

Creating a sustainable local housing market – part II: some diagnostic issues

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Introduction

The housing bubble, and its consequence, *the credit crunch* are familiar terms now. The underlying reason is said to be an unsustainable property/housing market. Unsustainable means ‘not sustainable’. What then would be a ‘sustainable market’? Market is an economic concept, and pertains to a process where the driving goals of its participants are in one way or another aimed at reaping a profit as a producer or intermediary, or maximizing economic utility as a consumer. Profit (and indeed utility), however, refers to a short-term gain; furthermore, it is relatively one-dimensional, even if there are schools of thought that do not refer to ‘maximising’ but merely ‘satisficing’ strategies (notably, Thorstein Veblen’s institutionalism and Herbert Simon’s behaviouralism). These are in fact the key differences to the concept of ‘sustainable market’: its goals are defined as long-term and multidimensional (Kauko, 2008a). Sustainability is multidimensional even if we are restricted to only the economic dimension. In a prior presentation for ERSA Liverpool 2008 (Kauko, 2008b) I touched upon these issues and the present paper documents further progress in this project. While this evidence is based on anecdotes only, some cautious speculation is in order. The overview of the current paper is as follows: (1) further argumentation in relation to sustainable real estate; (2) design of methodology; (3) summary.

Lessons learnt so far...

Based on desk research and roundtable discussions it was established that strategies for creating a sustainable market ought to be based on the following principles:

- The immediate aims likely to be ‘bottom-up’ (as opposed to top-down).
- To convince investors, developers and homebuyers about sustainable market strategies.
- A role for government in stimulating conversions, refurbishments and new developments into sustainable modes.
- ‘Elitist view’ or ‘Cynical view’? Two strategies for creating sustainable real estate locations can be outlined as follows:
 - (1) *elitist*: behaviour of actors and government stimuli¹
 - (2) *cynics*: government regulation and laws.
- Sustainability incentives such as taxes would be in between ‘Elitists’ and ‘Cynicists’.

¹ A colleague of mine calls the elitist stance ‘naïve’.

- This is not only about the role of the buildings, but also about the role of the location and neighbourhood!

The individual property asset based rating is a relatively new instrument, the cutting edge development and application taking place in the German speaking Europe and to some extent already in UK. In any case, there is a need for trans-disciplinarity.

Hobson (2008) argues that ‘ethics’ and ‘participating’ provide important views for developing the sustainability discourse. True that ‘climate change is as much about ethics and justice as it is about sound social science, sustainable economic growth and technological fixes’, as she claims (p. 199), but can it really be that ‘being cheerful’ is a relevant concept to conduct research, as she also claims? In any case it should be agreeable in general that knowledge generated outside academia should be recognised and given credit too.

Visiting EXPO Real 2008 in Munich – an essentially non-academic event of gargantuan proportions – gave me the picture that the ideas of sustainable real estate are much better accepted and developed in business than in academia! Furthermore, sustainability always is a local issue; and importantly, metrics of sustainability is a critical issue for investors. The panellists stressed the need to adjust the sustainability in relation to the market. A big discovery (from EXPO Munich 2008) was that the real innovative guys can be the private sector property investors rather than academics – even in *sustainable urban development* and beyond! For an academic it is therefore a good experience to meet people and see things that are different from the normal forums and meetings where one participate.

Among the benefits of attending such meetings are the possibilities to learn about various private investment and city marketing perspectives applied in practice. This is true; presentation of very up-to-date statistics and case-studies, including urban renewal and housing market information on various circumstances (including CEE circumstances). Based on this experience it is safe to assume that the ideas of sustainable real estate are much better accepted and developed in business than in academia! (See www.rics.org on refurbishment strategies.)

