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Policy Diffusion Through Multiple Streams: The (Non-) Adoption of Energy Conservation Building Code in India

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Although the diffusion of policy innovations can promote sustainability, how this process can be accelerated remains unclear. I address this gap by conceptualizing policy transfer and policy diffusion using the multiple streams framework (MSF) and developing hypotheses to connect them. I apply this theorization to explain the limited spread of the energy conservation building code (ECBC) in India by combining a process trace of policy adoption in the embedded case of Andhra Pradesh with a dyadic event history analysis of state-level diffusion during 2012-18. The data for this study are collated from official statistics, elite interviews, news reports, policy documents, and secondary literature. The qualitative analysis shows that policy transfer to Andhra Pradesh occurred when external influence and prior adoption elsewhere were used by a policy entrepreneur to exploit a window of opportunity and couple problem, policy, and politics in the state; the dyadic analysis demonstrates that policy diffusion was influenced by the interaction among the structural characteristics of the problem, policy, and politics streams. I conclude with the implications for research on policy diffusion and the MSF as well as the relevance of the findings for promoting policy innovation for a sustainable energy transition.

KEY WORDS: climate change mitigation, multiple streams framework, policy diffusion, policy entrepreneurship, policy innovation, policy learning, policy transfer, sustainable energy transition

政策扩散文献的发展已与政策变革研究相分离，尽管二者存在紧密联系。通过使用多源流框架（*MSF*）并就"连接政策转移和政策扩散"提出假设，我对政策转移和扩散进行概念化，以期应对该二分法。通过对安得拉邦嵌入式案例中的政策采纳进行过程追踪，并对*2012*年至*2018*年间的邦级政策扩散进行配对事件史分析（*dyadic event history analysis*），我应用*MSF*阐明印度节能建筑规范（*ECBC*）的有限扩散。本研究所用数据整理自官方统计、精英访谈、新闻报道、政策文件以及二次文献。尽管定性分析显示，当一名政策企业家对外部影响和先前别处的政策采纳加以利用，以期开发机会窗、并将邦内的问题、政策、政治相结合时，安得拉邦便出现了政策转移，但配对分析证明，问题、政策、政治三者的结构特征的交互作用影响了政策扩散。我的结论提出了该研究对政策扩散研究和*MSF*的意义，以及研究发现对推动政策创新、实现可持续能源转型的重要性。

关键词：多源流框架, 政策扩散, 政策创新

La literatura sobre difusión de políticas ha evolucionado en silos a partir de la investigación sobre el cambio de políticas, aunque los dos están estrechamente relacionados entre sí. Abordo esta dicotomía conceptualizando la transferencia de políticas y la difusión de políticas

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utilizando el marco de múltiples corrientes (MSF) y desarrollando hipótesis para conectarlas. Aplico este marco teórico para explicar la difusión limitada del código de construcción de conservación de energía (ECBC) en la India al combinar un proceso de adopción de políticas en el caso integrado de Andhra Pradesh con un análisis de la historia de eventos diádicos de la difusión a nivel estatal durante 2012-18. Los datos para este estudio se recopilan de estadísticas oficiales, entrevistas de élite, informes de noticias, documentos de políticas y literatura secundaria. Si bien el análisis cualitativo muestra que la transferencia de políticas a Andhra Pradesh ocurrió cuando un emprendedor de políticas utilizó la influencia externa y la adopción previa en otro lugar para explotar una ventana de oportunidad y un problema de pareja, política y política en el estado, el análisis diádico demuestra que la difusión de políticas estuvo influenciada por la interacción entre las características estructurales del problema, la política y la política. Concluyo con las implicaciones para la investigación sobre la difusión de políticas y la MSF, así como la relevancia de los hallazgos para promover la innovación de políticas para una transición energética sostenible.

PALABRAS CLAVE: Marco de múltiples corrientes, difusión de políticas, innovación de políticas

1. Introduction

Although a better understanding of how to catalyze policy diffusion can help upscale policy innovations for sustainability, the literature on policy diffusion has, ironically, shed little light on the mechanisms of diffusion (Graham, Shipan, & Volden, 2013). Scholars have suggested that issues besetting this field include: (i) incoherence between conceptualization and operationalization (Maggetti & Gilardi, 2016); (ii) lack of integration between structure and agency (Graham et al., 2013; Marsh & Sharman, 2009); and (iii) a predominant focus on diffusion at the policy adoption stage, with hardly any research on how diffusion can affect agenda dynamics (Gilardi, 2016). However, a more fundamental problem is the relative neglect of the literature on policy change in the scholarship on policy diffusion, even though the two are closely related (Karch, 2007). An integration of the two is, therefore, the first step towards a systematic path for studying when, where, why, and how policy diffusion is likely to affect policymaking, and when it is not.

To do so, I conceptualize the process of policy diffusion using the multiple streams framework (MSF)— which was initially proposed to explain agenda dynamics (Kingdon, 1995)—but has subsequently been employed to examine policy adoption and implementation as well (Fowler, 2020; Ridde, 2009; Zahariadis, 2003). Previously, an expected utility model and the punctuated equilibrium theory have been used to integrate policy change and policy diffusion conceptually (Boushey, 2012; Braun & Gilardi, 2006). In comparison, the MSF is a more compelling choice as it can uncover the influence (and interaction) of structure, agency, and chance during policy diffusion and, consequently, also indicate when and where policy entrepreneurship might help accelerate the process. Further, the MSF can extend the application of policy diffusion to other stages of the policy process, including agenda-setting and policy implementation. The MSF, in turn, can be enriched by conceptual integration with

policy diffusion as the latter incorporates the influence of interdependence on policymaking,[1.] which has rarely been acknowledged—or correctly operationalized—in research based on the framework (Brunner, 2008; Cairney, 2009; Lovell, 2016).

I apply this conceptualization, qualitatively and quantitatively, to explain the low adoption of building energy code in India. Building energy code is among the most important regulatory tools for enhancing energy efficiency (Dhaka, Mathur, & Garg, 2012; Lucon et al., 2014; Yu et al., 2017) and, thereby, reducing greenhouse gas emissions (Graham & Rawal, 2019; Yu et al., 2018). Although the energy conservation building code (ECBC)—the Indian version of building energy code—was adopted by the union government in 2007, compliance remains voluntary until respective state governments amend and adopt the code. However, action at the state level has been slow; a better understanding of the diffusion of the ECBC in India can help upscale this policy innovation and promote sustainability.

This article is structured as follows. In Section 2, I present the theoretical framework and develop hypotheses. Subsequently, I describe the governance of the ECBC in India (Section 3). Section 4 presents the data sources and research methods for this study. In Section 5, I explain the findings of the qualitative and quantitative analyses. Finally, I discuss the implications and conclude the study (Section 6).

2. Theoretical Framework

2.1. Policy Diffusion and Policy Transfer

For this study, policy diffusion can be defined as the process by which policy activity in one jurisdiction is systematically conditioned by prior policy adoption in another (Simmons, Dobbin, & Garrett, 2006), be it hierarchically similar or different (Karch, 2012; Shipan & Volden, 2006). Broadly, four "mechanisms" through which policy adoption in a "sending" jurisdiction (hereafter, sender) can influence that in a "receiving" jurisdiction (hereafter, receiver) have been identified: learning, socialization, competition, coercion (Dobbin et al., 2007; Graham et al., 2013; Maggetti & Gilardi, 2016; Shipan & Volden, 2008).

In case of the learning mechanism, the receiver draws lessons if the policy is successful in the sender (Gilardi, 2010; Meseguer, 2006; Volden, 2006; Volden, Ting, & Carpenter, 2008). In contrast, socialization is said to occur when the receiver is influenced by socially constructed characteristics of the policy—and not its economic or political rationality—in the sender (Checkel, 2005; DiMaggio & Powell, 1983; Greenhill, 2010). Separately, competition is triggered when the receiver is concerned about how policy adoption in the sender will affect its own resources, for example, through changes in environmental, investment, tax, or trade reform (Basinger & Hallerberg, 2004; Elkins, Guzman, & Simmons, 2006; Simmons & Elkins, 2004; Vogel, 1995; Volden, 2002). Finally, in case of the coercion mechanism, a sender aims to impose a policy on the receiver, for example, through conditionalities, incentives, or sanctions (Allen, Pettus, & Haider-Markel, 2004; Karch, 2006). Multiple mechanisms can operate simultaneously, not only in the diffusion network but also within the sender-receiver dyad.

