Institut für Regional- und Umweltwirtschaft
Institute for the Environment and Regional Development

Sabine Sedlacek, Gunther Maier

Green Building Councils: Their Economic Role as Governance Institutions

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Sabine Sedlacek[a,*], Gunther Maier[b]

[a]*MODUL University Vienna, Am Kahlenberg 1, 1190 Vienna, Austria, email: sabine.sedlacek@modul.ac.at; tel: +43-1-320 3555-601; fax: +43-1-320 3555-903*
[b]*WU, Vienna University of Economics and Business, Augasse 2-6, 1090 Vienna, Austria, email: gunther.maier@wu.ac.at; tel: +43-1-31336-4780; fax: +43-1-31336-705*

Abstract

Green Building Councils (GBCs) have been established in many different countries in recent years. This paper discusses the role such organizations can play in the respective construction and real estate industry and under what circumstances a GBC can contribute positively to the development of a "greener" or "more sustainable" stock of buildings. The paper investigates the main informational problem of the industry by looking at the relation between a developer and an investor from an economic point of view. We argue that the investor's uncertainty about the true quality of a building and the corresponding incentive for the developer to cheat may lock them into a prisoners' dilemma trap. The corresponding barriers for a transition toward a "greener" buildings market are analyzed. GBCs are described as institutions of economic governance that can assist the economy in overcoming these problems. They can act as third party institutions in transactions between developers and investors. By certifying the quality of a building, they can reduce the risk for the investor to be cheated by the developer and also increase the incentive to develop good quality buildings for the developer. This task, however, raises some severe management challenges for the GBCs.

Keywords: green building councils, circle of blame, prisoners' dilemma, economic governance, certification

1. Introduction

Greening the construction industry has become big business recently. Organizations devoted to promote Green Buildings, Sustainable Buildings and such are popping up in different parts of the world. As of early 2012, the World

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[*]corresponding author

Email addresses: `sabine.sedlacek@modul.ac.at` (Sabine Sedlacek), `gunther.maier@wu.ac.at` (Gunther Maier)

Green Building Council, a NGO located in Toronto, Canada, lists 88 organizations worldwide in their "Green Building Councils Directory", 30 of them in Europe. This development is relatively recent, as the breakdown of these organizations by organizational status shows: About one fourth of them (27.27%, 24 councils) have achieved the highest organizational status, "Established GBC", 10 GBCs (11.36%) fall into the second category of "Emerging GBC", 31 GBCs (35.23%) have the status of a "Prospective GBC" and one fourth (23 organizations, 26.14%) fall into the category of an "Interest Group", supposedly hoping to advance to a higher level of status soon.

A survey of member organizations of the World Green Building Council, the main results of which are reported in the appendix, shows that they pursue a wide range of objectives by using a similarly disperse set of activities (for details see the appendix). Since they all share the mission to "facilitate the global transformation of the building industry towards sustainability through market driven mechanisms" (WGBC mission), this diversity between the organizations raises a number of questions: (1) what role can market mechanisms play in the transformation of the building industry toward sustainability; (2) which market mechanisms are critical for this transformation, and (3) are Green Building Councils[1] in the position to implement these mechanisms. We will deal with these – theoretical – questions in this paper.

As we can see from the survey reported in the appendix, the activities of Green Building Councils (GBCs) can broadly be categorized into three areas:

1. Promotion of sustainable construction and building awareness of the issues of sustainability;
2. Lobbying for building codes and policies that support sustainable buildings and sustainable development in general;
3. Identify best practice examples through the application of sustainable building rating systems

The *first area* targets the general public. The GBCs aim to alter behavior by providing information about issues of sustainability and about sustainable materials and construction techniques. The underlying assumption of this approach is that information is the main bottleneck in the transition to sustainable buildings and construction. Everyone would like to make this transition; they just do not know how to do it. The *second area* takes on the opposite position. It assumes that sustainable buildings can only be implemented through governmental regulation. Unless a public policy body requests these standards in building codes they will not be implemented. This position actually conflicts

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[1]Although one could discuss the appropriateness and validity of this term at length, in this paper we will use the term "Green Building Council" (GBC) for all organizations that aim to facilitate the transition of the building industry toward sustainability irrespective of membership in the World Green Building Council or any other organization. The reason is simply a practical one: the term is well established in the respective policy discussion and is used by the World Green Building Council and most of its members when referring to these organizations.

with the above mentioned concentration of the WGBC on "market driven mechanisms". The *third area* takes on an intermediate position. It encompasses more than just general information, but less than mandatory regulations for everyone. This area attempts to identify particularly good examples of sustainable buildings by measuring them against the yardstick of a sustainable building rating system. This measurement is voluntary and usually paid for by the building developer. This approach combines two policy elements: on the one hand it implicitly informs the general public about sustainable buildings and sustainable construction techniques, on the other hand it identifies individual buildings to be of particular quality with respect to sustainability.

The sustainable building rating systems are of particular importance in our context. Since the launch of the Building Research Establishment Environmental Assessment Method (BREEAM) in the UK in 1990, numerous organizations worldwide have developed and implemented sustainable building rating systems. The World Green Building Council lists nine of them on its homepage, from "Green Star" in Australia, New Zealand and South Africa, via CASBEE in Japan, LEED in the US and Canada, to BREEAM and DGNB in Europe. For literature comparing some of those systems see Gowri (2004), Fowler and Rauch (2006), and Smith et al. (2006). Smith and Fischlein (2010) discuss the relation between rival standards.

Although they differ in how they assess buildings and what standards they apply, most systems apply a very similar procedure: When a building is proposed for assessment, a certified assessor evaluates its planned or actual performance based on the rating system. He or she then submits the result of the assessment to the respective certifying organization which validates the assessment in a peer-review type procedure and – if successful – awards the certificate. From the point of view of GBCs important questions are how closely they are related to these rating systems and whether or not they can act as a certifying organization. The largest rating system, LEED, is operated by the US-Green Building Council, the German DGNB system by the German GBC. Most systems, however, are also applied in other countries as well.