An example of such borderline between practice and research concerns the issue of active vs. passive sustainable developments. According to the panellists (Paul Appleby, Peter Höpfe, David Lawrence and Mark Faithful) the problem is that the owner does not benefit of energy efficiency. Therefore, in Germany an energy passport (daylight, floor-tiles etc.) is required of each house by law. Unfortunately the practice in the US is not the same as in EU. For example, in Hungary a developer-owner is cutting energy costs by 50-60%; however, the problem is the risk involved in ‘being creative’. How to oblige investors to teach better engineers? (This is the ‘active’ sustainability school.) As a contrast, the so called ‘passive schemes’ – the ones which are connected to main networks – fit the bigger picture.

According to Judi Seebus and other panellists, sustainability always is a local issue; to establish a metrics of sustainability is a critical issue for investors. Jens Friedmann and other panellists stressed the need to adjust the sustainability in relation to the market. Furthermore, if minimum return is reaped, then one might prefer to invest in sustainable, but more expensive buildings. They also conclude that it is – now that we are in the midst of crisis – perhaps time for opportunities. How should then sustainability be treated in relation to the financial crisis? Firstly, it is ‘a walk in the park’ in comparison with the global climate change; secondly, as it is time to take stock and learn from the financial crisis, assets with

energy certificate might become more widespread, these experts assert.

The interesting notion is that most straight business people are convinced about sustainability as a criterion of investment and fully believe in the concept of *sustainable real estate*. To some extent professional organisations such as RICS are too. But the disappointing and frightening thing is that so many academics are not convinced.

In an attempt to reinforce our belief in public policy, environmental economist Bromley (2007) discusses market failure – a defining concept in the environmental economics paradigm – in designing sustainable environmental policy. Here are a number of interesting arguments, some of which seem reasonable and innovative and others rather doubtful and even downright erroneous. He argues that ‘sustainability concerns the creation of dynamic human processes’. Bromley acknowledges the key point of all sustainability arguments: ‘..the entire process of environmental policy is to make sure that future persons do not acquire the “wrong” preferences.’ Furthermore, his claim that ‘models of optimality bring nothing compelling and necessary to the realm of human action’ is also correct. Some of his arguments are debatable however. What he fails to note is that the sustainability goal also incorporates non monetary costs. Then he mocks ‘scientific approaches’ and objective measurement of sustainability, which to me is rather misguided and cynical even. Finally, he suggests that sustainability is a democratic concept – this is something I disagree with, because professionals tend to know better problem solutions than lay people. His arguments are of course presented within a ‘relativist’ perspective. In my view having democratic policies, Pareto optimal or not, are seldom sustainable simply because designing any policies is lagging behind the actual social and market based processes.

What seems a more agreeable proposition is to recognise that unsustainable real estate practices are based on too high expectations of profit (e.g. Wallace, 2008). A theoretical case can be made for two types of price setting situations: one based on a real effect of the housing market where the price changes with time and another one based on a spurious effect where only the stock changes but price per unit does not change (Prasad and Richards, 2008).

Sustainable property investment strategies may be connected to a property rating system that focuses on the property to be financed rather than the credit standing of the borrower. The individual property asset based rating is a relatively new instrument, the cutting edge development and application taking place in the German speaking Europe and to some extent already in UK. Their benefit is argued to be their ability to create opportunity and risk profiles of property assets. Due to their treatment of ‘unsustainability’ as additional risk element these rating systems can offer guidance about sustainability for banks and investors. As a consequence of such communication, a market transformation of the construction and property sectors will occur. However, the challenge is to harness property values and the financial instruments to reflect the true market value of sustainable buildings – to demonstrate how such buildings perform under existing valuation and risk analysis methods. Moreover, social, psychological and health effects related to the surrounding environment, for instance, good landscape aesthetics and planting trees, or waterfront developments, will also be taken into consideration in such a methodology. More research is however yet needed on many of these issues, such as on the relationships between technical, functional, environmental and social performance and the economic effects. (RICS, 2007)

A methodology for empirical analyses

A 'more academic tradition' targets associations and correlations between property price and other physical, social-economic and environmental (and sometimes institutional and behavioural) variables. Through the hedonic price/market modelling concept that was developed in the late 60s to early 70s, and then from the late 70s onwards through the segmentation/submarket concept (e.g. Maclennan, 1977; Grigsby et al., 1987). On the other hand, a 'more practical tradition' that is preoccupied with improving the modelling performance for mass appraisal purposes (see Lentz and Wang, 1998; and Kauko, 2004). However, various academic empirical traditions could benefit from sophisticated value modelling tools when applied as a guideline for which market model is valid and feasible for a given dataset with certain recognisable tendencies.