Closely related to policy diffusion, the concept of policy transfer is defined as the process by which knowledge regarding ideas, institutions, and policies in the sender is employed in policymaking in the receiver (Dolowitz & Marsh, 2000). While the early literature on the topic focused on government-to-government transfer, subsequent research has recognized the more widespread movement of policies around the world (Lovell, 2016). In this scholarship, too, several mechanisms have been identified ranging from "rational" lesson drawing (Rose, 1991) to imitation (Radaelli, 2000) and coercion (Dolowitz & Marsh, 2000), resulting in a spectrum from conceptual to instrumental, symbolic, and non-transfer (Strebel & Widmer, 2012). In contrast to the research on policy diffusion, which has generally focused on analyzing the timing of policy adoption using pattern matching at the macro-level, studies on policy transfer have focused on examining the change in policy substance using process tracing at the micro-level (Dolowitz & Marsh, 1996). Consequently, "the diffusion literature privileges structure, while the transfer literature privileges agency" (Marsh & Sharman, 2009, p. 269).

Although some scholars have suggested that a combination, if not a synthesis, of diffusion and transfer analysis is necessary to provide a "full explanation" of the phenomenon (Graham et al., 2013; Marsh & Sharman, 2009; Paterson, Hoffmann, Betsill, & Bernstein, 2014), a more fundamental issue is the lack of a theoretical framework unifying policy diffusion and policy transfer with policy change. Ultimately, "diffusion is but a part of the larger process of adoption, albeit a very important and interesting one" (Karch, 2007, p. 56). While an expected-utility model of policy change (Braun & Gilardi, 2006) and the punctuated equilibrium theory (Boushey, 2012) have been employed previously to build a theoretical foundation for policy diffusion, these also emphasize structure over the agency. A better approach to capture the interaction of structure, agency, and contingency in the process is provided by Cairney (2009) and Lovell (2016), who synthesize—albeit partially—the MSF with the notion of policy transfer. I develop this insight further by conceptualizing policy transfer, and policy diffusion, using the MSF.

2.2. The Multiple Streams Framework

Adapted from the garbage can model of organizational choice (Cohen, March, & Olsen, 1972), the MSF depicted agenda-setting as an interplay of three relatively independent streams: problem, policy, and politics (Kingdon, 1995). The problem stream represents perceptions of societal circumstances based on indicators, "focusing events," and feedback that create a necessary but insufficient condition for policy change. The policy stream captures the evolution of policy alternatives based on criteria such as financial viability, normative appeal, public acceptability, and technical feasibility. Distinct from these two, the politics stream reflects factors such as administrative or political turnover, party ideologies, and interest groups. Kingdon (1995, p. 122) posited that an issue was placed on the policy agenda when, during windows of opportunity, the three streams were "coupled" by policy entrepreneurs—actors who were willing to "invest their resources – time, energy, reputation,

and sometimes money in the hope of a future return"—to push their pet policy proposal forward.

Since then, the MSF has witnessed significant theoretical development and it has also been applied to other stages of the policy process, including policy adoption and implementation (Fowler, 2020; Ridde, 2009; Zahariadis, 2003). In the process, however, several variants of the MSF have emerged. Illustratively, while Zahariadis (1992) did not demarcate the decision-making stage from agenda-setting stage in his application of the MSF, Herweg, Huß, and Zohlnhöfer (2015) differentiated windows of opportunity and policy entrepreneurship between one stage and the next, and Howlett, McConnell, & Perl (2015) introduced a process stream and a program stream to account for additional activities involved beyond agenda-setting. In this study, following Zahariadis (1992), I use the three-stream formulation of the MSF and collapse the distinction between the agenda-setting and decision making.

2.3. Conceptualizing Policy Transfer and Policy Diffusion Using the Multiple Streams Framework

In an interdependent setting, external influence due to prior policy activity in a sender and/or a trans-jurisdictional actor can systematically influence each policy-making stream of the receiver.

First, the problem stream of the receiver can be altered through policy diffusion in several ways. Policy adoption in a jurisdiction can create externalities that influence, or are anticipated to influence, the underlying societal conditions in another jurisdiction—for instance, by threatening economic or environmental leadership of the latter (Walker, 1969; Wiener & Koontz, 2010)—as highlighted by the competition mechanism in the diffusion literature. Even when it does not alter material conditions, external policy activity can still affect problem framing through the creation and diffusion of new indicators. Illustratively, the OECD developed a Better Life Index to influence how countries measured well-being by proposing an alternative to the gross domestic product (GDP; Bache & Reardon, 2013).

Further, policy adoption in a sender can also directly influence issue definition in a receiver. Gilardi, Shipan, and Wüest (2020), for example, found that the way a problem was framed changed as policies spread within a diffusion network and their practical implications were better understood. Moreover, external or trans-jurisdictional actors can play a key role in this process. For instance, Davies and True (2017) found that a British official was instrumental in the international spread of sexual violence in conflict as a problem frame, while Haas (1992) showed that epistemic communities contributed to the diffusion of issue awareness in areas such as climate change (see, also, Mukherjee & Howlett, 2015).

Hypothesis 1: If external policy activity changes underlying societal conditions and/or influences the problem definition, the problem stream is more likely to be ripe for coupling.

Second, prior policy adoption in another jurisdiction can influence the policy stream in the receiver. Fundamentally, external policy activity might create new policy alternatives that can then circulate globally (Baker & Walker, 2019), possibly even for application to a different policy objective (Steinbacher, 2015). Policy adoption elsewhere can also influence the policy stream through a shift in policy attention even if the policy instrument has been in circulation for a while (Boushey, 2012). In either case, policy communities in the receiver might then monitor policy activity in another jurisdiction to learn more about appropriateness or the success of the policy in the sender, as highlighted by the socialization or the learning mechanism in diffusion studies (Dobbin et al., 2007; Weyland, 2009). Lovell (2016), for example, found that policy communities in Australia were attentive to the international circulation of smart metering policy and sought to draw lessons from its implementation elsewhere.

So long as a policy change in the sender is observable (van der Heiden & Strebel, 2012), this process can inform an assessment of criteria such as technical feasibility, normative appeal, and public acceptability (Burns, Krott, Sayadyan, & Giessen, 2017; Jones & Newburn, 2005) and influence the survival of ideas in the receiver. Further, coercion—for example, through incentives, conditionalities, or sanctions (Dobbin et al., 2007)—can also affect the financial viability of an alternative in the policy stream. The strength of this influence, however, is likely to be determined by the characteristics of the receiver—such as the prevailing policy mix or institutional environment (Gilardi, Füglister, & Luyet, 2009; Howlett & Rayner, 2008; Obinger, Schmitt, & Starke, 2013)—characteristics of the sender—such as its reputation (Minkman, van Buuren, & Bekkers, 2018)—and their similarities, such as the presence of common implementation environment (Nicholson-Crotty & Carley, 2016) or prior cooperation (Kammerer & Namhata, 2018).

This external influence on the policy stream can be mediated by several actors. Knowledge brokers, for instance, can contribute to the development of the policy stream by providing a template in the form of a policy kernel (Koski, 2010). Further, through elite networking (Jones & Newburn, 2002) and "infiltration" (Bennett, 1991), transnational policy communities can play a more active role in alternatives specification (Ayana, Arts, & Wiersum, 2018; Bache & Reardon, 2013; den Besten, Arts, & Behagel, 2019; Diprose, Kurniawan, & Macdonald, 2019). Illustratively, instrument constituencies—a special type of transnational policy community—have been found to contribute to policy diffusion through a combination of model building, prototyping, and implementation support (Béland, Foli, Howlett, Ramesh, & Woo, 2018; Howlett, Ramesh, & Saguin, 2018; Saguin & Howlett, 2019; Voß & Simons, 2014).

