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EDITORIAL NOTES

Complex externalities: introduction to the special issue

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Abstract
This paper introduces the special issue on complex externalities and public choice. The collection of essays extends analytical bridges between public choice, property rights economics, and new institutional economics. The essays question many of our prevailing assumptions behind the standard conceptualization of externalities. They also offer pragmatic and theoretical alternatives and apply these insights to analyze radio spectrum, environmental pollution, intellectual property, and public health issues. These essays demonstrate the ongoing significance of public choice in addressing society's most pressing challenges.

Keywords Externalities · Governance · Property rights · Institutions · Complexity

1 Introduction

Economists define externalities as costs or benefits incurred by a third party not directly engaged in an exchange process (Mulligan, 2023). Because these costs or benefits are not fully incorporated by market prices, the market is deemed to have failed. Thus, following Pigou, many economists have used the mere presence of an externality as a sufficient pretext for governmental intervention in the economy (Buchanan, 1973). Public choice scholars have responded by highlighting flaws in such conclusions, positing that if such arguments were taken to their logical end, the domain of markets would shrivel to nonexistence. Externalities are everywhere, but their presence does not give the government *carte blanche* to take control of the economy. Governments can fail to internalize the externalities under consideration and create new ones in the process (Keech & Munger, 2015; Trantidis, 2023).

Moreover, as evident from numerous policy blunders during the COVID-19 pandemic, governmental actors' abilities and benevolence are often overstated (Leeson & Rouanet,

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2021). Still, whether the conventional economic approach to externalities is sufficient or appropriate to analyze complex challenges such as climate change, pandemics, and marine ecosystem conservation remains to be settled (Nordhaus, 2019). Large-scale and nested externality challenges do not lend themselves to clear solutions (ibid.). Modeling these problems using conventional methods may generate important theoretical insights. However, their analytical simplicity comes at the cost of decreased policy relevance, owing to numerous unrealistic assumptions analysts must make (Paniagua & Rayamajhee, 2024). Due to their elusiveness, public administration scholars describe complex externalities as "wicked problems," emphasizing marginal improvement by tackling their tractable parts rather than solving the problem in its entirety (Head & Alford, 2015).

The eleven essays in this special issue share an appreciation for the insights of the conventional approach to externalities while acknowledging its limitations. They build on contributions from public choice scholars such as Gordon Tullock, James Buchanan, and Elinor Ostrom and apply them to modern contexts, where increased interconnectedness across geographic regions and cultures has made political and geographical demarcation less meaningful. Jointly, they pave a path forward to expand our understanding of externalities for the modern era using insights from public choice and new institutional economics.

The notion of complex externalities that is the subject of this special issue is akin to nested externalities, posited by Elinor Ostrom (2012) to offer a pragmatic foundation for analyzing large-scale externalities involved in climate change. For Ostrom (2012), externalities are said to be nested if "actions taken within one decision-making unit simultaneously generate costs or benefits for other units organized at difference scales" (ibid., p. 356). While nestedness is a critical source of complexity, externalities can be complex for other non-nestedness-related reasons, such as its scale, technical constraints, and interaction with adjacent externalities. For our analysis, we define complex externalities as a subset of externalities that fulfill three primary criteria. First, they involve a vast number of individuals at numerous levels. Individuals may be members of different clubs, committees, organizations, and communities and can be scattered across geographical and political units. Second, it is difficult to identify the sources of the externality. Where the source cannot be plausibly approximated, quantification challenges exist that squash any hopes of establishing systems of enforcement and accountability. Third, due to numerous sources of uncertainty, designing and implementing general systems of regulations is difficult and even counterproductive (see also Nordhaus, 2019 and Murtazashvili et al., 2023).

Many of the policy-relevant externalities today fit the above description. Pressing challenges such as climate change, depletion of global fisheries, post-disaster recovery, international migration, and banking instability all have high degrees of nestedness (Finn & Jakobson, 2021; Ostrom, 2012; Paniagua, 2020, 2021; Paniagua & Rayamajhee, 2024). Each of these externalities results from actions taken by multiple decision-makers at various levels. More importantly, addressing them requires efforts from many agents (individuals, organizations, authorities, etc.) organized at multiple, interconnected, and nested layers. This makes discerning their causes and solutions an onerous enterprise, often rife with layered and enormous transaction costs (Ostrom, 2012; Schlager & Ostrom, 1992).