GBCs are non-governmental organizations (NGOs) and are therefore typically engaged in voluntary activities. Therefore, most of them dependent on the support from private industry in the form of sponsorship and membership fees rather than governmental support. This makes them particularly interesting from the point of view of governance. On the other hand, this position also raises the question of how sustainable these organizations are themselves. Are they viable policy instruments in the long run because they fulfill a valuable function in this arena of economic policy or is it more likely that they just fashionable at the moment and will soon disappear because they do not serve any valuable function?

This paper will also help answer this question as a by-product of the main research questions that were mentioned above. In order to answer them, we will have to analyze what economic function GBCs can fulfill. We apply economic theory to tackle this issue. In the next section we will try to identify the problem that GBCs may solve. There, we offer two alternative views, a conventional

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one and an economic one, which not only lead to different interpretations of the roles of GBCs, but also have implications for their strategy and portfolio of activities. In section 3 we try to embed these organizations into the literature on economic governance in order to link this specific case to the broader conceptual framework. The paper closes with a concluding section that will derive some expectations about the future role and development of GBCs from the theoretical discussions of the paper.

2. Where is the Problem for GBCs to Solve?

When we want to answer the question of why GBCs exist and whether they can provide a valuable service, we first have to diagnose the problem that they intend to solve. Here we can identify two possible views, a conventional view and an economist's view, which have quite different implications for policy and strategy of GBCs as well as for our research question. We will discuss both these views here briefly.

2.1. The Conventional View – Circle of Blame

The conventional view of the problem in the transition to sustainable building and construction is usually termed the "vicious circle of blame" (see also Ratcliffe et al., 2009, p. 301ff). It can be found in various business brochures and presentations (e.g., Keeping, 2000, Hartenberger, 2008, Cadman, 2007, Robinson, no year). The term is commonly attributed to D. Cadman (2000) without precise reference[2]. "The 'circle' operates as follows:

- Constructors do not build environmentally-friendly buildings because Developers do not commission them.

- Developers do not commission them because Investors do not require them.

- Investors do not require them because they do not believe that Occupiers demand them.

- Occupiers do not demand them because they say that they are not offered to them.

And round and round it goes." (Cadman, 2007, p. 1f)

This argument basically states that although there is a potential demand for "environmentally-friendly buildings", the market is either too complex for this potential demand to become visible or the market participants are too dumb to see it. If this were really the basic problem of sustainable building and construction, it would be easy to solve for GBCs. They just would need to

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[2]Cadman (2007) claims that he suggested this argument at a conference organized by the British Council of Offices.

make the potential demand of occupiers visible to one investor, who would then request a developer to commission the respective building, who would in turn hire a constructor to build it. Since these actors had identified an unsatisfied demand and therefore a market niche, all of them would make an extra profit. This profit would attract other investors, developers, and constructors into this market niche and lead to a boom of sustainable building and construction.

The circle of blame argument points to ignorance among market participants and lack of information about the market. The most adequate policy to solve this problem would therefore be to provide information. Promotion and awareness building will work well when this view is correct and really describes the main problem for the transition to sustainability in building and construction. Note, however, that the circle of blame argument does not refer to any specific characteristics of the real estate market. It just follows the value added chain of the sector. Consequently, the same argument should apply to every other sector with such a value added chain and not just to the real estate sector. Also note that this argument only employs the relations between actors in general and does not refer to individual buildings or projects in any way. Therefore, it does not provide any hook for arguing against or in favor of certification systems.

In our view, these issues raise serious doubts about the validity of this conventional view of the problem. Looking at the issues more carefully and from the point of view of economic theory suggests a different view, that of a prisoners' dilemma trap. We propose this view as a much more plausible alternative to the conventional one and will lay it out in more detail in the following subsection.

2.2. The Economist's View – Prisoners' Dilemma Trap

The alternative view that we propose uses the same set of actors as the conventional view: constructors, developers, investors and occupiers. The main difference is that it takes into account the production process of individual buildings, the characteristics of the buildings and of the production process, and the relationship between the involved actors and their self interest. Before we lay out the argument in more formal and precise terms below, let us first briefly sketch it.

2.2.1. Sketch of the argument

The starting point of our argument is that buildings are complex entities, the qualities of which are difficult to observe and to verify. This applies particularly to a quality like "sustainability" which is multifaceted and rooted in value judgments. This has substantial implications for the relationship between the actors and for transactions in this market. In each of the transactions between constructors and developers, developers and investors, and investors and occupiers the agent on the demand side cannot perfectly observe the characteristics of a building and therefore cannot be sure to get what he/she pays for. The agent on the supply side, on the other hand, faces the problem that he/she cannot proof some of his/her claims about the characteristics of the building with perfect credibility. Therefore, he/she may not be able to realize the full value of the building in the transaction.

The implication of such a situation on the market has been discussed extensively in economics (see Akerlof, 1970, Spence, 1973, 2002, Rothschild, 1973). In a market with quality uncertainty, sellers have an incentive to claim that the product – the building in our case – is of higher quality than it actually is. Through this he/she may realize a higher price, but because of the quality uncertainty the misinformation may remain undetected. However, since buyers in this market are aware of the incentive structure of the sellers they may be skeptical about such claims and be willing only to pay a small premium for supposedly higher quality. This, first of all, leads to market failure since "dishonest dealings tend to drive honest dealings out of the market" (Akerlof, 1970, p. 495). Second, in this situation buyers and sellers may get caught in a prisoners' dilemma trap: Although both sides of the market may economically benefit from higher quality buildings, buyers will not be willing to pay a sufficient premium for sellers to produce higher quality. As in the conventional view, the result will be that no high quality buildings will be on the market. The reason for that, however, is not ignorance of the market participants, but lack of information about the quality of specific buildings and the possibility for cheating of suppliers because of the quality uncertainty and the resulting reluctance of buyers to pay a sufficient price premium. We will develop this argument more formally and in more detail in the remainder of this section.