Hypothesis 2: If another jurisdiction has adopted a policy successfully, the policy stream is more likely to be ripe for coupling.

Third, policy adoption in a sender can also affect the characteristics of the politics stream in the receiver in several ways. For instance, public mood might change based on not only internal dynamics but also on external dynamics. Cairney (2009) found this to be true in case of tobacco policy in the United Kingdom, wherein a

tobacco ban in Ireland mobilized the public against tobacco even in England, resulting in new support for anti-tobacco legislation by a Labor Member of Parliament. Further, external policy adoption can be used instrumentally by interest groups to advocate for their policy preferences. Harrinkari, Katila, and Karppinen (2017), for example, found that an environmental coalition in Finland used international forestry regulation to legitimize their position in the Finnish forest policy debate. Moreover, policy adoption in another jurisdiction might also influence the power distribution in the receiver, either reinforcing the authority of the dominant coalition or contributing to the emergence of new actors in the subsystem (Ramcilovic-Suominen, Lovric, & Mustalahti, 2019).

Even when it does not alter the immediate political context, policy adoption elsewhere can change the strategic calculus in policymaking. External policy activity might affect the political salience of an issue—for example, through coercion or suasion (Dobbin et al., 2007; Shipan & Volden, 2008)—thereby, creating an expectation on the government and opening a window of opportunity in the politics stream. Karch (2012) found this to occur in case of science policy in the United States, wherein national debate over the Stem Cell Research Enhancement Act increased the likelihood of introduction of similar legislation at the state-level. Further, information on the consequences of a policy can influence the willingness of governments to act, although the nature and strength of this influence are contingent on the existing political dynamics. Illustratively, Gilardi (2010) showed that, in case of an unemployment policy in OECD countries, right-wing governments were more likely to emulate the policy when it was viewed as contributing to electoral success, thus demonstrating higher willingness to act based on external influence on the politics stream. In case of both horizontal or vertical policy diffusion, external influence on the politics stream is likely to be mediated by actors such as (common or ideologically similar) political parties (Butler, Volden, Dynes, & Shor, 2017), interest groups (Barrilleaux, Garrett, & Jansa, 2015), or political coalitions (Meckling, 2011).

> *Hypothesis 3: If external policy activity raises the expectation on the government to take a decision and/or increases its willingness to do so, the politics stream is more likely to be ripe for coupling.*

The potential effect of interdependence on policymaking is depicted in Figure 1. As discussed above, policy activity in a sending jurisdiction, say jurisdiction S, can influence the problem stream (pathway A), the policy stream (pathway B), and/or the politics stream (pathway C) in a receiving jurisdiction, say jurisdictions R_1 and R_2. At the micro-level, a multiple streams approach suggests that it is necessary but not sufficient for policy activity in a sender to influence one or more streams in the receiver for policy transfer to occur. Whether such influence results in a policy transfer to the receiver is contingent upon the prior characteristics of the streams, the effect of the influence on the alignment of the three streams, and the presence (and ability) of policy entrepreneurs to exploit external influence during windows of opportunity and couple the streams. Further, during this process, the policy might not be transferred in its original form and alternatives might undergo "mutations" or

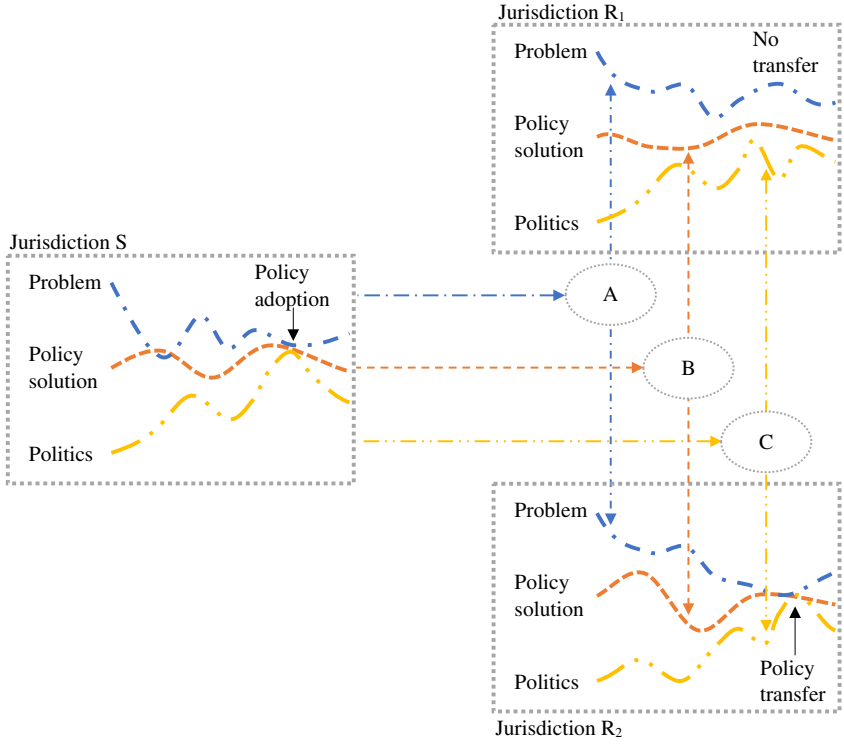

Figure 1. A Conceptualization of Policy Transfer and Policy Diffusion Using the Multiple Streams Framework. The streams in the different jurisdictions are considered as being interdependent. Policy adoption in a sending jurisdiction (S) can influence the problem stream (pathway A), the policy stream (pathway B), and/or the politics stream (pathway C) in a receiving jurisdiction (R_1 and R_2). A policy transfer is more likely to occurs when the influence is exploited by a policy entrepreneur to couple the three streams during a window of opportunity in a receiving jurisdiction (R_2) and not otherwise (R_1).

"recombinations" as they evolve through assemblage and translation (Gulbrandsen, Sammut, & Wettestad, 2017; Minkman et al., 2018; Stone, 2012; Vasseur, 2014).

Hypothesis 4: In the presence of external policy activity, a policy transfer is more likely when the three streams are ripe, a window of opportunity is present, and a policy entrepreneur couples the streams leading to policy adoption.

At the macro-level, the patterns of diffusion emerge based on the interaction between external policy activity and domestic policymaking across multiple jurisdictions over time. It should, therefore, be no surprise that characteristics of the three streams, such as problem severity (Daley & Garand, 2005), availability of a base policy (Koski, 2010), the political situation (Minkman et al., 2018) or the timing of elections (Walker, 1969) are associated with the rate of diffusion. Further, even policy entrepreneurship has been found to play an important role in policy diffusion (Mintrom, 1997; Mintrom & Vergari, 1998). Consequently, one can formulate the following hypothesis.

Hypothesis 5: The structural characteristics of the streams in the receiver influence the extent of policy diffusion and should explain – at least partially – why some jurisdictions emulate the policy even as others do not.

3. The Energy Conservation Building Code in India

Energy is categorized as a "concurrent" subject in the Constitution of India: while the union government has the authority of executive and legislative decision making on energy generation and inter-state transmission, the state governments have authority over generation, intra-state transmission, and distribution. As a result, states have significant leeway in energy planning, policy adoption and implementation, and monitoring and evaluation. Even as this polycentric system creates opportunities for experimentation and learning, it requires the consideration of wide socio-economic disparities—which manifest in significant heterogeneities in energy demand and supply, the existing policy environment, and the political context—in upscaling policy innovation (Chindarkar & Goyal, 2019; Ministry of New & Renewable Energy, 2018).

In 2001, India enacted legislation to emphasize energy conservation and reduce the energy intensity of the economy (Ministry of Power, 2019). Subsequently, the Bureau of Energy Efficiency (BEE)—a union government agency—was set up to facilitate the formulation and implementation of energy efficiency measures through market transformation and self-regulation (Bureau of Energy Efficiency, 2019a). The BEE fulfills its objectives by soliciting the active participation of various stakeholders across a range of energy-intensive consumption sectors, including residential and commercial buildings. The authority to adopt and implement measures formulated through this process, however, lies with state governments and their designated agencies that coordinate with the BEE. At the state-level, energy efficiency has received lower policy priority. Illustratively, a recent assessment of energy efficiency preparedness in the country found that only three states scored more than 50 percent and nearly half scored less than 30 percent (AEEE & BEE, 2019).

