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In markets we trust? Setting the boundaries of Market-Based Instruments in ecosystem services governance

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ABSTRACT

A growing tendency to frame environmental problems as a failure to price ecosystem services has coincided with the rise of so-called “Market-Based Instruments” (MBIs). The aim of this introductory article to the special section “In markets we trust? Contrasting views on the performance and legitimacy of Market-Based Instruments in ecosystem services governance” is to promote critical reflection about the nature, scope and limits of MBIs in ecosystem services governance and to provide guidance on where the boundaries for the application of markets ought to be set. First, we examine the role that methodological assumptions and implicit normative positions play in shaping academic perception of the effectiveness and legitimacy of MBIs. Second, we examine MBIs in the broader ideological context and socio-political processes that have favored their development and implementation. Third, we test claims of the literature on MBIs against insights and data from case studies presented in the special section. Fourth, we discuss the scope and limits of markets in ecosystem services governance in the light of biophysical, institutional, and normative boundaries. We end with a summary of concluding remarks from the special section and by identifying critical tasks for the scientific and policy agenda on ecosystem services governance.

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1. Introduction

What should be the role and reach of different policy instruments, and in particular the so-called “Market-Based Instruments” (MBIs), in environmental governance? As markets and market values expand into environmental domains that have been traditionally governed by nonmarket norms (Harvey, 2005), some authors point to this question as a critically important missing debate (Gustafsson, 1998; Sandel, 2012; Satz, 2010).

Since the late 1980s, the same institutions (environmental agencies, national governments, and intergovernmental organizations) that steered the first generation of environmental policy regulations, mostly based on standards enforced by the state through “command-and-control” mechanisms, have embraced a “new generation” of environmental policy instruments, usually labeled under the umbrella of “MBIs”. In comparison to so-called “command-and-control” approaches, proponents argue that MBIs are more flexible, cost-effective, and better at rising resources from the private sector (Stavins and Whitehead,

1997). Policy instruments labeled as MBIs include carbon trading schemes, wetland banking, biodiversity offsets and Payments for Ecosystem Services (PES) (Pirard, 2012). One of the distinctive features of this literature is the lack of a consensual definition and therefore a clear delimitation of MBIs.

Indeed, although we use here the term MBIs for the sake of continuity with previous literature, we have argued elsewhere (Muradian and Gómez-Baggethun, 2013) that “MBIs” is a flawed and problematic category due to the confusion that the term “market-based” has induced. It is worthwhile to clarify here that not all the instruments that have been coined as MBIs would fall within a strict (even imperfect) definition of markets, neither all of them share the expectation to influence prices or the cost/benefit calculations of economic agents (an argument that has been used to include subsidies or taxes among MBIs). For the purpose of this paper, we assume that a core characteristic of the instruments labeled as MBIs is the expectation that they can entail economic efficiency gains when attaining environmental goals as compared to so-called “command-and-control” instruments due to their expected higher degree of flexibility.

Although they are inter-related processes, we should not automatically equate the emergence and application of MBIs with markets and market values. In fact, the ascent of market-based approaches in environmental policy and conservation has paradoxically coincided with a

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relative downturn in the international agenda for market liberalization.¹ Hence, if the financial crises started in 2007 put a provisory end to the era of so-called “market triumphalism” (Sandel, 2012), it did not apparently shake the interest on MBIs, since they have kept gaining traction among economists, policy makers, and natural scientists over recent years (Pagiola and Platays, 2007; Engel et al., 2008; Miles and Kapos, 2008; Lockie, 2012; Lapeyre et al., in press).

The rise of MBIs has been nonetheless accompanied by heated debates. Skeptics and critics suggest that MBIs can erode intrinsic motivations for conservation (Bowles, 2008), contribute to undesirable commodification of nature (McAfee, 2012), and promote unequal access to land and resources by privileging those with ability to pay (Martínez-Alier, 2002; Corbera et al., 2007). After years of discussion, it is time to take stock and draw on advances in the recent literature on MBIs and on the evidence from case studies worldwide to appraise the extent to which expectations and fears related to the sue MBIs for ecosystem services governance match observations on the ground.

