

DOES SMART EQUAL SUSTAINABLE? SELECTIVE COUPLING AND SUSTAINABILITY PERFORMANCE IN 251 SMART CITY INITIATIVES UNDERSTOOD AS HYBRID ORGANIZATIONS

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ABSTRACT

This paper depicts smart city initiatives as hybrid organizations that incorporate competing institutional logics. These logics are not equally pronounced across initiatives. The salience of the logics affects initiatives' selective coupling with economic, social, and environmental sustainability and, hence, their triple-layered sustainability performance. We suggest that the performance-related selective coupling is driven by two mechanisms: leveraging experience and seeking legitimacy. An empirical analysis of 251 initiatives supports our arguments. In line with the theory of selective coupling, we further find that initiatives embedded in a market logic display better overall sustainability performance than those embedded in a social welfare logic.

INTRODUCTION

The “smart city” concept seeks to address some of the most urgent challenges of progressive global urbanization: overcrowded traffic, energy, and water supply infrastructures, security problems, housing deprivation, and inclusion issues (Gassmann et al., 2019). A city can be called smart if it uses “information technology to solve the spatial, economic, environmental, and social issues affecting urban environments” (Mora et al., 2019: 2). Around the world, national governments, non-governmental organizations, city alliances, and many other stakeholders promote the smart city concept in pursuit of sustainable urban development (Acuto & Leffel, 2020). While countless cities claim to have implemented smart city initiatives (SCIs), not all of them perform well in terms of environmental, social, and economic sustainability (Mora et al., 2017; Yigitcanlar et al., 2019). The causes of such heterogeneity in sustainability performance across SCIs are so far poorly understood.

Like hospitals, state-owned enterprises, public-private partnerships, and social enterprises, SCIs are expected to comply with a social welfare logic as well as with a market logic. Hence, they belong to the growing number of hybrid organizations (Greenwood et al., 2011). Hybrid organizations face multiple and competing institutional demands and incorporate elements of these divergent institutional logics (Battilana & Lee, 2014). Neo-institutional theory (DiMaggio & Powell, 1983; Meyer & Rowan, 1977) has long argued that some organizations engage in “decoupling”; that is to say, they pursue a mere symbolic adherence to institutional demands that is not associated with substantive adaptations of organizational processes. Decoupling can allow them to gain legitimacy while pursuing goals that decision makers favor

over institutional demands (Boxenbaum & Jonsson, 2017). Decoupling may explain why some urban initiatives use the smart city label but contribute little to sustainability. Building on the notion of decoupling, Pache and Santos (2013) observed that hybrid organizations may selectively couple with demands originating in different institutional logics. In contrast to decoupling, selective coupling is not only symbolic but also substantive; i.e., organizations adapt their actual processes and strategies to the logic with which they selectively couple (Pache & Santos, 2013). Applying the notion of selective coupling to SCIs, it may well be that SCIs differ not only in the extent to which they contribute to sustainability as a whole but also in the respective extents to which they contribute to economic, social, and environmental sustainability.

Our article uses selective-coupling reasoning to investigate the heterogeneity of SCIs in their sustainability performance. It argues that the sustainability performance of initiatives is driven by two mechanisms. First, the congruence or fit between the dominant institutional logic and the sustainability dimension. Specifically, the more that SCIs are embedded in a market logic, the better they will perform in terms of economic sustainability; and the more that SCIs are embedded in a social welfare logic, the better they will perform in terms of social sustainability. Second, SCIs will also perform well in sustainability dimensions with which they have coupled selectively in pursuit of legitimacy – legitimacy they may otherwise lack in the eyes of important stakeholders. Whereas SCIs embedded in a social welfare logic may lack economic credibility and, hence, couple selectively with economic sustainability, SCIs embedded in a market logic may lack non-economic credibility and will, hence, couple selectively with non-economic (specifically, environmental) sustainability. Taken together, the two mechanisms suggest that SCIs – irrespective of their prevalent embeddedness in a market or a social welfare logic – may perform well in two sustainability dimensions and poorly in the third. Based on an empirical analysis of 251 SCIs in Switzerland, we find strong support for our theoretical arguments. Our study makes four contributions to the theory of selective coupling and smart city research.

THEORETICAL BACKGROUND AND HYPOTHESES

Neo-institutional theory has recently started to examine decoupling in the context of hybrid organizations that have to navigate and respond to multiple and competing institutional logics – for the most part, the market logic versus the social welfare logic (e.g., Alexius & Grossi, 2018). Hybrid organizations have been found to go beyond decoupling and to apply selective coupling; i.e., they adhere to one institutional logic in some regards and to a competing institutional logic in others (Pache & Santos, 2013). Since selective coupling has been found to be substantive rather than merely symbolic (Pache & Santos, 2013), it is likely that organizations will perform well with respect to prominent goals in the institutional logic with which they have coupled.