The situation is the same even in case of building energy code, a regulatory tool for reducing the energy footprint of residential and commercial buildings. In 2007, the BEE developed the ECBC, which specifies design-time requirements for the building envelope; lighting; heating, ventilation, and air conditioning; electrical system; and water pumping and heating (Bureau of Energy Efficiency, 2007). Private buildings, however, were not required to comply with the code due to its voluntary status; the BEE cannot mandate the adoption or the implementation of the code (Khosla, 2016). To make the ECBC mandatory, a three-step process is required at the state level. First, a state-level agency must customize the code—in consultation with the BEE—depending on the regional climate and implementation context (Bureau of Energy Efficiency, 2019b). Second, the state government must adopt the policy (a process known as "notification"). Third, the code should then be incorporated into building regulation by urban authorities within the state.

While all state governments have begun the process of the amendment of the ECBC, its adoption has been slow. As shown in Supplementary Information (SI):

Table S1, over a decade after the code was formulated, only 10 states and one union territory (out of 36) had adopted the code. A better understanding of the dynamics that have facilitated, or hindered, the state-level adoption of the ECBC in India can shed light on where, when, and how policy diffusion can be catalyzed.

4. Research Methods

I used a mixed methods design to test hypotheses *H1-H5* using the case of the diffusion of the ECBC in India.

4.1. Process Tracing

As is common in the research on policy transfer, process tracing was used to examine the adoption of the ECBC in an embedded case and test hypotheses *H1-H4* qualitatively. The state of Andhra Pradesh was sampled purposively for this study. First, as the fifth jurisdiction in India to adopt the ECBC, Andhra Pradesh served as both a potential receiver and a potential sender. Thus, the case enables one to test whether external influence affected policymaking in Andhra Pradesh, that is, whether any transfer occurred. Second, access to the policy-making community—a key source of information for process tracing—was highlighted by experts in India as a factor for selecting Andhra Pradesh. Third, as a case of success, the process of ECBC adoption in Andhra Pradesh has high policy relevance for the further diffusion of the code in India (Khosla, 2016).

The data for the process trace were obtained through multiple sources. I conducted 13 interviews in Delhi, Gujarat, and Andhra Pradesh in 2018 to understand the factors that facilitate or inhibit the adoption of the ECBC, the roles of different actors in the process, and the influence of prior policy activity on policymaking in Andhra Pradesh. These data were triangulated using policy documents, obtained under the Right to Information (RTI) Act 2005 or available publicly, and secondary literature. In addition, I parsed through over 500 news reports in the Lexis Academic database pertaining to the ECBC.

4.2. Dyadic Analysis

I employed dyadic event history analysis, a common technique in the policy diffusion literature, to examine the patterns of adoption of the ECBC within India during 2012-18 and test hypothesis *H5*. In a dyadic approach, the unit of analysis is not a state, but a state pair consisting of a potential sender (a state that has already adopted the policy) and a potential receiver (a state that is yet to adopt the policy) in each year. To differentiate between policy transfer and policy diffusion in the empirics, I use the term policy emulation—defined as "a situation in which a state [jurisdiction] intentionally changes its policy in a way to more closely conform with existing policy in another state [jurisdiction]" (Boehmke, 2009, p. 1126)—to refer to the macro-level dyadic analysis. Since *actual* policy emulation is difficult to observe,

as per the standard practice in policy diffusion studies, the dependent variable was coded as 1 when a potential receiver adopted the ECBC after it had already been adopted in a potential sender, thereby *implying* the emulation of the potential sender by the potential receiver (Gilardi & Füglister, 2008).

While numerous characteristics of the problem, policy, and politics streams might influence policy emulation, I included variables in the analysis based on literature review, elite interviews, and data availability. In the problem stream, I modeled three characteristics of the receiver that indicate problem severity or policy opportunity for energy conservation: (i) the percentage of value-added by construction in the state GDP as an indicator of the likely growth of real estate in the state; (ii) the percentage of electricity consumption in the commercial category, the primary form of energy used in buildings in India (Yu et al., 2018); and (iii) the average annual energy deficit, or the gap between anticipated demand and actual electricity supplied by electricity distribution utilities, which could influence state-level decision making (Jogesh & Dubash, 2015).

In the policy stream, two "internal" characteristics that proxy financial viability and public acceptability were incorporated: (i) tax revenue as a percentage of the state GDP as a measure of the fiscal capacity of the state to enforce the code (Nelson, 2012); and (ii) per capita income—in the log form—as an indicator of the ability or willingness of the citizens to pay a higher price for energy-efficient buildings (Chandler, 2009; Cia Alves, Steiner, de Almeida Medeiros, & da Silva, 2019; Nelson, 2012; Stadelmann & Castro, 2014; Yi, Feiock, & Berry, 2017). In addition, I included five control variables which capture dyadic similarities that might influence the policy stream of the receiver: (i) whether the states share a common border (Chandler, 2009; Mooney, 2001; Stoutenborough & Beverlin, 2008); (ii) whether the states are part of the same regional electricity grid; (iii) absolute difference in electricity supply; (iv) absolute difference in the log of GDP; and (v) absolute difference in the log of population.

Finally, in the politics stream, I included two characteristics of the receiver that might influence decision making: (i) time elapsed since the previous legislative assembly election in the state, with the expectation that a government is more likely to adopt a new policy soon after entering office rather than later in its term (Walker, 1969); and (ii) the governing party or coalition, as a proxy for party ideology (Bromley-Trujillo, Butler, Poe, & Davis, 2016; Cia Alves et al., 2019; Matisoff & Edwards, 2014). Additionally, a dyadic similarity in the form of a common political party governing the states was incorporated (Chandler, 2009) as it might mediate the influence on the politics stream (Butler et al., 2017). The variables included in the analysis and their data sources are summarized in Table 1.

The final sample consisted of data on 31 jurisdictions that have a legislative assembly and an elected government (hereafter, states; see SI: Table S2). To address simultaneity bias (Nelson, 2012), I used the lag of all variables in the problem and policy streams. Further, to reduce convergence bias and condition the analysis on the opportunity to emulate (Boehmke, 2009), I dropped observations for which the potential sender has not adopted the policy or the potential receiver has already adopted the policy (see SI: Table S7 for a regression of the full sample). Therefore, the

Table 1. Variables Included in the Analysis and Their Data Sources

Variable	Description	Data Source
$ECBC_r$	Whether the state has adopted building energy code (1 = yes)	RTI
$Emulation_{r,s}$	Whether policy in $state_r$ seemed to emulate policy in $state_s$	Calculated
Problem stream		
$Cons_r$	Value-added of construction in the gross domestic product (%)	RBI
$Comm_r$	Electricity consumption in the commercial category (% of total)	Indiastat; PFCL
Def_r	Average electricity deficit (%)	Indiastat; CEA
Policy stream		
Tax_r	Tax revenue as a share of gross domestic product (%)	RBI
Inc_r	Log_2 of per capita net domestic product in thousand INR	RBI
$Bord_{r,s}$	Whether states share a common border (1 = yes)	Survey of India
$Reg_{r,s}$	Whether states belong to the same region (1 = yes)	Calculated
$Elc_{\lvert r\text{-}s \rvert}$	Absolute difference in electricity supply (Billion-kilowatt hour)	RBI
$GDP_{\lvert r\text{-}s \rvert}$	Absolute difference in log of gross domestic product in Billion INR	RBI
$Pop_{\lvert r\text{-}s \rvert}$	Absolute difference in the log of population (Million)	RBI*
Politics stream		
Ele_r	Time since the last election (years)	ECI
Pol_r	Political party or coalition in government (1 = NDA; 2 = UPA; 3 = Oth)	Indiavotes; news articles
$Gov_{r,s}$	Whether states are governed by a common party (1 = yes)	Calculated

CEA: Central Electricity Authority, Ministry of Power, Government of India; ECI: Election Commission of India; INR: Indian Rupees; NDA: National Democratic Alliance; Oth: Other party or coalition in government; PFCL: Power Finance Corporation of India Limited; RBI: Reserve Bank of India; RTI: Right to Information Act, 2005; UPA: United Progressive Alliance. All time-related variables are coded based on financial year (FY), that is, from April to March.
*Data on the population of Andhra Pradesh and Telangana on bifurcation were collected from respective government websites.

dyadic analysis started in FY 2012, when the first state-level adoption of the ECBC occurred.