In this project the aim is to classify the citywide residential property market (or the owner occupied segment thereof). In the long term, the market can be classified as sustainable or unsustainable, and this is not the same as classifying it as efficient or inefficient (although the two dimensions may overlap). From the concept of market sustainability we can then deduce the premises for value sustainability: a sustainable market generates sustainable value, which then can be used as an attractiveness indicator in a broader sense; or in the opposite case, an unsustainable market diagnoses a problem – an unsustainable value. This general model of the market place will subsequently be subject to empirical verification using various sophisticated modelling techniques, such as the *self-organising map (SOM, Kohonen Map)* and its extension the *learning vector quantization (LVQ)* classifier, on how data on the long-term development of prices and the quality of the residential environment (or a more general indicator, quality-of-life) are related to each other.

In this follow up to Kauko (2008a,b), the main question to answer is *Where?* The dataset on Amsterdam 1986-2002 is utilised as follows: Each observation is labelled into three ordinal categories with respect to all three variables: price related to dwelling quality, price related to maintenance and price related to quality of micro-location. The first stage will be to show descriptive time-trends for all three P/Q variables (see fig. 1 and fig. 2).

The next procedure is to generate SOM outputs for each cross section. We also need to calibrate each SOM output with the P/Q indicator as label. Here the three citywide aggregate P/Q indicators for quality are reduced into one (simply by taking the mean); then this indicator will be rounded into three ordinal categories for labelling. Finally, we apply the LVQ classification using this labelling as classification criterion. We can also compare with other classification criteria, but the main thing here is that we compare across the one-year cross sections. This time only the LVQ results (not the SOM results) are reported.

For the labelling with the best classification result the distinction between sustainable and unsustainable locations must then be assumed to be important. We define the following based on earlier theoretical propositions (see Kauko, 2008a). If the P/Q indicator is below a lower pre-specified threshold, the case is sustainable in non economic terms; if this indicator is above the lower threshold but below an upper pre-specified threshold, the case is economically sustainable; and if this indicator is above the upper threshold it is totally unsustainable. A label will be assigned as follows: 0 for non economic sustainability ($P < Q$); 1 for economic sustainability ($P = Q$); 2 for total unsustainability ($P > Q$).

When classification runs are carried out systematically for each cross section, we get a formal measure of the strength of discrimination of each of the three classes as well as an average measure of the whole cross section. We furthermore obtain a time-trend as to which of the

three classes is increasing or decreasing its influence as discriminant of the classification, as well as how the average classification for the whole sample develops through time.

Fig. 1 shows that the upper graph has an index of more than double that of the lower, which means – given our definitions – that the lower market development only is sustainable (or at least more economically sustainable than the upper situation). It is, however, to observe that this diagrammatic illustration only concerns the economic dimension(s). In fact, the Geuzeveld-Slotermeer district – a typical Dutch unfashionable garden city milieu – has lots of social problems. In fig 2. two turning points are to note in the lower graphs: around 1991 and 2001 respectively, when the P/Q ratio turns more sustainable. Fig. 3 illustrates the functioning of the SOM and LVQ techniques. First we generate the SOM output. Then we classify it with LVQ based on how we have labelled the input (observations) and the response from the SOM output. The result is a percentage correct classification of the whole sample + for each category separately. We repeat these procedures for each year so as to obtain a time trend.