Two motives can drive selective coupling and subsequent performance (cf. Pache & Santos, 2013). On the one hand, organizations may selectively couple with – and perform well with respect to – those institutional logics in which they have gained considerable experience and that fit their imprint and their familiar processes (Marquis & Tilcsik, 2013). Applying this fit argument to SCIs and the three sustainability dimensions, we propose:

Hypothesis 1: SCIs will perform well in the sustainability dimension that exhibits a close fit to the institutional logic dominating the initiatives. Specifically, (H1a) the more that SCIs are embedded in a social welfare logic, the better they will perform in terms of

social sustainability. (H1b) The more that SCIs are embedded in a market logic, the better they will perform in terms of economic sustainability.

On the other hand, Pache and Santos (2013) observe that hybrid organizations selectively couple with those institutional logics in which they lack a priori legitimacy. Because SCIs embedded in a social welfare logic are likely to possess less economic credibility than initiatives embedded in a market logic, we expect them to couple selectively with economic sustainability. In contrast, initiatives embedded in a market logic may lack non-economic credibility and will, hence, couple selectively with non-economic sustainability. Specifically, we expect them to couple selectively with environmental rather than social sustainability because organizational decision makers tend to pay greater attention to environmental (and economic) than to social sustainability (Govindan et al., 2021; Staniškienė & Stankevičiūtė, 2018). Social sustainability is affected by more subjective, qualitative factors than environmental sustainability; it is more context and time dependent; and the analytical tools to address social sustainability tend to be less well developed (Glaser & Diele, 2004; Lee & Jung, 2019; Staniškienė & Stankevičiūtė, 2018).

Pache and Santos (2013) argue that adopting behaviors supportive of a particular institutional logic enables actors who possess little legitimacy with respect to the said institutional logic to gain legitimacy and acceptance among the proponents of this logic. The authors called this strategy the “Trojan horse” because it echoes the story of Odysseus who built a wooden horse to provide him with legitimacy among the citizens of Troy (whose symbol was a horse). Applying this “Trojan horse” argument to SCIs and the triple bottom line, we propose:

Hypothesis 2: SCIs will perform well in a sustainability dimension in which they lack a priori legitimacy due to the institutional logic by which they are dominated. Specifically, (H2a) the more that SCIs are embedded in a social welfare logic, the better they will perform in terms of economic sustainability. (H2b) The more that SCIs are embedded in a market logic, the better they will perform in terms of environmental sustainability.

Finally, Pache and Santos (2013) observe that possessing a priori legitimacy liberates hybrid organizations at least in part from institutional influences: “Their initial legitimacy, combined with a minimal level of compliance with social welfare templates, was enough to please their social constituencies” (p. 995). This “institutional freedom” (p. 995) allows them to be more selective in their coupling decisions. Hybrid organizations originating from a social welfare logic tend to possess greater a priori legitimacy with respect to sustainability as a whole than hybrid organizations originating from a market logic (Tabares, 2021). Hence, we expect that SCIs embedded in social welfare logic will couple more selectively with overall sustainability demands than initiatives embedded in a market logic. As the latter will couple more extensively with sustainability in general, we expect their overall sustainability performance to be higher.

Hypothesis 3: *SCIs embedded in a market logic will display a better overall sustainability performance than SCIs embedded in a social welfare logic.*

DATA AND METHODS

Six researchers conducted a qualitative content analysis of 251 SCIs in 71 cities in Switzerland. No commonly accepted approach to assess triple-bottom-line sustainability has yet been established – neither in the organizational nor in the city development context (Kaur & Garg, 2019; Mura et al., 2018). We therefore developed a new framework to assess sustainability in cities using a total of 24 indicators across the three sustainability dimensions.

To evaluate the sustainability performance of the 251 smart city projects in economic, social, and environmental terms, the six coders rated each SCI on these 24 criteria using Likert scales ranging from -2 to +2. The possibility of assigning negative scores accounts for the fact that SCIs may not only create value but could also destroy value (Bocken et al., 2015).

To assess the extent to which an SCI is embedded in a market or a social welfare logic, we characterize each initiative by the type of good that it is offering. SCIs offering a private good are considered to be heavily embedded in a market logic, initiatives offering a public good to be heavily embedded in a social welfare logic, and initiatives offering a club good or a common good to possess an intermediate embeddedness on this continuum (Ostrom et al., 1994).