Such an appraisal is not an easy matter since the outcomes of the assessments depend to a large extent on the “analytical lens” adopted. Within the academic community, views on the virtues and vices of market mechanisms for environmental governance vary greatly across disciplines and the ideological spectrum. Conclusions about the adequacy of a given scheme differ greatly depending on the relative weight given to different appraisal criteria, such as economic efficiency, environmental performance, and distributive justice. Hence, economists, ecologists and political scientists often reach diverging conclusions about the virtues and drawbacks of MBIs. These conclusions may all be internally consistent with the analytical lenses of each school of thought. However, self-referential debates within disciplines or schools hamper the much-needed exchange across epistemic communities in order to promote societal debate on clarifying the boundaries of MBIs in environmental governance.

The special section that we introduce in this paper, “In markets we trust? Contrasting views on the performance and legitimacy of market-based instruments in global environmental governance”, breaks through disciplinary walls and brings together views from economics, political ecology, institutional theory, moral philosophy, and environmental sciences to the same discussion table. In doing so, it shows the many dimensions of MBIs and the issues at stake, involving both advocates and critiques of these instruments. As discussions around the green economy and the new Sustainable Development Goals shape the form that environmental and economic policies will adopt in the coming years, we believe that holding this debate is currently of paramount importance.

The aim of this introductory article to the special section is to promote reflection among academic communities, policy makers and society at large about the nature, scope and limits of different policy instruments, and in particular MBIs, in ecosystem services governance. First, we examine the role of analytical lenses, methodological assumptions, and implicit normative positions in shaping the perception of the effectiveness and legitimacy of MBIs. Second, we examine MBIs in the context of the broader ideological frames and sociopolitical processes that have favored their development and implementation in environmental policy. Third, we test theoretical claims of the literature on MBIs against insights and data from case studies presented in the special section. Fourth, we discuss the scope and limits of MBIs in ecosystem services governance in the light of both technical and normative boundaries to their application. We end up with a summary of concluding remarks and by identifying critical tasks for the scientific and policy agenda on ecosystem services governance.

2. The Analytical Lens of Market Environmentalism

The rising influence MBIs is related to a particular way of conceptualizing environmental problems, which also logically condition the associated sets of policy propositions to deal with them. Here, we trace the assumptions and implicit normative positions underlying the case for MBIs.

Philosophers of science have since long discussed the role that systems of values, assumptions and propositions play in defining the way problems are framed and solutions proposed. Building on key contributions in this field (Polanyi, 1946; Schumpeter, 1949; Kuhn, 1962) and discussions about the role of ideological premises and mental models in shaping the environmental science and policy agendas (e.g. Bromley, 1990; Gómez-Baggethun et al., 2010; Spash, 2012) here we attempt to identify the key assumptions (analytical lens) underlying the way problems and solutions are framed by the perspective of so-called market environmentalism, an epistemic community that was decisive in the conceptualization and dissemination of MBIs.

Market environmentalism is referred here as the community of scholars and policy makers that share an approach to environmental governance characterized by the goal to conciliate economic growth, allocation efficiency and environmental conservation (Anderson and Leal, 2001). Core elements in market environmentalism include the establishment of well-defined property rights for ecosystem services, economic valuation of environmental externalities, and the promotion of MBIs for environmental protection (Gómez-Baggethun and Ruiz-Pérez, 2011).

Market environmentalism is embedded in a vision that conceives money and markets as the overarching system of reference defining what is internal and what is external to the mechanism of societal choices. Environmental problems are framed in terms of “externalities”, understood as effects that some agents cause on the wellbeing of others that are not mediated by market transactions. Externalities, which can be negative (e.g. pollution) or positive (e.g. ecosystem services) are seen to derive primarily from “market failures”, amenable to repair through the internalization of social costs into private costs that ultimately should be reflected in prices. Internalization of costs can be done either through state intervention (Sandmo, 2011) or private transactions (Engel et al., 2008). Negative externalities such as pollution can be internalized by obliging economic actors to carry the costs of the external effects produced by their private activity (polluter pays principle) whereas positive externalities can be internalized by paying those who produce them (provider gets principle).