In situations where externalities are complex, the reductionist approach that considers markets and governments as the only possible institutional alternatives can result in a misdiagnosis of the problem and misapplication of remedies. This can occur with both regulatory and property rights-based approaches. For instance, the Coase theorem, viewed from the Stiglerian lens, overemphasizes assigning and exchanging property rights and underemphasizes the roles of the institutional context and the specific attributes of the externality. In some cases, such as the knowledge commons, the legal assignment of property rights may be unwarranted or infeasible (Hess & Ostrom, 2007; Paniagua, 2020, 2021). Thus, the Stiglerian Coase theorem, if applied uncritically as a policy tool to solve all dilemmas, can generate unintended distortionary effects and exacerbate existing complications. Similarly, regulatory approaches can also fail for several reasons: they may be misinformed, unable to incorporate feedback promptly, and they may not predict and prevent unintended pernicious effects (Keech & Munger, 2015).

The papers in the special issue share the core idea that extending the Ostromian perspective on externalities can enhance the relevance of public choice in some of the most complicated and persistent challenges facing modern societies. They offer a fresh interdisciplinary perspective on externalities that moves analyses beyond the conventional dichotomy of private markets versus governments. In what follows, we summarize the articles in this special issue under three main thematic headings.

2 Complex externalities and nested dilemmas

The first set of essays advances the notion of complex externalities and applies them to various empirical contexts ranging from public health (pandemics), environment (pollution), and technology (radio spectrum). In all these cases, externalities are nested: that is, decisions and actions by one unit produce costs and benefits for other connected units (Ostrom, 2012). While the interconnectedness across units can be a source of substantial benefits from economies of scale and positive spillovers, they can simultaneously result in freeriding and governance problems nested across levels. Often, complexity is invoked as a rationale for centralizing the associated activity under the control of a singular authority. However, as these essays argue, such monocentric solutions designed to resolve problems at one level can be ineffective or counterproductive at solving problems at other levels. Thus, they advance a case for considering a more comprehensive range of governance solutions and tools for developing a framework that provides a relevant conceptual space to situate each institutional solution without stripping away its essential features.

Two important conclusions follow from this way of analyzing large-scale externalities. First, a high degree of nestedness increases organizing transaction costs, thus making establishing and implementing tradable property rights onerous. Even when the legal property rights-based approach is theoretically possible, they may be economically inefficient due to prohibitive transaction costs. Second, governmental wands, including regulations or artificial marketlike systems, are unlikely to be successful. They may mask the transaction costs but cannot reduce them, and they may even lead to more significant noncompliance and resentment.

This does not mean private or governmental solutions are unnecessary or superfluous. Both markets and states play critical roles in resolving *fragments* of these governance challenges. Still, it does suggest that they only constitute a segment of the solution set and are, thus, not a panacea (Ostrom, 2007; Paniagua & Rayamajhee, 2024). To internalize such externalities, we may relinquish our polar stances on bilateral voluntary exchanges or state interventions as the only feasible solutions. It requires harnessing institutional craftsmanship from the bottom up such that adequate market arrangements and governance solutions can emerge at various levels and scale up to address different fractions of the larger problem. While such an approach does not provide a ready-to-implement solutions manual, they will likely generate rules and incentives conducive to more sustainable coordination and lasting management of externalities.

Paniagua and Rayamajhee (2023) set the stage for the debate by introducing key concepts and a novel classification of externalities based on two classes of often-conflated attributes: (1) the scale of externalities, and (2) the assignability, enforceability, and tradability of property rights. Mirroring the crucial taxonomy contribution of Ostrom and Ostrom (2002) in goods and services, they develop a novel taxonomy of externalities that provides relevant conceptual space for various institutions that the market-versus-state dichotomy obscures.

Hazlett et al. (2023) apply these ideas to examine the evolution of governance practices for radio spectrum allocation in the United States. They argue that the complexity of the associated externalities, combined with the presumed inability of private entities to self-govern them, is used as a pretext to hand over all authority over spectrum governance to the Federal Communications Commission (FCC). However, parallel problems exist for the central agency and are further compounded by the lack of specialized knowledge and competitive external pressures. They provide a detailed account of spectrum governance before the advent of mobile phones and the subsequent evolution of cellular networks to demonstrate that spectrum liberalization can address many complex externalities in an increasingly complex wireless market.

Furton and Eubanks (2024) revisit a long-standing discussion surrounding the efficacy of the common law versus government intervention in addressing large-scale environmental externalities. Drawing on a conceptual framework developed by James M. Buchanan, the paper calls into question the prevailing economic dogma which holds that so-called “large number” externalities inherently necessitate government intervention. They argue that the interplay between the size of a coalition and the location of property rights determines the degree of centralization needed to ‘solve’ the pollution problem. Their vision of centralization, however, is not equivalent to government control but rather an aggregation of the collective units through a bottom-up scaling process into multiple centers–consistent with the polycentric vision of the Ostroms. Using riparian and nuisance cases from the nineteenth and twentieth centuries as case studies, they show how common law has historically managed to resolve water pollution disputes.