RESULTS

Table 1 summarizes the triple-layered sustainability assessments for the four types of good. It is noteworthy that all entries in the table are positive, indicating that SCIs on average create value (rather than destroy value) in all sustainability dimensions, irrespective of whether they originate from a market or a social welfare logic. In line with H1a, public-good-based SCIs display the highest average score with respect to social sustainability, private-good-based SCIs the lowest, and club- and common-good-based SCIs fall in between. In line with H1b, private-good-based SCIs perform best in terms of economic sustainability. However, the economic performance of public-good-based SCIs is superior to common- and club-good-based SCIs. Overall, the results still support Hypothesis 1. Public-good-based SCIs outperforming common- and club-good based SCIs in terms of economic sustainability is in line with H2a. That private-good-based SCIs display the highest average score with respect to environmental sustainability, public-good-based SCIs the lowest, and club- and common-good-based SCIs fall in between accords with H2b. Overall, the results support Hypothesis 2. Finally, the finding that private-good-based SCIs achieve the highest overall sustainability score supports Hypothesis 3.

Insert Table 1 around here.

DISCUSSION

In offering the first study to analyze SCIs from the perspective of selective coupling, we find strong support for our theoretical account. The more that SCIs are embedded in a social welfare logic, the better they tend to perform in terms of social sustainability and economic sustainability. The more that SCIs are embedded in a market logic, the better they tend to perform in terms of economic sustainability and environmental sustainability. Moreover, SCIs embedded in a market logic – which suffer from the greatest a priori lack of legitimacy regarding sustainability in general – tend to deliver a better overall sustainability performance than SCIs

embedded in a social welfare logic. Our study makes four contributions to the neo-institutional theory of selective coupling and smart city research.

First, Pache and Santos (2013) proposed that hybrid organizations may adopt different response strategies to cope with multiple institutional demands, depending on whether they are exposed to conflicting demands related to either goals or means. Their own study examined how selective coupling affects organizations' structural choices and recurrent practices for which the market logic and the social welfare logic may have divergent preferences. Thus, their study emphasizes means. In contrast, our study investigates how selective coupling affects organizations' sustainability performance – i.e., goals. Pache and Santos's (2013) findings regarding means corroborate the "legitimacy seeking" motive behind selective coupling but contradict the "leveraging experience" motive. In contrast, our study indicates that selective coupling affects goals through both mechanisms. This difference in the respective findings may be explained by the effectiveness of experience and accrued competence. Hybrid organizations may be so skillful in the domain of their dominant institutional logic that they do not have to engage heavily with the domain's means, but they still perform well with respect to its goals.

Second, our study complements Pache and Santos's (2013) work in that the institutional logics preferred competing solutions for each of the analyzed means. Thus, the organizations had to decide for each mean whether they would adopt the solution preferred by logic A, the one preferred by logic B, or forge a compromise. In contrast, the three sustainability dimensions analyzed in our article are not competing alternatives as such. Organizations may be able to find strategies and measures that advance multiple sustainability dimensions simultaneously.

Third, the sheer variety of smart city projects (apps, sensor systems, digitally enabled networks, policies, etc.) pose challenges to smart city frameworks seeking to measure the sustainability performance of these projects. City development research is highly fragmented with respect to sustainability measurement (Kaur & Garg, 2019). Existing frameworks do not provide a comprehensive sustainability assessment (Ahvenniemi et al., 2017). We therefore devised a new sustainability assessment framework that is grounded in the triple bottom line.

Fourth, our study improves our understanding of the antecedents of sustainability performance in SCIs. It provides a comprehensive account of smart city projects in an entire country and acknowledges that SCIs may not always create sustainability value but could also destroy sustainability value (Bocken et al., 2015; Raworth, 2017). Nevertheless, we observe that SCIs on average create value in all sustainability dimensions, irrespective of their origin in a market or social welfare logic. Our study therefore serves to alleviate recent concerns that cast doubt on the sustainability orientation of the smart city concept (e.g., Colding & Barthel, 2017).

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Table 1. Sustainability performance of 251 smart city initiatives according to dominant institutional logic (type of good)

Dominant Institutional Logic	Type of Good (# Sample)	Performance Economic Sustainability	Performance Environmental Sustainability	Performance Social Sustainability	Overall Sustainability Performance
Market Logic	Private Good (48)	0.82	0.44	0.40	0.55
	Club Good (26)	0.57	0.30	0.40	0.42
	Common Good (20)	0.54	0.42	0.48	0.48
Social Welfare Logic	Public Good (158)	0.62	0.30	0.51	0.48