Measurement of externalities through valuation in simulated markets is assumed to facilitate this task, by means of estimating the potential efficiency gains and the distribution of costs and benefits between different social agents. Since the solution of environmental problems is conceived essentially as an issue of influencing production costs and prices, this framework assumes that the solution to environmental problems lies on the technical domain of estimating and enforcing the “right price”. “Optimal” solutions are therefore theoretically possible and “Getting prices right” (ten Brink et al., 2012) or “correcting the economic compass” (UNEP, 2011) is seen as a key means for solving environmental problems. From this perspective, the main contribution of the concept of ecosystem services is that they render visible environmental externalities. The conservation of ecosystems would be ensured as far as the services they provide are acknowledged, measured and incorporated into both private and public decision making or, in the jargon of The Economics of Ecosystems and Biodiversity, as far as ecosystem services are *recognized, demonstrated, and captured* (TEEB, 2010).

Market environmentalism adopts efficiency as the core guiding principle for policy design. What matters is the overall ratio between social costs and benefits. Since from its point of view solving environmental externalities by definition leads to efficiency gains, incorporating environmental concerns into economic decision-making can enhance

¹ The Doha Round for the global liberalization of trade is dead and since 2010 most countries have given up liberalization of trade and given priority to bilateral or multilateral treaties (The Economist, 8/9/2012).

economic growth, instead of jeopardizing it. This current is thus optimistic about win-win policy outcomes and the possibility of achieving green growth as long as the right incentives are designed to align market forces with environmental goals. From this point of view, MBIs are expected to be instrumental in achieving win-win policy outcomes, since they are conceived as internalization mechanisms that resolve market failures by getting the “right price” of market products.

The broader analytical lens of market environmentalism share elements with the rationality or total view that Polanyi (1947) referred to as ‘market mentality’ and its concrete methodological promises are rooted in neoclassical environmental economics. The following section deals with how the set of beliefs and assumptions described above came to gain a higher leverage in policy and academic circles.

3. Rise of Market Based Instruments in the Environmental Policy Agenda

3.1. Ideological and Political Driving Forces

The expansion of MBIs is often “naturalized” either as a logical outcome of their alleged superiority to direct public regulation (Stewart, 1992) or as if they were driven by forces that are exogenous to political processes (Sandel, 2012).² The sense of spontaneity implied in these perspectives, however, downplays the role of the authors and organizations that have crafted and successfully mainstreamed the case for MBIs. Below we trace the agency behind the promotion of the agenda of MBIs through a review of key literature, research programs and policy reports developed mostly over the 1990s, pioneered by economists and lawyers of top U.S. universities.

In the late 1980s, by the time that Ronald Reagan and Margaret Thatcher proclaimed their conviction that markets rather than governments held the key to human prosperity and freedom, many economists concerned with environmental problems started to emphasize the alleged advantages of MBIs over environmental policy instruments based on direct state-driven regulation (Ackerman and Stewart, 1985; Stewart, 1992). The core behind the case for MBIs is that trade mechanisms are more efficient and cost-effective than regulatory standards (Goulder et al., 1999). Letting the market rather than regulators guide individual actors’ choices, profit motivated agents who can control impacts at low cost will reduce emissions to comply with limits (Baumol and Oates, 1988). They can then sell surplus allowances at a profit to higher cost agents. If the cap is set appropriately – proponents argue – marketable permits achieve the same level of protection as direct regulation alternatives but at lower cost (Foster and Hahn, 1995).

In 1987 the Brundtland report on sustainable development made a case for “expansionary policies of growth, trade, and investment” (WCED, article 24) and the Rio Declaration of 1992 argued in favor of an “open international economic system that would lead to economic growth and sustainable development in all countries”, warning that policy measures for environmental purposes should not distort international trade (UNCED, 1992, Principles 12 and 16). Since the Rio 1992 Conference, the United Nations worked with the General Agreement on Tariffs and Trade (GATT, today World Trade Organization) to harmonize sustainable development with free trade (Michel, 1996).