2.2.2. The relationship between developers and investors

For the more formal exposition of our argument, let us concentrate on one of the transactions mentioned above, that between a developer and an investor. For the sake of the argument we make some simplifying assumptions that do not impact the general result, however.

In our simplified market developers produce buildings of a certain quality and investors buy buildings from developers. Suppose that there are only two different qualities of buildings: standard quality (s) and good quality (g). Of course, development of a good quality building requires extra resources and is therefore more expensive than the development of a standard building. For simplification assume that developers decide which quality of building to produce[3] and have perfect knowledge about the quality of the building. Investors on the other hand can only imperfectly observe the quality. Therefore, we have an information asymmetry between developers and investors at the time of the market transaction.

Since the investor rents out the building or resells it, and since its quality is revealed over time, the investor's profit depends upon the actual quality of the building. From a good quality building he earns a higher profit than from a standard quality building. Therefore, the investor will also be willing to pay more for a good quality building than for one of standard quality.

Since we are only interested in the incentives to provide good quality build-

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[3]In this formal treatment we ignore the relationship between the developer and the constructor.

ings, we treat the standard quality as baseline in the following discussion. Let c be the extra costs the developer has to bear when he/she develops a good quality building rather than one of standard quality. By π_i we denote the extra profit (the present value at the time of transaction) the investor can generate from a good quality building as compared to one of standard quality[4]. However, the investor will have to pay the developer a higher price for a building of (supposedly) good quality than for one of standard quality. Let this price difference be π_d. For the investor this price is a cost component, for the developer it is the extra revenue for the higher quality of the building.

It is assumed that the investor's extra profit (π_i) depends upon the actual quality of the building, not upon the claim of the developer. The rationale behind this is that the actual quality of the building is revealed to the investor over time through its ability to generate higher rents and/or its lower maintenance costs. Since the quality becomes apparent only over time after the investor has acquired the building, the assumption of a profit differential does not contradict the assumption that the investor cannot observe the building's quality at the time of purchase.

The investor will buy the building only when his/her extra profit in the market (π_i) will be higher than the extra price he/she has to pay to the developer (π_d). Otherwise, the investor will not be willing to buy, because the extra price exceeds his/her extra profit. On the other hand, the price paid to the developer (π_d) must be higher than the extra costs of developing a good quality building (c). Otherwise, the developer will not be willing to sell, because he/she does not get his/her extra costs covered. So, for a transaction to occur, the following condition has to hold:

$$\pi_i > \pi_d > c. \tag{1}$$

All three values are non-negative.

2.2.3. The prisoners' dilemma trap

Based on the assumptions and definitions above, developer and investor are engaged in a one-time two-person game. The payoff matrix of this game is given in Table 1. While the developer can actually decide to build a standard (s) or a good (g) quality building, the investor can only decide whether he/she believes that the building is of standard (s) or good (g) quality. The developer's choice is given in the rows of the table, the investor's choice in the columns. The upper value in every element of the payoff matrix refers to the investor, the lower value to the developer.

When we take into account condition (1), we see that both entries in matrix element gg[5] are positive. So, developer as well as investor would be better off in matrix element gg than in matrix element ss. They both would benefit from a good quality building. The developer would get more than his/her extra costs

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[4]The index i refers to the investor, the index d to the developer.
[5]The first letter indicates the row of the matrix, the second one the column.

		investor	
		s	g
developer	s	0	$-\pi_d$
		0	π_d
	g	π_i	$\pi_i - \pi_d$
		$-c$	$\pi_d - c$

Table 1: Payoff matrix between developer and investor

covered and the investor would generate a higher extra profit in the market than what he/she has to pay more to the developer for the building. When we compare the top values down the rows and the bottom values over the columns we see that gg is optimal also for each actor individually.

However, when we compare the top values over the columns and the bottom values down the rows we see that given the decision of the other actor, for each of the two actors it is economically preferable to chose s. This is the classical prisoners' dilemma trap. Because of this, element ss will be chosen although this result is clearly inferior to gg.

Let us look at the options of each one of the players in turn. The developer has the following options in the model:

1. If he/she expects to find an investor who is willing to pay only for a standard quality building,
   (a) the developer can build a standard quality house at no extra costs, or
   (b) can build a good quality house and sell it at a loss of $-c$.
2. If he/she expects to find an investor who is willing to pay for a good quality building,
   (a) the developer can build a standard quality house, cheat about the quality and make a profit of π_d, or
   (b) he/she can build a good quality house and generate a lower profit of $\pi_d - c$.

In either case, building a standard quality building is the developer's optimal choice. Note that the developer has a strong incentive to cheat about the quality of the building since it yields the highest profit.

The investor has the following options in the model:

1. If he/she deals with a developer who claims the building is of standard quality,
   (a) the investor can pay the price for a standard quality building and make a profit of zero, or
   (b) can pay the premium for good quality and make a loss of $-\pi_d$.
2. If he/she deals with a developer who claims the building is of good quality,

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(a) the investor can pay the price for a standard quality building and make a profit of π_i, or

(b) can pay the premium for good quality and make a lower profit of $\pi_i - \pi_d$.

For the investor, paying the standard quality price is the optimal choice in either case. Because of the prisoners' dilemma situation he/she will never be willing to pay the premium for good quality.

Because of informational uncertainty about the quality of a specific building, developer and investor are trapped in a prisoners' dilemma situation. As a result, no developer will produce good quality buildings and no investor will be willing to pay the premium for good quality buildings, despite the fact that both would benefit economically from such buildings and are aware of that. In this situation, all buildings in the market are of standard quality, the market for good quality buildings simply does not exist. Although we saw that the informational uncertainty creates a strong incentive for developers to cheat about the quality of their buildings, no cheating occurs because there is nothing to cheat about. Because of that there is also no empirical evidence about cheating developers.