Trantidis (2023) considers the role of modern governments in generating negative externalities through the political bargaining process. He argues that clientelism, namely informal deals between politicians and special interests for the distribution of benefits, generates externalities for the public. These complex externalities infiltrate policymaking and distort institutions governing the operation of markets. They create government failure on the same grounds that some market externalities are considered a market failure: the costs fall on outsiders and negatively affect the terms for the production and exchange of goods and services. By showing that government action is a critical source of negative externalities, the paper challenges the standard textbook treatment of government as a necessary force to internalize externalities.

3 The anatomy of externalities and intangible commons

The second set of essays takes the discussion to philosophical and epistemological directions, inviting readers to rethink our definitions and classifications of externalities and their governance challenges. In doing so, it links insights from public choice, institutional analysis, and the philosophy of economics to disentangle the nature and institutional structure of externalities. This effort is consistent with recent public choice scholarship (Furton & Martin, 2019; Rayamajhee & Paniagua, 2021) that seeks to ground the analytical tools of economics with a more serious concern of the empirical and institutional reality in which economic phenomena such as externalities occur.

The first step towards crafting meta-rules that enable us to develop a framework for matching externalities to appropriate institutions is to take a closer look at the externality's relevant attributes, followed by an empirically grounded analysis of existing and potential institutional choice sets. Vincent Ostrom (2008 [1973]) articulated the need for fixing the 'institutional mismatch' half a century ago, yet the area remains underexplored with a few notable exceptions (Furton & Martin, 2019; Paniagua & Rayamajhee, 2023; Rayamajhee & Paniagua, 2021). Thus, the contributions in this special issue forward that conversation theoretically and by applying them to modern externalities that are increasingly diverse.

Baltzly (2024) raises a philosophical question about the nature of externalities. The paper argues that the prevailing conception of externalities and how it is applied to discuss policy issues makes two analytical mistakes. The first error is the conflation of public goods and externalities, which Baltzly calls 'coextensivism.' Baltzly points out, first and foremost, that externalities are not 'goods,' nor are they services. They are effects of goods and services external to the exchange process. Therefore, even in the most generous interpretation, equating the two is sloppiness. Baltzly calls the second error 'externality profligacy,' which arises from conflating economic externalities with social externalities. He argues that "political economists are problematically profligate" (p. 17). They tend to adopt broad definitions of externalities by which anything one does that another person does not like can qualify as an externality, needing an external authority to intervene and internalize. These errors jointly result in 'over-Coaseing' (over-applying transaction costs and property rights in all situations) or 'over-Pigouing' (over-applying governmental wands in the form of taxes, subsidies, or regulations in all situations). He argues that these errors discourage us from seeking negotiated, market-based solutions and push us towards coercive, state-based remedies to resolve social externalities.

Hudik (2024) argues that although externality is one of the basic concepts in economics, its rigorous definition remains elusive. Hudik reconceptualizes externality as an instance of a broader phenomenon of incompatibility of plans: a situation where plans of different individuals cannot be materialized simultaneously because they compete for resources that are scarce. Plan incompatibility, Hudik argues, can be addressed by institutional arrangements involving mechanisms that determine which plans will be realized. Various institutional arrangements can be compared from the perspective of efficiency, operational costs, distributional effects, and other criteria. Regardless of the institutional arrangement, the spillover effects are unavoidable, as they are implied by scarcity. The paper concludes by suggesting that the analysis of externalities should shift its focus from spillover effects to the mechanisms for allocating scarce resources among competing plans.

Goodman and Lehto (2023) examine positive and negative externalities that arise with implementing intellectual property (IP) rights to govern knowledge. IP rights internalize positive externalities associated with creating ideas and initial discovery. Without IP rights, there would be fewer discoveries and new ideas due to the presence of positive externalities that disincentivize investments. Conversely, stringent IP rights raise the transaction costs of building on existing ideas for fear of legal repercussions. This generates a negative externality through reduced innovation and experimentation based on existing ideas. This results in a situation that economists term the 'tragedy of the anticommons,' where valuable resources are underutilized (Buchanan & Yoon, 2000). They argue that the current regime leans on the side of excessive IP rights enforcement, which they attribute to the monocentric system of IP rights enforcement. They conclude that polycentric governance could generate better incentive alignment so that IP rights can be better utilized to obtain an ‘optimal balance’ between the two countervailing effects.