In 1996, the U.S. President’s Council on Sustainable Development produced a consensus report recommending that “Sustainable Development objectives must harness market forces through policy tools such as emissions trading deposit/refund systems and tax and subsidy reform” (President’s Council on Sustainable Development, 1996). In 1997, the “Next generation project”, sponsored by Yale, made new calls for the use of market mechanisms in environmental policy (Chertow and Esty, 1997; Stavins and Whitehead, 1997). By the late

1990s, a near-consensus had been reached in policymaking circles of the U.S. for a sharp turn away from past patterns of regulation toward the theoretically greater efficiency of tradable emission permits and other market incentives. In Europe taxes still remained the preferred economic instruments for some years until the carbon trading system was instituted (Spash, 2010).

The Johannesburg Declaration on Sustainable Development in 2002 pleaded to “work together to [...] benefit from the opening of markets” (Principle 18) noting in the Annex titled “Plan of Implementation” that incentives for green investments should be provided “avoiding trade distorting measures inconsistent with the rules of the WTO” (paragraph 16b). Paragraph 20 further refers to the promotion of “sustainable development through the use of improved market signals”. The final declaration of the 2012 Earth Summit “Rio+20” states “We reaffirm that international trade is an engine for development and sustained economic growth, and also reaffirm the role that [...] meaningful trade liberalization, can play in stimulating economic growth and development worldwide” (UNCSD, 2012; revised in Naredo and Gómez-Baggethun, 2012).

3.2. Market Environmentalism and the Ecosystem Services Approach

The ecosystem services approach was originally introduced as a metaphor to illustrate societal dependence on ecosystems. Its theoretical core was shaped by ecological thinking and largely decoupled from market-oriented approaches (Gómez-Baggethun, 2010). Yet, market environmentalism has benefited a great deal from the emergence and popularity of the ecosystem services approach. Over the 1990s, the ecological literature on ecosystem functions increasingly hybridized with the economic literature on valuation of the environment (Costanza et al., 1997; Balmford et al., 2002). In the name of pragmatism and emergency, a growing emphasis was made on market-based valuation and incentives to “make conservation profitable” (Daily and Ellison, 2002), leading to a rise of literature on environmental and ecosystem services valuation that culminates in the publication of influential reports like The Stern Review of the Economics of Climate Change (Stern, 2006) or The Economics of Ecosystems and Biodiversity (TEEB, 2010).

The popularity of the market approach may in turn be explained by a combination of other factors. First, the failures of traditional environmental policy (such as protected areas) and integrative approaches (such as integrated development and conservation projects) to reduce the high rate of decline of natural ecosystems. Second, the fact that the metaphors advanced by the ecosystem services framework are largely compatible with the adoption of MBI, due to its utilitarian vision of nature’s functions and their division into discrete categories, whose contributions to economic processes can be eventually evaluated and monetized. Techniques for economic valuation of the environment have been in place for decades, but have loomed with the emergence and consolidation of the ecosystem services framework. This framework actually arose from the expectation that by showing the “usually free-of-charge” contribution of ecosystem services to the economy would rise societal support for the conservation of ecosystems.

The type of market-oriented reasoning that has permeated into much of the broader ecosystem services literature rarely adopts the explicit tone and content we can find in the neoliberal economic and policy texts of the 1990s. As the literature on market-based valuation and instruments hybridized with the one on ecosystem services, market reasoning appears in more diluted, implicit, eclectic and nuanced forms, where MBIs are generally presented as part of a broader policy toolbox (TEEB, 2010; UNEP, 2011). For example, the literature on “policy-mixes” emphasizes the complementary nature of command and voluntary approaches and argues that the suitability of different economic instruments depends strongly on context and ecosystem type (Barton et al., 2013).

² As a notorious proponent of limits to markets puts it: ‘We did not arrive to this condition through any deliberate choice. It is almost as if came upon us’ (Sandel, 2012: 5).