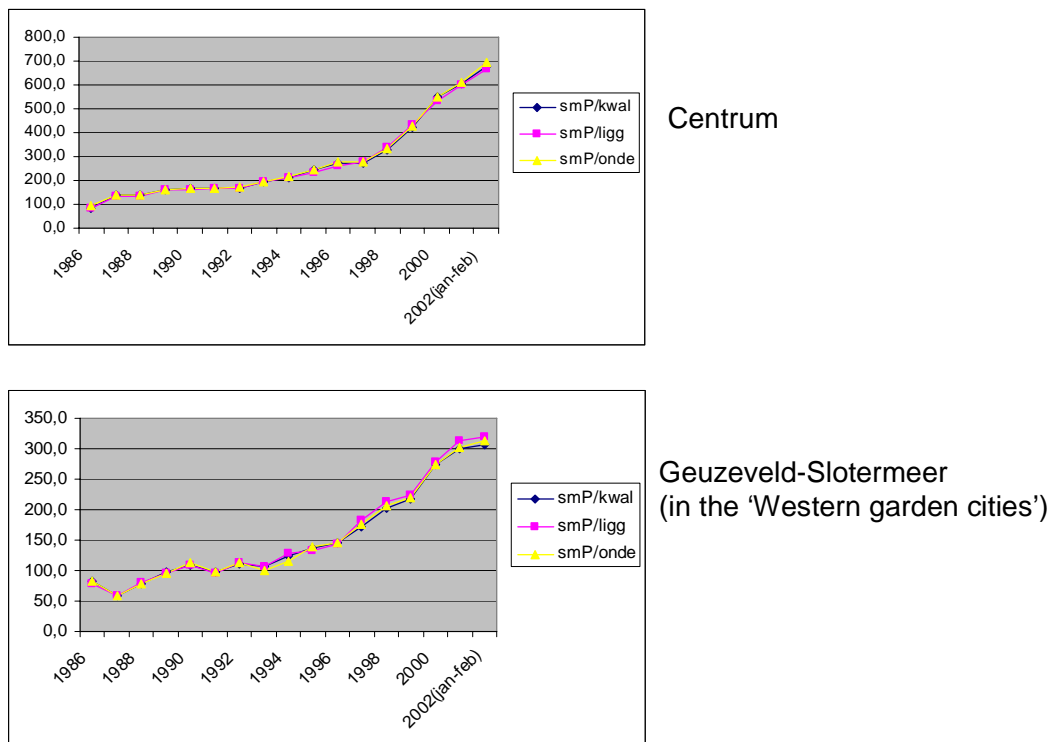
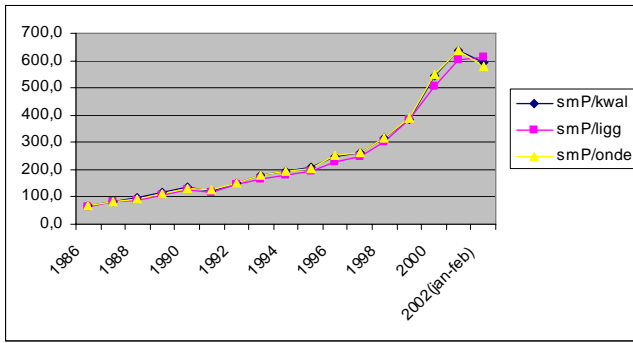
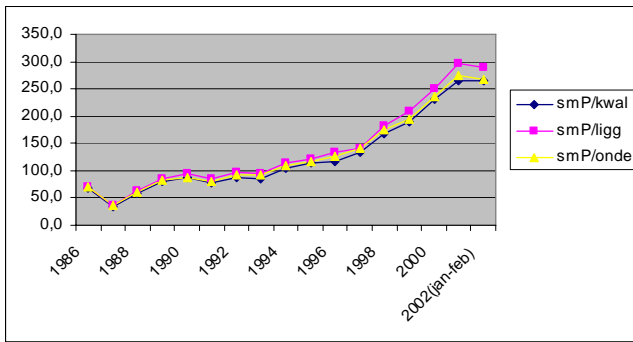


Fig 1. House prices in relation to quality in two districts of Amsterdam.