2.2.4. The market for good quality buildings

In order to gain some more insights into the mechanisms of this market and particularly into the impacts of cheating, it makes sense to move away from this corner solution. Therefore, in the following discussion we depart slightly from the prisoners' dilemma trap outcome and assume that a small percentage of buildings in the market are of good quality. We do not make any assumptions about who developed these buildings and why. They may have been developed by some public authority, some philanthropic private developer, etc. It is sufficient for our discussion that the chance that a certain building in the market is of good quality is larger than zero. With this assumption we will also be able to derive further results about condition (1) and about the impact cheating by developers has on the market.

Let μ be the probability that a randomly selected building is of good quality. Consequently, the probability that the building is of standard quality is $1 - \mu$. These probabilities are determined by the developers. When the developers build a higher share of good quality buildings, μ will be larger. For the time being, we treat μ as given.

The investor can request information from the developer about the quality of the building. To keep things simple, we assume that the investor can just ask the developer whether the building is of good or standard quality. The developer will supply the investor with a statement that the quality of the building is high (h) or low (l)[6]. Since the developer knows the quality of the building by assumption and since the investor is willing to pay more for a good

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[6]We use the indices s and g for the actual quality of the building and the indices h and l for the information given by the developer.

quality building, the investor will never claim that a good quality building is of standard quality. On the other hand, when the building is of standard quality, the developer has an incentive to claim incorrectly that it is of good quality. So, there is a probability p that the developer cheats, i.e. that he claims a building is of good quality although its quality is really only standard.

On this basis we can state the following conditional probabilities for the developer saying that the building is of good or standard quality given its actual quality:

$$
\begin{align}
P(l|g) &= 0, & (2)\\
P(h|g) &= 1, & (3)\\
P(l|s) &= 1-p, & (4)\\
P(h|s) &= p. & (5)
\end{align}
$$

Based on this we can derive the probabilities of the investor to receive a claim of high or low quality as

$$
\begin{align}
P(h) &= p(1-\mu)+\mu, & (6)\\
P(l) &= (1-p)(1-\mu). & (7)
\end{align}
$$

Consequently, the conditional probabilities that a building is of good or standard quality, respectively, when the developer claims the quality is high are

$$
\begin{align}
P(g|h) &= \frac{\mu}{p(1-\mu)+\mu}, & (8)\\
P(s|h) &= \frac{p(1-\mu)}{p(1-\mu)+\mu}. & (9)
\end{align}
$$

Since the developer will never claim that quality is low when it actually isn't, the respective conditional probabilities for that claim are trivial: $P(g|l) = 0$ and $P(s|l) = 1$.

The probabilities in (8) and (9) depend upon p, the probability that developers are cheating. Substituting the respective values for p gives the results for the two extreme constellations: When the developers do not cheat ($p = 0$) the respective conditional probabilities become $P(g|h) = 1$ and $P(s|h) = 0$. When they cheat with certainty ($p = 1$), the conditional probabilities converge to the unconditional ones: $P(g|h) = \mu$ and $P(s|h) = 1 - \mu$.

In our case of asymmetric information the investor's expected profit from a supposedly good building depends upon these probabilities. At the time of transaction even with a high claim from the developer the investor can get a good quality building only with the probability given in (8). Therefore, the expected profit of the investor at the time of the transaction is just

$$E(\pi_i) = \tau \pi_i, \qquad \text{with} \qquad \tau = P(g|h) = \frac{\mu}{p(1-\mu)+\mu} \tag{10}$$

When we assume a risk-neutral investor, he/she will not be willing to pay a higher premium price than $E(\pi_i)$ for a supposedly good quality building. This yields the following result for π_d in addition to equation (1):

$$\pi_d \leq \tau \pi_i \tag{11}$$

τ represents an upper limit for the developer's profit relative to that of the investor.

When $\tau < 1$, equation (11) implies a stricter criterion for a transaction than (1). For a transaction to be made it is not sufficient that the price to be paid for the building (π_d) is lower than the investor's profit in the market (π_i). Combining conditions (1) and (11) we see that τ also represents a threshold for the ratio between c and π_i:

$$\frac{c}{\pi_i} \leq \tau \tag{12}$$

When this condition does not hold, the investor will not be willing to compensate the developer for the extra costs he/she had for constructing a good quality building. No transaction will be made and the market will collapse. So, for given levels of c, π_d and π_i fulfilling (1), τ determines whether or not a market for good quality buildings will exist. The threshold τ depends upon the share of good quality buildings in the market (μ) and the developers' propensity to cheat (p). Because of its function as a threshold for a market transaction, τ and its relation to μ and p is worth further investigation.

In general, the lower τ is in a market, the less likely conditions (1), (11) and (12) all hold and a market for good quality buildings exists. When $\tau = 0$, such a market cannot exist, because there are no positive values for c, π_d and π_i that simultaneously satisfy all three conditions.

By assumption we have $0 \leq p \leq 1$ and $0 \leq \mu \leq 1$. These limits imply some limits for τ. They result from substituting the limits for p and μ into the definition of τ in equation (10). It is straightforward to see that $p = 0$ implies $\tau = 1$, and $p = 1$ implies $\tau = \mu$. When μ takes on the limiting values 0 or 1, τ also goes to 0 or 1 respectively. Since τ is equal to the conditional probability $P(g|h)$, it cannot be smaller than zero or larger than one.