4. Reality and Myth in MBI: Lessons From the Special Section

Much of the debate about the virtues and vices of MBIs for ecosystem services governance has relied heavily on ideological claims, untested assumptions, and implicit normative positions. As recent debates in the literature have brought about conceptual clarity and as a mounting body of data is emerging from case studies worldwide, time is ripe to contrast some of the assumptions that have been providing molds for debates on MBIs against the realities observed on the ground. Here we focus on four aspects where the contributions of the special section shed new light: i) the institutional nature of policy instruments labeled as MBIs, ii) the conception of PES as markets or market-like mechanisms, iii) the degree of freedom and voluntariness in market transactions, and iv) the motivational effects of economic incentives for conservation.

4.1. The Institutional Nature of “Market-Based Instruments”

The case for the superiority of MBIs has been crafted through an emphasis on an alleged blunt divide between state-driven and market-driven instruments. Here the former are portrayed by market environmentalists as rigid, top-down, “command and control” approaches that are contrasted with MBIs, assumed to be more flexible and adaptive (Stewart, 1992), more respectful of freedom (Ackerman and Stewart, 1985), more cost-effective (Baumol and Oates, 1988), more likely to create win-win solutions (van Wilgen et al., 1998; Pagiola et al., 2002), and more likely to foster technological innovation (Ackerman and Stewart, 1985; Lockie, 2012).

A first necessary step for situating this debate is that the blunt divide between market and states in economic instruments is a false dichotomy. Polanyi's (1944) insight that markets cannot operate without active intervention from states and that “free market” economic policy responds itself to a particular form of regulation holds entirely for this discussion (see also Bromley, 1997). It should be noted that awareness that markets vs. states represent a false dichotomy is not new in the environmental policy debate (Aguilera Klink, 1992; Driesen, 1998) and has been recalled in recent contributions (Pirard, 2012; Muradian and Rival, 2012; Muradian and Gómez-Baggethun, 2013), yet this framing remains a major confusion in debates around MBIs.

Contributions in this special section shed further light in this corner. As noted by Vatn (2015), what protects the environment in any economic instrument including a market mechanism is not the trade element but the element of command that defines the liability or politically-set environmental target. In environmental trading schemes such as carbon markets, tradable fishing quotas, or tradable water extraction rights, it is the cap, i.e. the politically set limit on emissions, fish harvesting, water extraction, or land use change that protects the ecosystem and associated services. What the market component can do, provided certain conditions are met, is to increase the cost-effectiveness to reach those targets,³ relative to alternative pathways, such as prescriptive technological standards. Even so, the situations in which the market element can increase cost-effectiveness depends entirely on the specific conditions at stake, such as the feasibility of accurate measurement (Salzman and Ruhl, 2000; Kroeger and Casey, 2007) and possibility to keep transaction costs low (Vatn, 2010; Muradian et al., 2013).

Even those schemes where the trading component is most prominent (such as biodiversity offsets or wetland banking) are characterized as a variety of institutional arrangements and depend on an active regulatory role from public bodies (Lapeyre et al., in press; Vaissière and

Levrel, 2015). Furthermore, in many environmental policy tools involving monetary transactions, such as PES, the market component is limited when it exists at all, and the state often plays a crucial role in setting the levels and conditions for the monetary transfers. In the following sub-section, we elaborate further on this.

4.2. Market Mythology in Payments for Ecosystem Services

A large body of literature over the last decade has portrayed PES either as markets or MBIs (Pagiola et al., 2002; Kroeger and Casey, 2007; Milder et al., 2010). This conception has been promoted by i) market jargon used in pioneer contributions defining and describing PES as mechanisms where ecosystem services are bought and sold between beneficiaries and providers of those services (Wunder, 2005; Engel et al., 2008); and ii) an emphasis on a few private schemes for water shed governance that are far from representative of the broader PES reality (e.g. Vittel in France). A wealth of literature followed, where market environmentalists took for granted the alleged virtues of PES to present them as cost-efficient mechanisms to provide public goods, whereas some opponents from different streams of thought often took this market-like framing for granted and responded by portraying PES as instruments of “neoliberal conservation” (Büscher, 2012; Wynne-Jones, 2012), contributing to expand market mythology around PES.

