building obsolescence that was elaborated in the previous section. Individual buildings can suffer from functional obsolescence. This type of obsolescence can be regarded as driven by changing technical, aesthetic or social requirements. Obsolescence at the level of the urban area can also be caused by a more or less comparable process. As time progresses, the demands of (potential) occupants or users of an area are subject to change. For industrial areas within the city, perhaps one of the most important changes affecting the attractiveness of those areas has been occupiers' demands regarding accessibility alongside with the introduction of stricter regulation with respect to noise, safety, pollution, etc. in residential areas. Factories and other heavy industries have for a long time relied on transport via canals and railways. Nowadays, road accessibility is usually a more important location factor for occupiers of industrial estates. Industrial areas that were located near railway stations (often near the city centre) became outdated rapidly after the growing importance and expansion of the road network (Chapman and Walker 1991:41). Residential neighbourhoods are subject to changing demands by their residents as well. A typical example of this is suburbanisation driving residents out of large cities to smaller settlements at the outskirts of the city. Changing user demands can be regarded as the second factor that causes obsolescence at the level of the urban area.

Urban decline is partly caused by urban area-obsolescence: a reduction in attractiveness of an urban area, caused by two main factors: changing conditions of an urban area and changing user demands of urban areas. The latter have to be taken into account when the decline of an industrial

estate is measured. We argue that deterioration, in relative terms and compared to other types of urban areas, does not play a significant role in the process of decline of industrial estates¹.

Decline of industrial estates has to be assessed for this study. Two basic assumptions are taken into account. First, the factors that should be addressed when measuring decline have to be selected. Based on a report of the Netherlands Bureau for Economic Policy Analysis, the following four factors are distinguished between: appearance, accessibility, environmental issues and efficient use of space (see: Schuur 2001). However, decline of industrial estates can only be measured if also the requirements of the users are taken into account. Users of an office park have different standards concerning the appearance of the estate than users of industrial estates that are dominated by heavy manufacturing. The same goes for accessibility if one compares a company from the logistics service sector with users of other industrial estates. The scores that are measured for the before mentioned factors should be adjusted for the requirements of the users of an estate. In order to do this, a distinction between five types of industrial estates was made: functional, modern, high-quality, logistics and heavy manufacturing estates. In section 3, the outcomes of the study in which decline was measured on a sample of more than 500 industrial estates will be presented.

2.4 An indicator for decline of industrial estates

The previous sections elaborated the process of urban decline and the role of obsolescence within that process. Deterioration was not taken into account. The reason for this is that we focus on industrial estates: we argue that deterioration does not play a major role in the process of decline of industrial estates. Although general consensus in the Netherlands seems to be that deterioration explains the decline of industrial estates for a substantial part, this view fails to explain why a fair share of relatively new (not older than 10-15 years) industrial estates also face the process of decline². This period seems to be too short to allow for deterioration to have had a significant influence on the decline of an industrial estate. Furthermore, research shows that relatively new industrial estates already go through

¹ Note that a similar line of argument seems to be valid for a growing number of office parks as well. In the Netherlands, the lack of a restrictive spatial policy for those sectors seems to be part of the explanation. The separation of ownership and use is another explanation, as well as the relative small share of the cost of investing in new buildings as a share of a company's total investment costs. All this makes it relatively easy for companies to move to other locations as opposed to investing in their current location.

² A study by the Netherlands Environmental Assessment Agency shows that of industrial estates not older than 6 years, 3% faces decline. Of all industrial estates aged between 6 en 10 years this percentage is already 11% (Planbureau voor de Leefomgeving 2009:53)

redevelopment (Ploegmakers, forthcoming). We therefore argue that obsolescence, the second process that influences decline, for a substantial part accounts for the decline of industrial estates.

To find an indicator for decline of industrial estates, we turn to studies on urban decline and gentrification. Considering present studies on urban decline, most authors seem to conceive urban decline as a process with causes and effects that are related to the socio-economic circumstances of places (whether this is a region, city or urban area) and its residents. Obsolescence could well be influenced by some of the same factors. Factors that are believed to influence decline of neighbourhoods include among others 'the actions of socio-spatial agents' (Aalbers 2006), family breakdown (Wallace 2001) and, mostly in American studies, non-white population (see e.g. Fogarty 1977; Galster et al. 2003; Ellen and O'Regan 2008). Proxies for urban area decline derived from census data include socio-economic status derived from years of education of the inhabitants (Haggerty 1971), poverty of inhabitants (Galster et al. 2003) average household income (Ellen and O'Regan 2008) and unemployment figures (Broadway and Jesty 1998). Considering these phenomena Lang's statement: "[u]rban decline is a social problem" (Lang 2005:2) makes sense. The problems causing decline of industrial estates however are less related to the social circumstances, but much more to economic and functional motivations of the occupiers (see footnote 1). It should be taken into account that not all of the 'classical' phenomena used in most studies on urban decline are applicable as we look for an indicator for decline of industrial estates.

Literature on what could be considered the opposite process of decline, gentrification, takes into account not only similar socio-economic phenomena such as the ones mentioned above (Ley 1986; Butler and Robson 2001; Immergluck 2009) but economic variables, such as income and property values, as well. Smith and Williams (1986) define gentrification as: "*the rehabilitation of working-class and derelict housing and the consequent transformation of an area into a middle-class neighbourhood*" (Smith and Williams 1986; quoted in: Atkinson 2000:149). Walks and Maaranen (2008) argue that one of the effects of gentrification is "*increasing and more stable property values*" (Walks and Maaranen 2008: 297). From the quoted definition above, one could also derive a second important effect of decline: a change of the mean income of the neighbourhoods' residents. Both of these effects come together in the definition of gentrification by Torrens and Nara (2007): "*Gentrification refers to the transition of property markets from relatively low value platforms to higher value platforms under the influence of redevelopment and influx of higher-income residents (...)*" (Torrens and Nara 2007:337). Although property (markets) appear to play an important role in the process of gentrification, studies on urban

decline seem to largely ignore the role of property and property markets when it comes to quantitative analyses of urban decline.

Both studies on urban decline and gentrification have focused mainly on residential neighbourhoods. This paper is aimed at finding an indicator for decline of industrial estates. Some of the factors used in the studies mentioned above could also be used as indicators of decline on industrial estates. First, the economic output of companies on industrial estates could be regarded as the equivalent of household income. Second, property value seems to be a useful indicator for decline on industrial estates as well. We argue that these key effects of gentrification and neighbourhood decline could also serve as indicators of urban area decline when it comes to decline of industrial estates. Unfortunately, the availability of data on economic output is data is neither available at the level of individual companies, nor at the level of individual industrial estates³. Data on the value of properties however is readily available⁴. We will propose therefore to use the development of property value as the indicator for decline of industrial estates.

3. Data – Forthcoming

³ An examples of a study in the Netherlands that has used economic output of companies at the regional level is Louw, van der Krabben en van Amsterdam (forthcoming).

⁴ In the Netherlands, all properties are valued every year for taxation purposes under the so-called *Wet Onroerende Zaken* (Real Property Act).

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