The relationship between τ and p for different values of μ is shown in Figure 1. For values of $0 < \mu < 1$ the functions seem to fall monotonically and it seems to increase with higher values of μ. When we take the first derivative of τ as defined in equation (10) with respect to p, we find that it is negative for all $0 < \mu < 1$:

$$\frac{\partial \tau}{\partial p} = -\frac{\mu(1-\mu)}{(\mu + (1-\mu)p)^2} \tag{13}$$

This result shows that as long as μ is between its boundaries an increase in
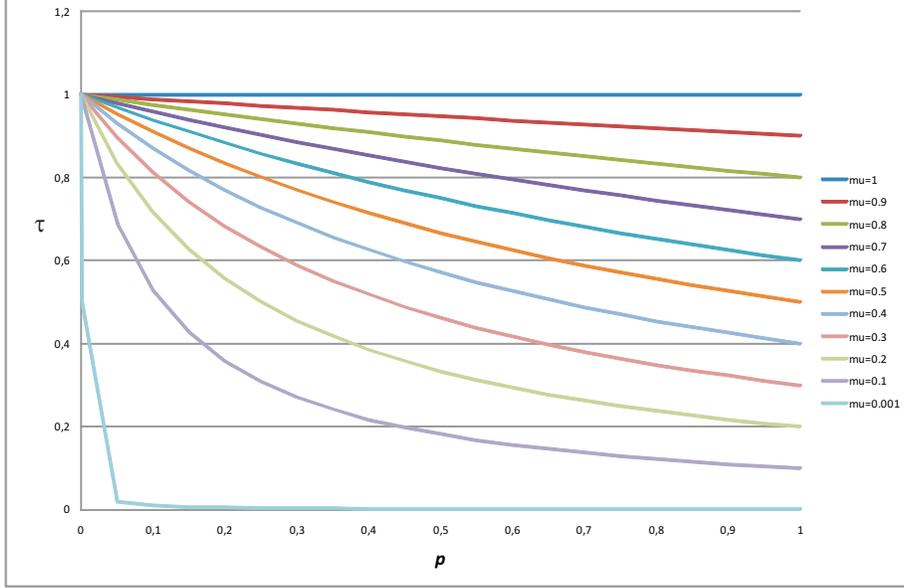
Figure 1: τ as a function of p for various values to μ (mu)

the developers' propensity to cheat always lowers the share of their profit the investors are willing to pay for supposedly good quality buildings.

Since the second derivative of τ with respect to p is positive for $0 < \mu < 1$, we can conclude that this damaging effect of an increase in the cheating propensity is particularly strong at low levels of p.

$$\frac{\partial^2 \tau}{\partial p^2} = \frac{2\mu(1-\mu)^2}{(\mu + (1-\mu)p)^3} \tag{14}$$

Similarly, when we take the derivative of τ with respect to μ, we find that it is positive as long as $p > 0$:

$$\frac{\partial \tau}{\partial \mu} = \frac{p}{(\mu + (1-\mu)p)^2} \tag{15}$$

This result shows that a given propensity of developers to cheat leads to a lower threshold τ the lower the share of good quality buildings is in the market. Stated differently, the damaging effect of cheating developers is larger the rarer good quality buildings are in this market. This becomes particularly clear when we look at the marginal change of τ at $p = 0$, i.e. the effect that a slight suspicion that developers may cheat will have on the value of the threshold. By substituting $p = 0$ into equation (13) we get

$$\frac{\partial \tau}{\partial p}\bigg|_{p=0} = -\frac{1-\mu}{\mu} \equiv S_0 \tag{16}$$

Taking the derivative of S_0 with respect to μ shows that the effect of a slight suspicion of cheating developers is more severe the lower the share of good buildings is in the market:

$$\frac{\partial S_0}{\partial \mu} = \frac{1}{\mu^2} \tag{17}$$

Our discussion of the relationship between developer and investor above and our conclusion that they are linked in a prisoners' dilemma state indicated that

1. no good quality buildings will be developed in this market and that
2. developers have a strong incentive to cheat and claim that their standard quality buildings are of good quality.

Formally these results imply $\mu = 0$ and $p = 1$. In the previous analysis we found that this combination of parameter values implies a threshold value of $\tau = 0$. In such a market, if some good quality buildings are developed for whatever reason, this move will not be sufficient to overcome the implied barrier. As we saw, investors will not be willing to pay a sufficiently high price for good quality buildings, because of their difficulty to identify them. Moreover, in a situation where good quality buildings are emerging in the market and therefore rare, even the slightest suspicion that developers may be cheating about the quality of buildings will lower the threshold value τ dramatically and may lead the emerging good quality building market to collapse.

3. GBCs as Elements of Governance

In a situation like the one we discussed in the previous section, GBCs can play a decisive role by influencing the two key parameters μ, the probability that a randomly selected building is of good quality, and p, the chance that a developer cheats about the quality of his building. Through certification GBCs can on the one hand generate a market segment of certified buildings with a higher value of μ than in the market as a whole, and on the other hand lower p through the threat of not awarding certificates to cheating developers or of withdrawing certification from their buildings. As our discussion showed, both mechanisms will increase the threshold level τ, which in turn will lead to an expansion of the market for good quality buildings further increasing μ. This way GBCs can contribute to the establishment of a market for good quality buildings.

3.1. Governance and governance institutions

Such an enabling function is typical for governance institutions as they are discussed in new institutional economics (e.g., Dixit, 2003, 2004, 2009). Since

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GBCs are non-governmental organizations, it is important to assume the point of view of economic governance (Dixit, 2004, 2009) rather than policy. The difference is that policy is in the hands of the government while governance may be provided by public as well as private institutions and consequently "*governance* and *government* should not be regarded as almost synonymous" (Dixit, 2009, p. 6). Economic governance focuses on institutions and their scope of activities including economic problems they handle.

In the understanding of new institutional economics, economic governance describes formal rules within and between organizations with the aim to reduce transaction costs (Williamson 2000). As Williamson (2005) pointed out, governance was not top on the agenda of economists and other social scientists mainly because there was this common understanding of being covered and provided by governments. Since economic transactions are not fully covered by the market the question of alternative forms of coordination is the core within this discussion. The economics of governance as Williamson (2005) defined it, "has helped to persuade many economists and other social scientists that (1) institutions matter and are susceptible to analysis, (2) adaptation to disturbances is a key purpose of economic organization, (3) the action is in the microanalytics, (4) positive transaction costs can be addressed in a comparative way, and (5) public policy toward business needs to be informed by a broad (organizational) understanding of the efficiency purposes served by complex contract and economic organization" (p. 15).