A random effects specification was used due to lack of temporal variation in characteristics for most dyads in the sample. A linear time-trend was included for the main specification, while a cubic spline was included as a robustness check. The model was estimated using panel data logistic regression with standard errors clustered at the dyad level. The analysis was run using STATA software (version STATA/SE 14.1; StataCorp LP, College Station, TX, USA).

5. Findings

5.1. The Adoption of the Energy Conservation Building Code in Andhra Pradesh

In January 2014, Andhra Pradesh became the fifth jurisdiction in the country to adopt the ECBC and mandate it for commercial buildings above a certain size (Chakraborty, 2014). In this process, external influence and trans-jurisdictional actors

played a key role in influencing agenda dynamics and decision making through the policy stream and—albeit to a lesser extent—even the problem stream and the politics stream.

The Problem Stream. Since the liberalization of its economy in 1991, India witnessed rapid development, electrification, and urbanization. This resulted in a steady rise in residential and commercial buildings in the country, which was expected to persist and increase their energy demand several-fold till 2050 (Khosla & Janda, 2019; Yu et al., 2018). Much like the rest of India, Andhra Pradesh witnessed a construction boom at the beginning of this century. Real estate development, a key component of its economic growth, increased fivefold between 2005 and 2010 (NRDC, 2012). Hyderabad, the capital of Andhra Pradesh, was developing especially rapidly into an innovation and technology hub and accounted for a large share of the new real estate in the state (Khosla, 2016). This created a policy opportunity for reducing the energy footprint of buildings during the design phase.

While the BEE created awareness about the potential for energy conservation through numerous forums (United News of India, 2008), national policy objectives for promoting energy efficiency—reducing the energy intensity of the economy, addressing the international pressure to mitigate greenhouse gas emissions, and enhancing energy security—had little resonance at the state level (Jogesh & Dubash, 2015). Around the time, electricity distribution—a state-level responsibility—was also under stress with demand constantly exceeding supply almost throughout the country (CEA, 2008, 2013). The BEE framed the problem by highlighting that the country was "heading towards a situation where [it] can face severe net energy deficiency as well as sky-rocketing prices … [it is] literally on the razor's edge" (SME Times, 2011, p. para. 2). In its interactions with the states, it urged them to undertake a concerted effort toward energy efficiency.

This issue frame diffused to Andhra Pradesh and facilitated the ripening of the problem stream when the state faced an unprecedented energy crisis. In 2012, the average electricity deficit and the peak electricity deficit of the state increased to over 15 percent from about 7 percent in the previous year (CEA, 2010, 2011). Although the crisis was primarily driven by fuel shortage (Celestine & Sukumar, 2013; The Hindu Business Line, 2011), it created a window of opportunity for promoting energy efficiency in the state (R. Bilolikar, personal communication, July 30, 2018). The head of the Andhra Pradesh urban development department, for example, argued: "It is the need of the hour … unless we have energy efficiency the power crisis will not be addressed and development will be stunted" (Targeted News Service, 2012, para. 9).

The Policy Stream. The BEE played an active role in the policy stream nationally by developing a policy kernel, that is, a base policy, through intensive research and consultation effort (US Fed News, 2007). In addition, in collaboration with the United States Agency for International Development, it created "tip sheets" and a "technology atlas" to support engineers, architects, builders, and energy efficiency practitioners in their effort to comply with the building code (US Fed News, 2008). However, state-level policy entrepreneurship was necessary for moving the code toward implementation. Even though the BEE promised financing for energy

efficiency initiatives at the state-level, few states utilized these opportunities (S. Seth, personal communication, July 14, 2018).

The first, and key, influence of interdependence on the policy stream was through the presence of a transnational, collective policy entrepreneur. In August 2010, when no state in India had adopted the ECBC, the Administrative Staff College of India (ASCI), the Indian Institute of Information Technology (IIIT) Hyderabad, and the Natural Resources Defense Council (NRDC) created a consortium to develop a roadmap for ECBC implementation in Andhra Pradesh (V. Garg, personal communication, 30 July 2018). While ASCI—a think tank and training institute based in Hyderabad—enjoyed a close working relationship with the state government, IIIT Hyderabad had technical expertise on the ECBC, and NRDC brought international experience with building energy codes to the consortium. This consortium of ASCI, IIIT Hyderabad, and NRDC played the role of the policy entrepreneur and contributed to the ripening of the policy stream. With the support of the state-level counterpart of the BEE, the consortium customized the policy idea and developed it further. First, the consortium increased technical feasibility and addresse reservations against the code through trainings and workshops (The New Indian Express, 2012). Second, it enhanced public acceptability by incorporating the demands of real estate companies—strict enforcement to ensure a level playing field, a simple compliance mechanism for speedy approval, and low compliance cost for small buildings—into the implementation roadmap (R. Bilolikar, personal communication, 30 July 2018; C. S. Reddy, personal communication, 2 August 2018). Third, it also changed the proposed applicability criterion for the code from electricity load—which is difficult to ascertain at the design stage—to building floor area. Through this effort, the consortium was ready with an implementation roadmap for the ECBC when the state faced acute energy shortage.

Policy transfer influenced the policy stream after the proposal was on the agenda too. First, the policy community drew lessons from the state of Rajasthan, which had adopted the code in 2012, while formulating the policy. For instance, Rajasthan had included the detailed code as part of its executive order. However, as passing another executive order to amend the code is bureaucratic and time-consuming, this approach made a future revision of the code challenging. To avoid this situation and retain design flexibility, the state of Andhra Pradesh separated the content of the code and referenced it in the executive order declaring policy adoption (V. Garg, personal communication, 30 July 2018). Second, the state also drew lessons for the implementation compliance framework from the international experience with building energy codes. While in a country such as the US, code compliance is typically verified by public agencies, a major challenge in India was the lack of capacity—and the associated risk of corruption—in urban local bodies for assessing code compliance (S. Kumar, personal communication, 13 July 2018). The same issue was addressed in China, for example, by involving certified private entities in plan review and onsite inspection (Yu, Evans, Kumar, Van Wie, & Bhatt, 2013). This mechanism of third-party assessment—for plan approval and periodic auditing by an authorized private verifier—was "borrowed" by the policy community in Andhra

Pradesh to strengthen the implementation of the code and facilitate speedy regulation (V. Garg, personal communication, 30 July 2018).

The Politics Stream. With a draft of the implementation roadmap complete, the policy entrepreneur approached Ms. Minnie Matthew, the head of the bureaucracy in Andhra Pradesh, to push the code forward. The high electricity deficit in the state had created a window of opportunity and the bureaucracy was receptive to their proposal (R. Bilolikar, personal communication, 30 July 2018). Moreover, due to the low political salience of the ECBC, the bureaucracy was able to convince the political leadership of the need for the policy: "… the political leadership is very astute … so long they think it's vote neutral and for [the] public good, there will be support" (S. K. Joshi, personal communication, 31 July 2018). Consequently, the ECBC was placed on the policy agenda in Andhra Pradesh. As part of a concerted push on energy efficiency, the government directed the creation of a high-level committee to oversee the amendment and adoption of the code (The Times of India, 2012a; United News of India, 2013).

The deliberations of the high-level committee involved bringing relevant government agencies and departments on board, tailoring the code as per requirement, and creating a compliance framework. An anticipated challenge with the adoption and implementation of the code—the lack of support from the urban development department—was addressed by appointing Dr. S. K. Joshi, head of the urban development department at the time, as the chair of this high-level committee. He steered the process and facilitated coordination between different agencies and stakeholders. Further, the appointment of the head of ASCI as the convener of the committee (The Times of India, 2012b) ensured that the policy and politics streams remained coupled during policy formulation. Through ASCI, the transnational consortium was able to highlight the value addition of the code in comparison to existing building regulation and present various design alternatives for the consideration of the committee.