With the perspective gained after years of analysis on how PES operate on the ground, nowadays we know that most schemes that are labeled under this also vague rubric are far from meeting the conditions of a market transaction (Pirard, 2012; Muradian and Gómez-Baggethun, 2013). In most payments schemes, ecosystem services are rarely well defined (Farley and Costanza, 2010), fully voluntary (Vatn et al., 2011), or conditional to verified additional provision of ecosystem services (Naem et al., 2015).

Whether we measure it in physical (land area) or economic terms (volume of payments), the vast majority of PES activity as of today is run by states under public policy regulation frameworks. This holds true for the largest PES schemes operating at present, such as the ones in Costa Rica, Mexico, Ecuador, China or Vietnam, and the agro-environmental payments of U.S. and Europe. In all these cases, funds to run PES schemes are collected through taxes and fees imposed by public authorities and the level of payments is politically set, mainly based on opportunity costs and negotiations with the concerned stakeholders. Besides illustrating the limited market element in these mechanisms, when it exists at all, this calls into question another untested assumption in the literature, namely the alleged superior ability of MBIs to raise money among private actors. Research by Milder et al. (2010) about global trends in markets and payments for ecosystem services found that the vast majority of funding to operate these schemes comes from public bodies (see also Vatn et al., 2011). Vatn (in this issue) notes that the participation of public funding in PES schemes amounts to 90% and this figure rises to 99% in PES schemes oriented at public goods.

These insights and data suggest a PES reality that has little to do with the market mechanism where private profit motivated actors protect nature at lower costs as portrayed in idealized Coasean approaches (e.g. Engel et al., 2008; Kinzig et al., 2011). Despite the market nature of these mechanisms, emphasized by both market environmentalists and their most determined critics, the reality we observe in most PES schemes are variants of green rural subsidies whereby states pay landholders and communities to either reward their stewardship or compensate opportunity costs from restrictions in land use changes.

Our special section further contributes to clarify confusions around the concept of PES. Importantly, Wunder (in this issue) revisits his influential original proposition (Wunder, 2005) in the light of new available knowledge to propose a refined PES definition a notable innovation of which is its disassociation from a market-like scheme.

³ This point is generally clear to most economists advocating MBIs but not so for the many natural who have adopted the economic discourse in the name of an alleged pragmatism (see e.g. Spash, 2011).

4.3. On Market-Based Instruments, Voluntariness and Freedom

Another claim of market environmentalists on MBIs concerns their alleged higher compatibility with freedom, a proposition grounded on the belief that voluntariness constitutes one of the core defining components of markets and trade (Ackerman and Stewart, 1985). Again, beliefs in this respect should be tested against other propositions. First, as we have already stated above, most policy tools labeled as MBIs include environmental liabilities that are set by command and in many cases these policy instruments are run on funds imposed by public authorities through taxes and fees. A second issue that deserves attention is that policy instruments are designed and implemented in the presence of asymmetric class and power relations. This explains why low-income people often accept lower compensations for ecosystem services loss or for exposure to hazards. As Martínez-Alier (2002) puts it, “the poor sell cheap”.

Contributions to this special section advance a more nuanced perspective in this regard by pointing to a marked conflict between freedom and inequality in market exchanges. Specifically, it is noted that if there are severe inequalities (Neuteleers and Engelen, in this issue) or if people are in dire need of basic necessities (Farley et al., in this issue), coercive bargaining conditions reduce the voluntariness in market exchanges. Vatn (in this issue) notes that poor people may be forced to sign contracts that people with more resources could avoid to conclude that “while trades are between formally equal parties, the level of freedom may vary substantially” (ibid: 99). Drawing on case studies on MBIs and PES in Colombia, Marin-Burgos et al. (in this issue) and Rodriguez and Budds (in this issue) stress the role of power relations in defining where MBIs are implemented or resisted as mechanisms for environmental governance.

4.4. Frame Shifting and Motivational Effects of Market-Based Instruments

According to the assumptions of neoclassical microeconomics, an increase in the economic incentives provided for an activity will enhance performance (e.g. ecosystem services supply) (Engel et al., 2008). The literature on behavioral and experimental economics has shown however that economic incentives can interact with intrinsic motivations for environmental protection in complex and non-linear ways, sometimes eroding them (Bowles, 2008). This concern has been raised in previous literature on extended market valuation and PES (Vatn, 2010; Gómez-Baggethun et al., 2010; Muradian et al., 2013), but drawing mostly on insights from other fields.