"Economic governance is important because markets, and economic activity and transactions in general, cannot function well in its absence" (Dixit, 2009, p. 5). Dixit sees three essential prerequisites of market economies that are provided by governance institutions: security of property rights, enforcement of contracts, and collective action. By securing property rights governance institutions guarantee that economic actors who save and invest can benefit from this activity and therefore have an incentive for saving and investing in the first place. Through the enforcement of contracts governance provides the basis that each partner in a contract can expect to receive the agreed compensation in a transaction. Through collective action governance institutions implement measures for the provision of public goods – or the control of public "bads" – and for limiting free riding behavior. When a governance organization or institution contributes to the provision of one or more of these three prerequisites, it may serve an important function in the respective market and may therefore enjoy some stable performance over time. If not, the respective organization or institution will be seen as useless and sooner or later disappear.

3.2. GBCs as governance institutions

Whether or not GBCs can serve an important function, is one of the research questions of this paper. The answer is again closely connected to the view we have about the basic problem in the transition to sustainable construction and buildings as we have discussed it in section 2. Although the symptoms are quite similarly described by the conventional and the economists' view, the diagnosis of the problem differs substantially. As a consequence, the two

views also lead to very different suggestions for therapy and have quite different implications for the evaluation of GBCs as governance institutions and suggest quite different strategic actions to them. If the conventional view of the circle of blame adequately describes the problem, the solution is relatively simple and most economists would probably argue that there is no governance issue at all. Since the problem lies in the general lack of knowledge about the economic value of sustainable buildings, market actors simply need to be informed. One could argue that providing information and raising awareness is a task for collective action in this case. This task could be taken on either by some government organization or by some non-governmental organization like a GBC. However, two questions arise in this context: First, why does not this information spread automatically in the economy, and, second, is it possible to privately organize some collective action in this instance?

We have already touched upon the first question in section 2.1 above. If lack of information really were the problem it would just need one economic actor to see this market opportunity. He/she would utilize it, make a higher than normal profit and through this example spread the information to the other actors in the market who would follow the example of the pioneer. The answer to the second question can be derived directly there from. Privately organized collective action requires at minimum some collective awareness of the problem and a group willing to resolve it. Under the assumption that the circle of blame argument is correctly describing the problem, however, this requirement is not fulfilled. Those actors who are aware of the problem will not want to resolve it through collective action but utilize it for their individual benefit. Those who are not aware of the problem will not be ready to engage in collective action[7]. So, under the conventional view it is doubtful that GBCs could even be formed. And, if formed, they would not serve an important function in the market and disappear over time.

When we subscribe to the economic view that we discussed in section 2.2, the situation is completely different. It is well known from the literature on game theory (see e.g., Fudenberg, Tirole, 1991, Gibbons, 2001) that the market by itself cannot resolve the problem of the prisoners' dilemma trap. There is an obvious need for governance. In principle there are two approaches for governance and regulation in this situation. One of them is to establish a high enough risk of penalty for cheating agents (developers in our simple formal example). Another approach for governance directly targets the underlying information asymmetry and establishes mechanisms that provide more accurate and reliable information about the true quality of a building.

Although there is a strong incentive for developers to cheat about the quality of their buildings, as we have seen in the previous section, in a developed economy they cannot do this without risk. Since the true quality of a building will become apparent over time, also the cheating of the developer will become

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[7]This argument applies only to privately organized collective action and not to governmental policy (e.g., awareness campaigns).

transparent. Once this is the case, a cheating developer may be penalized in a number of ways. First, the investor may take him to court and request to get his money back and maybe also to be compensated for any extra costs or damage caused by the inaccurate claim of the developer. Whether this will work for the investor and will penalize the cheating developer depends on a number of factors: the quality of the legal institutions in the respective country, the quality of its justice system, the position and reputation of investor and developer in the respective legal structure. But, even in a perfect legal environment the investor will have to prove the cheating of the developer and the standard quality of the building which may become more and more difficult the more time elapses before the true quality of the building becomes apparent. In most countries the investor will also be confined by some limitation period for his claims.

Second, the developer may be stigmatized as a cheater in the market and be penalized by potential trading partners. They may avoid trading with him, request extra securities, or be willing to pay only lower prices. In economics this situation is modeled by repeated games that give rise to reputation effects (Kreps, Wilson, 1982, Milgrom, Roberts, 1982, Mailath, Samuelson, 2006). While the early literature was quite optimistic about reputation effects eliminating the cheaters, more recent literature (Ely, Vlimki, 2003, Ely et al., 2008) raises some doubts and shows that under more general assumptions reputation alone will not be sufficient for the desired result. In any case, in the real estate market, where products are highly complex and bad quality may take a long time to become visible, reputation effects will probably work only slowly and need a long time to eliminate cheaters.

The second approach tackles the very source of the problem, the incomplete information, by installing an organization that certifies the quality of a building and thus eliminates or at least reduces the uncertainty and the chance for cheating. In Dixit's typology this falls under the category "enforcement of contracts" since it makes a trading contract more reliable. Within this category Dixit (2009) categorizes such an institution as a "third-party institution". "Third-party institutions provide governance by outsiders who are not direct parties to this class of transaction" (Dixit, 2009, p. 14). GBCs take on exactly this position when they certify the "green" or "sustainable" quality of buildings through the application of a rating system. They act as a third party institution that reduces or even eliminates the quality uncertainty and in this way may break the prisoners' dilemma trap for transactions involving this one building. The effect, however, is not confined to the transactions involving this building, but has implications also for the market as a whole (see section 2.2). The certification on the one hand increases the share of high quality buildings and on the other hand reduces the probability of cheating. In our model, both effects increase the investor's expected profit ($E(\pi)$). This positive external effect of certification is the contrary effect to the damage that cheating does to the market and it may help to develop a more reliable and trustworthy market.