During the process of policy adoption, policy diffusion influenced the politics stream as well. The bureaucratic process of policy adoption was more contested than agenda-setting. Some stakeholders—both within and outside the government—challenged the necessity and the feasibility of the code. As the states of Odisha and Rajasthan had adopted the ECBC by then, the policy entrepreneur highlighted this precedent in urging the Andhra Pradesh government to follow suit (V. Garg, personal communication, 30 July 2018). Dr. S. K. Joshi (personal communication, 31 July 2018) remarked: "… in government … first thing is to know whether there is any precedent. What is your neighbor doing?" Further, a senior energy bureaucrat of the bifurcated state of Andhra Pradesh (personal communication, 03 August 2018) alluded to the influence of prior policy activity in the politics stream in general: "it [political will] is easy to change if there have been successful models elsewhere. But when you are innovating, then unless the person is open it is very difficult."

The case, therefore, supports the hypotheses *H1–H4*: policy diffusion and transfer influenced not only the policy stream, but also—to a lesser extent—the problem and the politics stream; in addition, policy adoption occurred when prior adoption

elsewhere was used by a transnational policy entrepreneur to exploit a window of opportunity and move the process forward.

5.2. The Diffusion of Energy Conservation Building Code in India

For brevity, descriptive information regarding the adoption of the ECBC in India, the dependent variable, and the characteristics of the three streams are available in SI: Tables S3–S6. The influence of the problem, policy, and politics streams on policy emulation can be seen in Table 2.

As Table 2 shows, in the problem stream, a higher share of construction in state GDP and higher average electricity deficit were both strongly associated with higher likelihood of policy emulation. While the probability of emulation increased from 2% to 12% with an increase in value-added of construction in GDP from 3% to 21%—the minimum and maximum in the sample—it increased from 3% to 19% for movement from the minimum to the maximum average electricity deficit in the sample, that is, from 0% to 25% (Figure 2). The relationship between electricity consumption in the commercial category and policy transfer was, however, weak. This might be the case as consumers in the commercial category typically cross-subsidize agricultural and residential consumers and, consequently, account for a higher share of the distribution utilities' revenues. States might, therefore, be ambivalent about seeing a high share of electricity consumption in the commercial category as a problem.

Further, the influence of modeled characteristics of the policy stream on policy emulation was the most pronounced. The predicted likelihood of emulation increased from 0% to 72% as tax revenue as a share of GDP increased from 3% to 21%. Even with an increase in the log of per capita income from its minimum value to its maximum value, the predicted probability of emulation increased from 0% to 42%. As these variables proxy the budgetary workability and public acceptability of the policy, those characteristics of the policy stream appear to have influenced the likelihood of policy emulation and the rate of policy adoption. Further, among the dyadic characteristics that might influence the policy stream in the receiver, being in the same electricity region as the sender and similarity in size of electricity distribution are found to increase the likelihood of policy emulation, while the effect of a common border, difference in GDP, and difference in population were not statistically significant. This is an indication that potential receivers prioritize similarity in technical characteristics more than that in socio-economic characteristics while considering the emulation of a potential sender.

Additionally, both the characteristics of the politics stream included in the analysis—time since the last election and the party in government in the receiving jurisdiction—also had an influence on the likelihood of policy emulation, albeit to a lesser extent than the characteristics of the problem and the policy streams. As expected, in general, more time since the previous election—and, hence, less time to the subsequent election—decreased the probability of transfer from 8% to 1%. This indicates that a window of opportunity for the adoption of the ECBC is most

Table 2. The Regression of Policy Emulation on Characteristics of the Problem, Policy, and Politics Streams

Outcome: Emulation	(1)	(2)
Problem stream		
$Cons_r$	1.18*** [1.06, 1.31]	1.10 [0.97, 1.24]
$Comm_r$	1.02 [0.94, 1.10]	1.04 [0.94, 1.14]
Def_r	1.15*** [1.04, 1.27]	1.03 [0.96, 1.10]
Policy stream		
Tax_r	1.77*** [1.47, 2.14]	2.29*** [1.60, 3.26]
Inc_r	7.07*** [4.23, 11.82]	4.11*** [2.63, 6.42]
$Bord_{r,s}$	0.63 [0.25, 1.57]	0.63 [0.23, 1.68]
$Reg_{r,s}$	2.03* [0.90, 4.58]	1.99 [0.85, 4.63]
$Elc_{\lvert r\text{-}s \rvert}$	0.98*** [0.96, 0.99]	0.98*** [0.96, 0.99]
$GDP_{\lvert r\text{-}s \rvert}$	0.80 [0.38, 1.68]	1.01 [0.45, 2.29]
$Pop_{\lvert r\text{-}s \rvert}$	1.04 [0.57, 1.91]	0.86 [0.44, 1.71]
Politics stream		
Ele_r	0.47*** [0.39, 0.56]	0.44*** [0.34, 0.57]
Pol_r (Reference = NDA)	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]
Pol_r (2 = UPA)	29.09*** [4.44, 190.57]	21.98*** [4.32, 111.88]
Pol_r (3 = Oth)	0.41 [0.07, 2.27]	0.48 [0.08, 2.92]
$Gov_{r,s}$	0.49 [0.16, 1.54]	0.56 [0.17, 1.86]
Spline with three nodes	No	Yes
N	947	788
Wald Chi^2	157.56	229.03
Log-likelihood	−81.41	−76.05

Column 1 is the main specification of this study. The coefficients are the odds ratio of outcome for a unit increase in the independent variable (for continuous variables) or in comparison to the reference category (for categorical variables). Both models include random intercepts at the dyad-level. The 95% confidence intervals are presented in brackets.
*$p < 0.10$; **$p < 0.05$; ***$p < 0.01$.

likely to exist immediately after a legislative election. Further, in the sample, a state governed by (a member party of) the UPA had a higher likelihood of policy transfer (15% in comparison to 2-3% for a state governed by a different party or coalition, indicating that party ideology also influenced the diffusion of ECBC within India. The NDA—the principal opposition of the UPA—specifically might be more reluctant to adopt the policy as it is seen as a more business-friendly party; some consider the possibility of increased bureaucratic "interference" through the ECBC to be high (Down To Earth, 2013). Also, the dyadic similarity in the governing party or coalition was not found to have a statistically significant on emulation, possibly due to the low political salience of the policy.

Moreover, as hypothesized by the MSF, the effect of the characteristics of the three streams on the probability of policy emulation was not additive but interactive. The likelihood of policy emulation was, for instance, higher when both the average electricity deficit and tax revenue as a share of the GDP were high than when either was high in isolation (Figure 3). Specifically, the likelihood of policy emulation was much higher when the average electricity deficit was above about 5 percent and tax revenue as a share of GDP was above about 12 percent. The influence of the average electricity deficit and per capita income was also interactive, and the probability of