Dekker and Kuchař (2023) revisit the literature on private governance and argue that what the literature labels as private governance is, in fact, two distinct forms of governance: private governance and community governance. They involve different types of externalities and distinct approaches to internalizing them. The former, they contend, should be understood as the provision of market governance by external private parties, where private ‘consumers’ of governance services obtain them (through direct or indirect payments) from external (non-government) governance providers. In contrast, the latter involves a collective action whereby a group, community, or society governs its own affairs by creating and implementing rules. They argue that this form of governance is an unintended externality from social interactions in markets. By untangling the two conflated forms of governance, the article enriches our understanding of the distinct roles of markets and communities in managing externalities in the real economy.

4 Externalities, public health, and polycentric governance

The third set of essays argues that complex externalities can be addressed more effectively with polycentric institutions. This position is in line with the emergent scholarship analyzing the governance of infectious diseases and other public health crises using insights from public choice and new institutional economics (Leeson & Thompson, 2023; Paniagua, 2022; Rayamajhee & Paniagua, 2022; Rayamajhee et al., 2021). Each essay emphasizes a separate aspect of the complex nature of public health externalities, with particular attention paid to pandemics. They also conclude that centralization often fails in its promise to address public health externalities. Instead, it can suppress market mechanisms, community-based efforts, and other voluntary solutions that could partially remedy the externality problem.

Cowen and Schliesser (2023) consider novelty an essential feature of complex externalities. Considering the modern state’s confrontation with infectious diseases, the authors defend liberal democracy’s ability to cope with complex externality challenges relative to its illiberal alternatives. They contend that many externalities are novel–that is, their costs (or benefits) are unknown and must be discovered through trial and error. Further epistemic challenges can occur if the externalities evolve with time or exhibit high geographic variation. They argue that effectively responding to novel externalities requires producing and updating public information (including issuing necessary corrections) and allowing independent third parties (such as the scientific community) to check, validate, refute, or qualify them. Their analysis presents an epistemic case for polycentrism and self-governance toward crafting an inclusive and effective national policy.

Carson (2024) analyzes private and public responses to the 1878 yellow fever epidemic in the United States. Using numerous historical accounts from the southern Mississippi Valley, he compares the performances of governmental and non-governmental entities in implementing necessary quarantine measures, facilitating migration, and managing refugee camps. He further examines the municipal responses from the city of Memphis and compares them to responses by the local civil society to show the limits of governmental action. Carson attributes this discrepancy to the high transaction costs that the governmental actors faced and the lack of state capacity. Through detailed historical accounts, the paper shows that private actors were far more effective in responding to the yellow fever epidemic. Carson concludes that the standard economic thinking that governmental effort is more cost-effective in dealing with public health externalities is built on unexamined and faulty assumptions about transaction costs and state capacity.

Murtazashvili and Zhou (2023) argue that public choice scholarship provides a robust foundation for what the authors call a 'liberal political economy of pandemics.' They challenge the conventional wisdom that the complexity of pandemic externalities justifies a centralized government response and the suppression of economic freedom. They contend that polycentricity and economic freedom are essential tools in combatting public health externalities associated with pandemics, both of which are inconsistent with centralization. The authors support this position by highlighting three themes in the public choice scholarship on pandemics. First, government failures are rampant and do not support the claims that centralization is better than decentralized responses. Second, polycentric responses from diverse low to mid-level actors can significantly mitigate many pandemic externalities. Third, higher economic freedom allows private actors to innovate and implement myriad responses, thereby increasing the chances of emerging novel solutions. Jointly, these three themes provide a comprehensive foundation for the liberal political economy of pandemics where the goals of externality mitigation go hand in hand with individual liberty and wealth creation.

5 Conclusion

Building on insights from Nobel laurates Ronald Coase, James Buchanan, and Elinor Ostrom, the contributions in this special issue untangle the scalar and institutional dimensions of an externality and closely examine the implications of the interaction between factors. The essays extend the analytical bridges between the public choice tradition, property rights economics, and new institutional economics. Jointly, they highlight the enduring appeal of the intellectual trio's contributions in analyzing the most pressing challenges of our times. By expanding the scope of public choice analysis to new domains beyond the market-state dichotomy, they strengthen the power of public choice insights and open new avenues of future research. We are confident that these insights will be an enduring and long-lasting contribution to the public choice tradition, opening new and unexpected avenues of research.

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