The contributions to this special section bring new theoretical insights and empirical findings in this regard. Fisher and Brown (in this issue) and Neuteleers and Engelen (in this issue) illustrate situations when merely using economic discourse can crowd out people's positive attitudes toward ecosystem services protection. They examine the motivational effects of utilitarian framing and market-based valuation to conclude that there are reasons to be careful in applying market values given the potentially negative effects in long-term ecosystem services protection. Their insights challenge the proposition that monetization and commodification of ecosystem services are to be seen as disassociated phenomena (e.g. Costanza, 2006). While conceding that monetization and commodification are not necessarily concomitant processes, they note that utilitarian framings and economic valuation are forms of ‘commodification in discourse’, that can pave the way for real commodification through frame shifting and monetization (Robertson, 2006; Wynne-Jones, 2012), often leading to the “tragedy of well-intentioned valuation” (Gómez-Baggethun and Ruiz-Pérez, 2011: 624).

Rode et al. (in this issue) bring this analysis further in a systematic review of empirical evidence on motivation crowding effects with economic instruments for biodiversity and ecosystem services protection. Their findings indicate that motivation-crowding effects with economic instruments can occur both in environmentally “negative” and

“positive” directions, but that existing empirical evidence of motivation crowding-out outweighs evidence of crowding-in effects. While the authors call for caution in the interpretation of this result due to data limitations and limited comparability across studies, their research adds to the mounting body of literature that warns of the risk that markets and MBIs can bring about changes in values and motivations that may have counterproductive effects in long term environmental protection (e.g. Cardenas et al., 2000; Fehr and Falk, 2002; García-Amado et al., 2013).

This calls for paying attention to the discussion about the extent to which MBIs can improve the governance of the ecological commons, from the global to the local levels (Farley and Costanza, 2010; Farley et al., in this issue), an issue that is discussed further in the following section.

5. Setting Boundaries of Policy Instruments in Ecosystem Services Governance

Ever since Aristotle made his observations on the contrast between *oikonomike* and *chrematistike*, through Kant's contrast between the realms of dignity and prices, to contemporary discussions in moral philosophy, the reach and legitimacy of the market have been the subject of continued societal debate (Sandel, 2012; Satz, 2010).

When it comes to MBIs, a key issue at stake is to define criteria that may provide guidance to the societal debate on where to draw the limits of these instruments, in relation to other policy alternatives. Such criteria should include both normative and practical considerations, such as environmental justice, incommensurability, transaction costs, and technical feasibility (Gustafsson, 1998; Kallis et al., 2013). Here, we contribute to this task by illustrating four types of boundaries to inform societal, scientific and policy debate on the scope and limits of MBIs in ecosystem services governance: biophysical, institutional, ethical and political. While, these boundaries partly overlap with each other, each of them emphasizes particular issues.

As stated above and discussed at length in the contribution of Vatn to this special section, not all MBIs fall within the categories of markets, even though the literature of market environmentalism have conceptualized them as such. Markets for governing ecosystem services only correspond to a sub-set of MBIs. Boundaries between the character of different governance approaches and tools are often blurred, due to the complexities involved in defining the boundaries described below.

5.1. Biophysical Boundaries

Biophysical limits to commodification relate to the difficulties that arise in the attempts to break down ecological complexity into compartmentalized tradable units (Vatn and Bromley, 1994; Salzman and Ruhl, 2000) or, as Georgescu-Roegen (1971) would have put it, to the limits we encounter in our attempts to frame in *artimomorphic* (discrete) terms biophysical entities that are *dialectic* (overlapping) in nature. Unlike many fungible economic goods, ecosystem services are intertwined with one another and emerge from complex relations between interacting ecosystem processes and components.