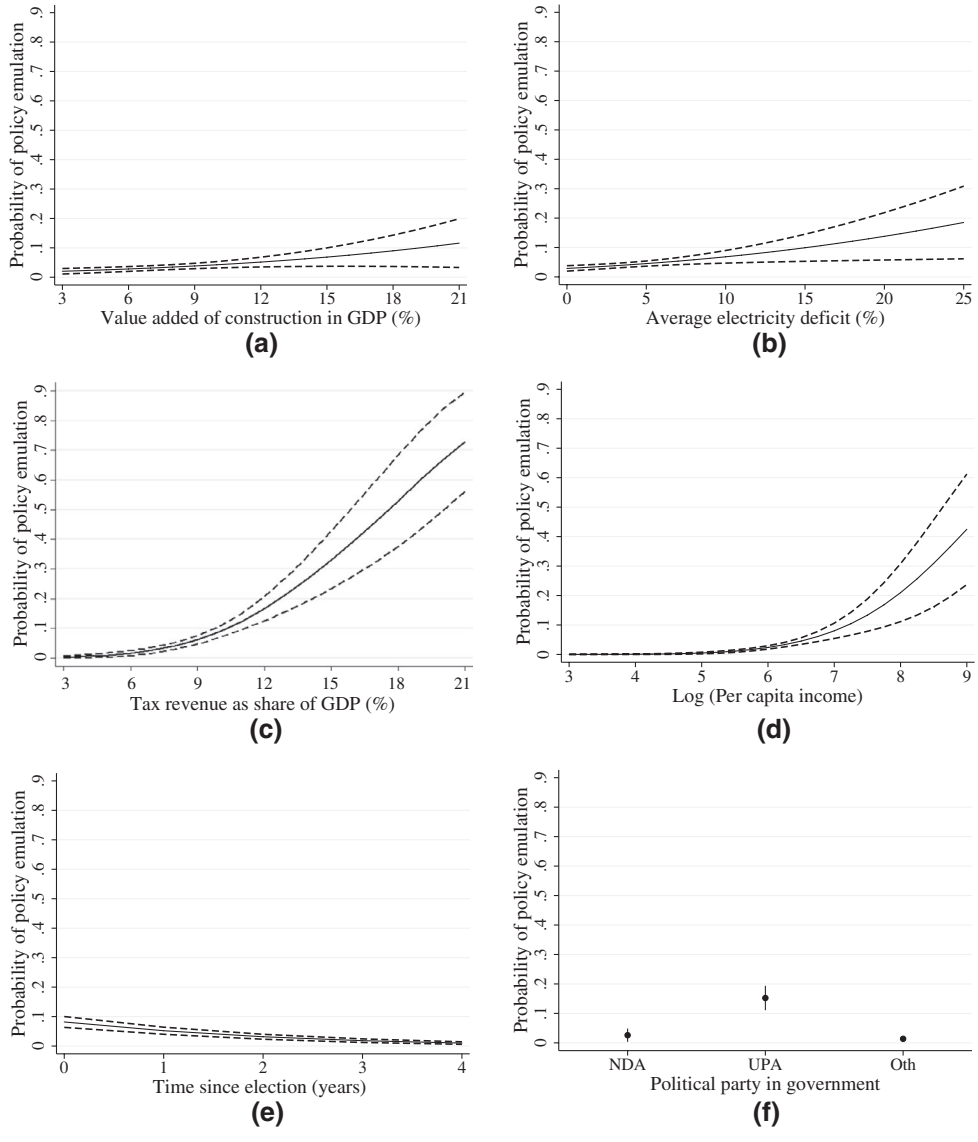

Figure 2. Predicted Probability of Policy Transfer and the 95% Confidence Interval for Characteristics of the Problem (a-b), policy (c-d), and politics streams (e-f). The figure is based on the result in Table 2, column (1).

policy emulation was higher when both were high simultaneously. The probability of policy emulation was especially low when the average electricity deficit was below about 3 per cent *or* the per capita income was below about INR 60,000 per annum. Further, in each case, the time since election affected the magnitude of the likelihood of policy emulation as well as the shape of the interaction plot. This indicates an administrative and political cost-benefit calculus in decision making on the ECBC.

Similarly, the effect of value-added of construction in the GDP and the characteristics of the policy and politics streams on predicted policy emulation were also

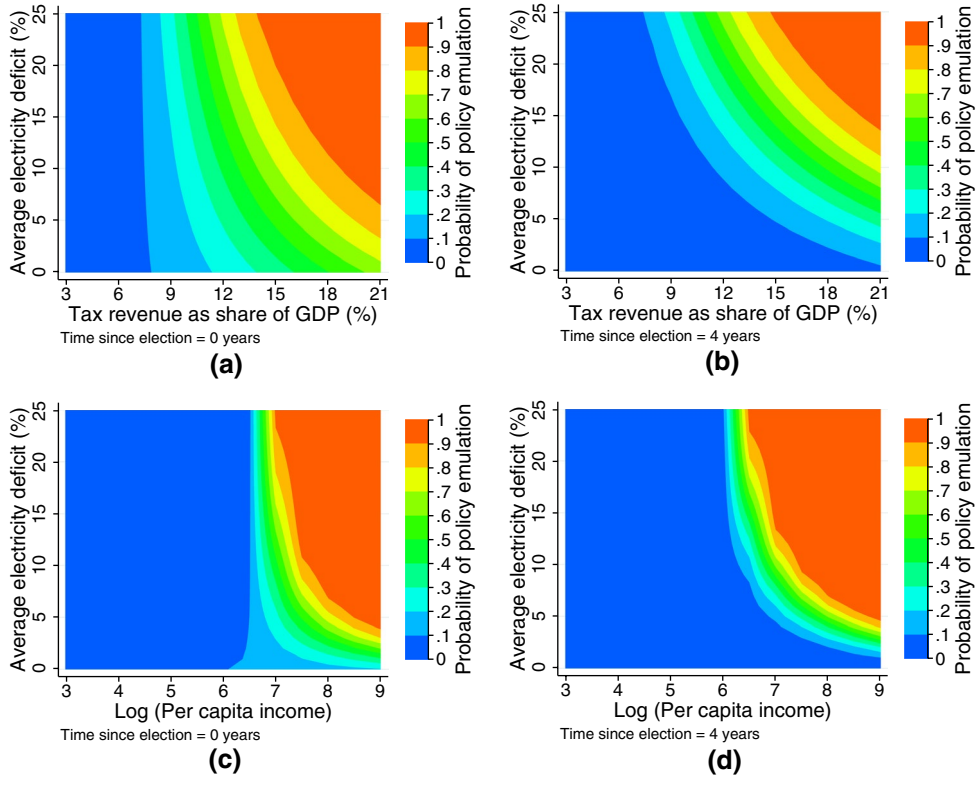

Figure 3. The Effect of Interaction Between Average Electricity Deficit and Characteristics of the Policy and Politics Streams on the Predicted Probability of Policy Emulation. Panels (a) and (b) are based on the regression in Supporting Information: Table S8, column 1, while panels (c) and (d) are based on the regression in Supporting Information: Table S8, column 2. The range for each axis is the minimum and maximum value of the variable in the sample.

interactive (Figure 4). The likelihood of policy emulation was higher when the value-added of construction in the GDP and tax revenue as the share of the GDP were above about 9 percent each soon after an election. However, later in the term of the government, higher tax revenue as the share of the GDP was necessary for a comparable likelihood of policy emulation. The interaction between value-added as a share of the GDP and per capita income was more complex. The probability of emulation was very low when the value-added of construction in the GDP was high *and* per capita income was low, possibly indicating that the concerns of the construction industry over procedural delays in acquiring construction permit—if code compliance were to become mandatory—outweighed the problem severity in such a case (Pradhan, 2012). Further, the reluctance to adopt the code increased in states with high per capita income and low value-added of construction in the GDP when more years had passed since the previous election. Surprisingly though, the probability of policy emulation was higher later in the term of the government among states with low value-added of construction in the GDP and low per capita income, possibly indicating the likelihood of symbolic transfer.