Oud-west (old-west, in the southwestern part of the outer inner city)



Zuidoost (southeast, annexed suburban area)

Fig. 2. House prices in relation to quality in two districts of Amsterdam.

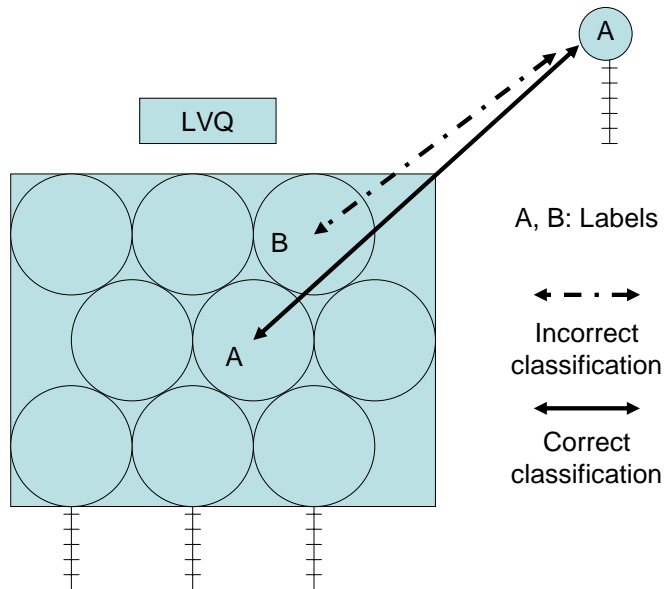


Fig. 3. The principle of the LVQ classification of the dataset.

Summary

Apparently the ideas of sustainable real estate are much better accepted and developed in business than in academia. Furthermore sustainability always is a local issue. Here a metrics of sustainability (in relation to the market) is a critical issue for investors. Sustainable property investment strategies may be connected to a property rating system that focuses on the property to be financed rather than the credit standing of the borrower. Social, psychological and health effects related to the surrounding environment also have to be taken into consideration. However, more research is yet needed on this topic, considering its importance in social-economic terms.

High theorists like Bromley (2007) have a belief in democratic public policy within this realm, and therefore consider sustainability a relative and rather subjective concept, thereby supporting the public policy and government regulation based 'route' to sustainability practices! This seems questionable given the historically poor capability to adapt of any hierarchical systems of provision. On the other hand, if an elitist stance is taken, the role of the market place takes the centre stage. Consequently, the role of micro-level data analysis is strong: the price in relation to quality (or affordability). This way it is possible to distinguish between trends that are completely 'sustainable', 'economically sustainable' or 'unsustainable'.

The aim of the empirical part is to classify the citywide residential property market based on price/quality. The assumption is that *a sustainable market* generates an attractiveness indicator in a broader sense; or in the opposite case, *an unsustainable market* diagnoses a problem. The dataset comprises transactions of dwellings from Amsterdam 1986-2002, with sales prices and a number of attributes incl. subjective environmental and housing quality as input variables (property descriptors). First a descriptive time-series is shown as a simple diagram; subsequently sophisticated classification analysis is conducted.

The method in the ongoing Amsterdam analysis of P/Q ratios can be summarized as follows:

- We define the following three classes of sustainability:
 - if the P/Q indicator is below a lower pre-specified threshold, the case is sustainable in non economic terms
 - if this indicator is above the lower threshold but below an upper pre-specified threshold, the case is economically sustainable
 - if this indicator is above the upper threshold it is totally unsustainable.
- When LVQ classification runs are carried out systematically for each cross section (during the period 1986-2002), we get
 - comparison of the strength of discrimination for each of the three classes and an average for the whole cross section
 - a time-trend as to which of the three classes is increasing or decreasing its influence as well as how the average classification for the whole sample develops through time.

Here is plenty of scope for further work in relation to economic and other sustainability classification/analysis of different areas, property types and particular indicators/criteria applied.

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