When GBCs can provide this service of reliably certifying the quality of buildings, they will be seen as valuable actors in the respective market and may be able to establish themselves as essential governance institutions. Since

this service is valuable not only to the actors trading the certified building, but also to other market participants through the mechanism described above, we conclude that such GBCs will also meet more support from industry than those who do not provide this service.

This can only work, of course, when the respective GBC is perceived as honest and as a reliable source of information. Dixit (2009) alerts us that "honesty of these third parties is not automatic" (p. 15). The third parties, GBCs in our case, are economic actors as well who pursue their own goals and interests[8]. It is essential for the GBCs to organize themselves in such a way that their own goals and interests are compatible with the governance function they have to perform. Size plays an important role there. On the one hand, young and small GBCs who need to bring in members, assessors, and projects for certification in order to grow may be vulnerable to pressure to bend rules and regulations and may also be less strictly applying their standards. On the other hand, the larger the operation of a GBC and the more individuals are involved, the more difficult it will be to keep a standard throughout the organization and to keep out cheaters from their own ranks.

In addition to the reputation of the issuing party, the certification has to have additional characteristics in order to serve the requested function. It has to apply standards that are on the one hand sufficiently high so that the certificate really identifies buildings of higher quality, and on the other hand are low enough so that a sufficient number of buildings can acquire a certificate in order for the certificate to be visible in the market and to build up a reputation. To balance these conflicting needs and find an acceptable compromise between them is a major challenge for GBCs that run a certification program. A similar challenge lies in the question of how general or specific the rating system should be. This issue is particularly important for rating systems that are applied to more than one country. If the rating system applies the same standards everywhere, it will miss some specific qualities and circumstances of many of the buildings under consideration. If the rating system adapts too flexibly to specific conditions, the results of the evaluation may lose comparability and the system may become vulnerable to bending to local demands. Again, finding the right solution between these extremes is an organizational challenge for GBCs. To summarize this discussion, being able to apply a rating system to buildings is a necessary condition for GBCs to fulfill an economically valuable function. However, the availability of a rating system is not sufficient, since there are a number of tricky organizational issues and design questions to solve.

4. Summary, Conclusions and Outlook

In this paper we looked at Green Building Councils (GBCs) and their potential role in the transition toward a "greener" or "more sustainable" building structure. As we discussed in section 1 and show in the appendix, the GBCs

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[8]As non-governmental organizations they usually pursue another objective than profit.

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that have been started in numerous countries around the world pursue quite different aims and strategies. In section 1 we categorized them into the areas "awareness building", "lobbying" and "certification".

Whether or not GBCs can play a valuable role in the economy and which of the above mentioned areas of activity is crucial for that, was the main research question of the paper. To be able to answer this question, we first had to look more carefully into the building market and the problems of the transition toward the development of "green" or "sustainable" buildings. This aspect was discussed in section 2. There we distinguished between a conventional view, the "circle of blame", and an economist's view, which is based on the prisoners' dilemma argument derived from game theory. Looking at the complexity of the involved products, the informational challenges they pose, and the actors involved, we see strong support for the economist's view that the actors may be caught in a prisoners' dilemma trap. In section 2 we also discuss the implications this may have for the market of "green" or "sustainable" buildings. We show that the informational problems associated with the identification of the quality of buildings and the strong incentive for developers to cheat about the true quality of a building they want to sell to an investor severely hampers the development of a market of "green" or "sustainable" buildings. In the extreme, these circumstances may even completely eliminate the market.

What role GBCs can play in such a situation is discussed in section 3. There, we view GBCs as "governance institutions" and embed them into the respective literature on economic governance. We find that they can play the role of "third party institutions" that improve the enforcement of contracts by reducing informational uncertainty through certification and thus making the respective contract more reliable. From section 2 we know that such activities not only support the individual deal between developer and investor, but also have positive external effects on the market as a whole by increasing the availability of good quality buildings and reducing the probability for cheating.

GBCs are too new a phenomenon to allow for a sound empirical evaluation yet. Most of them are in an early stage of development and they are mutually related through simultaneous processes of cooperation and competition. Nevertheless, from our analysis we can draw some conclusions that imply hypotheses for the future role and development of GBCs in the construction industry. If the informational asymmetry and uncertainty is the main problem in the transition toward a "greener" or "more sustainable" building stock, GBCs can help resolve this problem by getting involved in the individual transactions as third party institutions. To perform this role, they need to have available and apply a transparent certification schema for the quality of buildings that is accepted by the respective industry. GBCs that only focus on awareness building and lobbying and do not engage in the certification of individual buildings will find it difficult to develop the necessary industry support and acceptance.

Reliability and acceptance by industry imply a substantial challenge for the management of GBCs. On the one hand they need to cooperate with the respective industry in order to sustain its support, but without compromising the criteria of the certification schema. On the other hand they need to balance the

certification standards between high enough to identify exceptional quality and low enough to be achievable for a large enough group of developers.

Summarizing it can be said that GBCs can play an important role in the improvement of the building industry. This function, however, is accompanied by serious challenges related to their position as third party institutions. Only the future will tell whether or not GBCs are able to live up to the expectations and can fulfill this governance function. A better understanding of their role in the market that this article attempted to develop may help them to meet the challenges.

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Appendix: Results of the Survey of World Green Building Council Member Organizations

In February and March 2010 a web-based survey was conducted of GBCs worldwide. Of the 47 institutions approached, 26 (55%) answered the survey. 36% of those were established GBCs, with 25% the associated groups formed the second largest group among the respondents. The majority of these institutions are small-scaled with a maximum of five staff members.