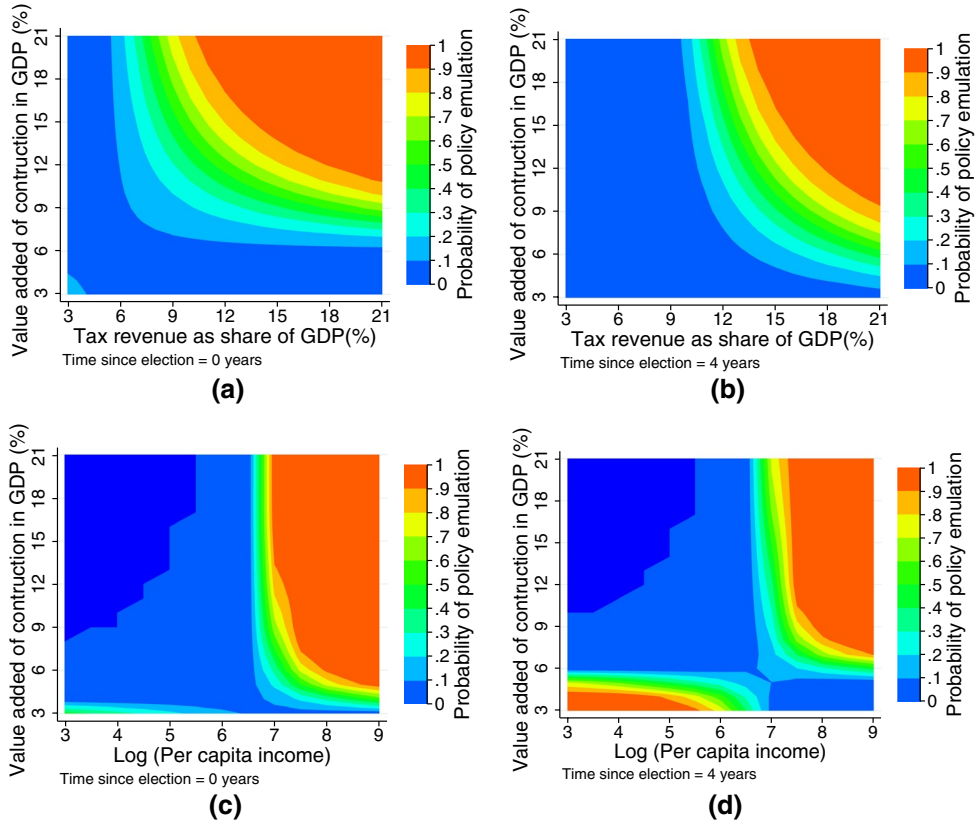

Figure 4. The Effect of Interaction Between Value-Added of Construction in Gross Domestic Product and Characteristics of the Policy and Politics Streams on the Predicted Probability of Policy Emulation. Panels (a) and (b) are based on the regression in Supporting Information: Table S8, column 3, while panels (c) and (d) are based on the regression in Supporting Information: Table S8, column 4. The range for each axis is the minimum and maximum value of the variable in the sample.

6. Discussion and Conclusion

In this study, I created a unifying theoretical framework for policy change, policy transfer, and policy diffusion and tested the hypotheses thus developed using the case of the state-level adoption of the ECBC in India. A process trace in the successful case of Andhra Pradesh showed that external influence in problem framing (*H1*) and activities of a transnational policy entrepreneur played a key role in placing the ECBC on the policy agenda during an energy crisis *(H4)*. Further, the policy community drew lessons from other states in India, and internationally, to enhance the technical feasibility of the code during policy formulation (*H2*). Meanwhile, the adoption of the ECBC in other states in the country served as a precedent and increased bureaucratic and political willingness for policy adoption (*H3*).

Complementing the process tracing, the dyadic analysis demonstrated that the structural characteristics of the three streams influenced policy diffusion (*H5*). These characteristics included: a higher level of value-added of GDP in construction and

average electricity deficit (in the problem stream); a higher level of tax revenue as a share of the GDP and per capita income (in the policy stream); and a state governed by the UPA and a state that had recently had an election (in the politics stream). Moreover, as the MSF posited, their effect was interactive and not additive; the likelihood of policy emulation increased when problem severity, policy feasibility, and electoral timing were favorable simultaneously, rather than in isolation.

This study addresses three issues in the policy diffusion literature. First, research on policy diffusion is hindered by incoherence: for instance, studies on the topic have used different indicators to measure the same mechanism and the same indicators to measure different mechanisms (Maggetti & Gilardi, 2016). This is the result of a simplistic conception of the policy process linking the reason for diffusion ("mechanisms" at the micro-level) and their observable implications ("patterns" at the macro-level). In this study, integration of the literature on policy change with that on policy transfer and policy diffusion allowed for more systematic, consistent conceptualization and operationalization of the effect of interdependence—that is, the interaction between internal and external dynamics of policymaking—at both the micro-level and the macro-level.

Second, the lack of integration of structure and agency has prevented a "full explanation" of policy diffusion. While previous studies have also proposed the conceptual integration of policy change and policy diffusion (Boushey, 2012; Braun & Gilardi, 2006), their approach has emphasized the role of structure in the process. The use of the MSF in this study helped uncover the interaction between structure, agency, and chance in policy diffusion. The dyadic analysis showed that structural characteristics of the streams influence the extent of policy diffusion. The process trace complemented this analysis by highlighting the contingent nature of windows of opportunity and the importance of policy entrepreneurship in determining when and where diffusion might result in policy change. Further, it indicated that the functional disaggregation of agency—that is, based on the stream (Goyal, Howlett, & Chindarkar, 2020; Herweg, Zahariadis, & Zohlnhöfer, 2018)—can shed further light on the dynamics of policy diffusion.

Third, research on policy diffusion has focused predominantly on the policy adoption stage and paid little attention to the effect of interdependence on agenda-setting (for an exception, see Gilardi et al., 2020) and policy implementation. Even though this study, too, focused on the policy adoption stage, the qualitative analysis showed that policy diffusion can influence agenda dynamics. In the case of Andhra Pradesh, while the problem stream witnessed the participation of a national actor, the policy stream witnessed the participation of a transnational policy entrepreneur during agenda-setting and policy formulation. Moreover, the use of the MSF—which has now been extended from agenda-setting to policy adoption and policy implementation (Fowler, 2020; Herweg et al., 2018; Howlett et al., 2015)—implies that the framework developed in this study can be applied to examine policy diffusion from agenda-setting to policy implementation in the future.

In addition, this study contributes to the theoretical development of the MSF as well. The application of the framework to a multilevel governance environment has, thus far, been less than satisfactory (Brunner, 2008). For instance, in the context of the

European Union (EU), Bache (2013) posited that the problem stream and the politics stream operated nationally even as the policy stream operated at the national and the international level simultaneously. Similarly, Cairney (2009) and Lovell (2016) argued that while the policy stream can be influenced by international transfer, the problem and politics stream were constituted domestically. This analysis shows that conceptualizing the streams in different polities as separate but "interdependent" is more accurate and generalizable as it allows for a range of empirical possibilities, from complete dependence to complete independence.

A key policy implication of this study is that the challenge of accelerating the adoption of the ECBC, specifically, and policy innovation for sustainability, generally, should be viewed as one of the policy diffusion—involving the use of interdependence to align problems, policies, and politics contextually—rather than one of the administrative coordination (Khosla, Sagar, & Mathur, 2017). This will affect, for instance, the vertical diffusion of the ECBC to the municipal level as well. As municipalities deal with a different set of priorities, tools of governance, and politics, a better understanding of their policy-making streams—and how those can be coupled—is likely to be necessary for the incorporation of the ECBC in municipal building regulation (Mathur, 2019).

This study has numerous limitations that should be borne in while interpreting its findings. First, additional variables that might influence the problem stream (e.g., urbanization, commercial floor space, price of electricity), the policy stream (e.g., capacity of the state-designated agencies), and the politics stream (e.g., interest group activities) were not be operationalized due to the lack of temporal, state-wise data during 2011-18 (Energy conservation expert, personal communication, 26 July 2018; A. Mathur, personal communication, 11 July 2018). Second, two key elements of the MSF—windows of opportunity and policy entrepreneurship—were difficult to operationalize in a large-N analysis (see Mintrom, 1997 for an exception). Third, the scope of the analysis was limited to the effect of interdependence *after* policy adoption in a sender even though policy diffusion might occur earlier. Fourth, due to its focus on a single country-single case, the generalizability of this study might be limited and the integrated framework should be applied in diverse contexts in the future. Yet, its theoretical framework and empirical application using a mixed-methods approach demonstrate a systematic path forward for research on policy change as well as policy diffusion and offer a novel perspective on upscaling policy innovations for sustainability.

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Note

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1. Independence and interdependence are understood differently in the literature on the MSF and the literature on policy diffusion. A critical assumption of the MSF is that the three streams are relatively independent of one another. Independence and interdependence, here, are used to imply the relationship among the streams within a policy jurisdiction. On the other hand, a key premise of the research on policy diffusion is that both internal and external dynamics influence policymaking within a jurisdiction systematically. In this case, independence and interdependence refer to the relationship among policy jurisdictions (and not the policymaking streams within a jurisdiction). In this article, I use interdependence to imply the latter.

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