Aims

In order to investigate how sustainable GBCs are themselves which clearly focuses on their governance function their activities' profile helps to learn more about their overall aims. Hence the survey focused separately on these two different aspects. One part of the questionnaire concentrated particularly on the council's concrete daily activities and the results clearly show a differentiated picture of the different types of GBCs. The biggest group in our sample, the established GBCs, follows a more structured activity path mainly fostering membership issues like attracting new members whereas the more recently founded GBCs (associated and prospective) are concerned with more general

Aims	1 Membership[a]	2 Certification system[b]	3 Training & Education
in the establishing phase (N=21)	13	3	3
in the consolidation phase (N=15)	7	5	4

[a] attract more members; mix of members

[b] implementation of own or adaptation of existing certification system

Table 2: The three most important aims

tasks like promotion and communication in order to make themselves more acquainted. In terms of theirs aims we asked respondents to assess the three most important objectives in both the early phase of establishing the council and the later consolidation phase which includes concrete operations and can be seen as running a business. The results are not surprising since membership (number 1 in the ranking), certification (number 2), and training & education (number 3) were identified as the three most important goals in both phases (see table 2).

Membership has been defined and interpreted as attracting a mix of new members belonging to different target groups with the aim of strengthening the multi-stakeholder network. As non-governmental organizations GBCs are non-profit oriented and are therefore extremely dependent on membership fees which help them to run their small businesses. Besides this GBCs are interested in attracting a balanced mix of different members which altogether are representing the real estate market in the particular countries. The implementation of a new and/or adaptation of an existing certification system has been assessed as the second most important aim which emphasizes their role as third party institutions. External third-party certification is the most reliable form of certification and defined as a 'new mechanism' of environmental governance often driven by multi-stakeholder organizations. In the case of GBCs the councils can address various stakeholders which are acting in a straight forward market driven environment as long as they fulfill several criteria in order to be reliable and approved. The third most important aim can be subsumed as training & education which covers training for auditors as well as public awareness raising activities. The three most important goals are strongly interlinked amongst themselves and hence they appear as well as the three most important aims in the consolidation phase. Table 2 confirms that certification systems are becoming more important which supports our arguments in section 3 where we argued that GBCs as third party institutions can help to reduce informational uncertainty through certification. Membership issues are assessed as continuously important since a growing network helps the councils to run their businesses and to diversify their activities.

Figure 2: Factors and their importance for the mid-term goals (all GBCs: 1=highly applicable, 2=applicable, 3=less applicable, 4=not applicable)

4.1. Strategies

In order to determine GBCs' future strategies we selected eight factors belonging to different categories of activities and asked GBCs to assess the factors importance for their mid-term goals (Figure 2). These factors can in the broadest sense be allocated to the three aims identified above – membership, certification, and training & education. Knowledge pooling, national and international lobbying are factors supporting the multi-stakeholder network and are therefore strongly interlinked to the aim of building up a pool of mixed types of members. Workshop organization is slightly correlated with training & education. All the other factors are specifically related to certification with different foci ('development of own certification', 'adjust an existing certification system', evaluate buildings for certification', 'award certificates', 'maintenance of a certification system'). Since our sample consists of different type of GBCs, the overall picture of the factors assessment does not show big differences within the certification related factors. The only variation results in the factor 'develop own certification system' and 'international lobbying', both activities indicating more advanced experience and practice.

In Figure 3 all groups of GBCs and their assessments are combined. A closer look at the five factors related to building certificates shows differences in the assessment of the different groups while the importance of the other factors seems to be more homogenous. There are differences between the groups of GBCs especially concerning the factors 'award certificates', 'evaluate buildings for certification', and 'develop own certification system', all factors which seem to be more important for established GBCs while all other GBCs assessed it
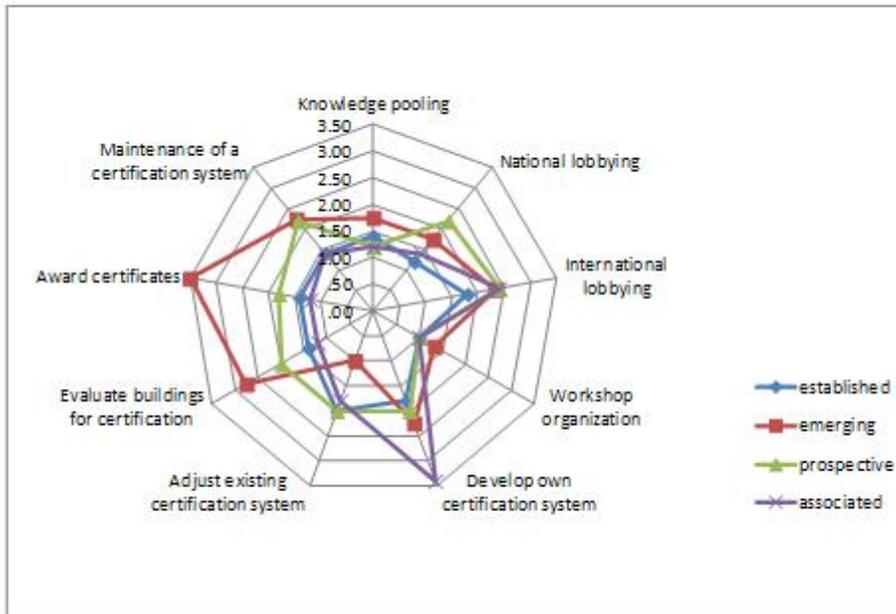
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Figure 3: Factors and their importance for the mid-term goals (different groups of GBCs: 1=highly applicable, 2=applicable, 3=less applicable, 4=not applicable)

lower.

Two factors 'knowledge pooling' and 'workshop organization' seem to be strategically important for all types of GBCs independent of their development phase whereas all factors related to certification become more important in later stages of their development. Third-party certification has been identified in section 3 as the critical factor for guaranteeing good quality buildings but it essentially depends on the reliability and credibility of the organizations being responsible for certification. Therefore it seems to be apparent that GBCs have to qualify themselves for certification activities before they will be accepted as reliable and credible actors.

Institut für Regional- und Umweltwirtschaft
Wirtschaftsuniversität Wien
Institutsvorstand : ao.Univ.Prof. Dr. Franz Tödtling
Nordbergstraße 15
A-1090 Wien, Austria
Tel.: +43-1-31336/4777 Fax: +43-1-31336/705 E-Mail: ruw@wu.ac.at
http://www.wu.ac.at/ruw