Attempts to extrapolate atomistic and mechanistic conceptions to ecological domains in order to establish well-defined ecosystem service units ultimately encountered structural limits related with the overlapping, interactive and diffuse borders of ecosystem processes and components (Gómez-Baggethun, 2010). For the discussion at stake, the main practical implication translates into the obstacles for measuring, valuing and monitoring ecosystem services at costs that are low enough to incorporate them into decision making (Salzman and Ruhl, 2000; Kroeger and Casey, 2007). Vatn (in this issue) argues along a similar line to explain why most PES are public, typically flat rate and directed at coarse proxies. Practical examples of biophysical obstacles to commodification of entangled ecosystem functions and components are illustrated by Bakker (2005) in relation to the privatization of water

supply in the United Kingdom and Robertson (2006) in relation to wetland banking schemes in the United States.

5.2. Institutional Boundaries

A related type of technical boundaries relates to the institutional character of ecosystem services in terms of rivalry and excludability. Market exchange presupposes excludability in supply and rivalry in demand. If there is no excludability in supply and there is no rivalry in demand, the goods and services are public, which is the case of most supporting, regulating and cultural ecosystem services (Farley and Costanza, 2010; Muradian and Gómez-Baggethun, 2013). The implications here are again of practical nature: as we move along the continuum from ecosystem services with private to public good character, the transaction costs to enforce exclusion mechanisms increase to levels that in general do no longer make markets a viable or practical option. The practical implication is that most cases of policy approaches aiming to govern ecosystem services correspond to “hybrid” arrangements, combining market and hierarchical elements (Muradian and Rival, 2012).

5.3. Ethical Boundaries

Ethical boundaries derive from the normative presumption that some things should not be for sale (Sandel, 2012; Satz, 2010). Environmentalists have long raised concerns on the extension of market values into aspects of the environment that have been traditionally protected on the basis of their intrinsic value (McCauley, 2006), often stressing problems about incommensurability of values (Martínez-Alier, 2002) and refusals to make trade-offs (Spash, 2000).

Discussions about ethical limits to money and market values have gained new momentum in relation with ecosystem services (Luck et al., 2012; Jax et al., 2013). Specifically, the extension of money and markets into spheres of the environment that have traditionally been governed by nonmarket values and norms raises important issues related to demeaning and frame-shifting effects. For example, it is noted that when the importance of something is perceived to reside primarily in its symbolic, cultural, or spiritual value – as in most “cultural services” (Chan et al., 2012) – or in its ecological or intrinsic value – as in “habitat services” – (McCauley, 2006), market valuation can downgrade and demean such values by conveying the notion that they can be replaced by market substitutes with equivalent exchange value (Jax et al., 2013). In addition, market-valuation privileges the visible and known (e.g. charismatic species) over what is invisible and unknown (e.g. ecological processes) (Peterson et al., 2010).

Ethical boundaries are not necessarily equally relevant for all ecosystem services, and their prominence relates to the symbolic values that are attached to particular ecosystem components, as well as to the motivations underlying their protection. For example, the emotional bonds we may develop in relation to wildlife or the cultural values we associate with a lake may not be comparable to those we develop in relation to carbon stocks. Hence, from the perspective of symbolic values and irreplaceability, MBIs like wetland banking or biodiversity offsets may be more problematic than for example carbon markets (Balderas Torres et al., in this issue). The degree to which an ecosystem service is essential to cover basic human needs may also be seen as an important criterion to define limits to commodification (Farley et al., in this issue).

5.4. Right-based Boundaries

Political boundaries stem from active opposition to the expansion of specific policy instruments involving re-definition of property rights into new lands or environmental domains, for their implications for rights of access to land and resources. Historically, this type of contestation has revolved primarily around opposition to privatization and enclosure of communal lands (Marx, 1842/1975; Polanyi, 1944; Federici,

2004; Harvey, 2005), and associated resources and ecosystem services (Gómez-Baggethun et al., 2013).

Some rural and indigenous communities and environmental justice groups oppose PES and forestry carbon projects on the grounds that they represent a form of commodification of their life-support systems (Martínez-Alier, 2002), promote unequal access to ecosystem services by privileging those with ability to pay (Zografos et al., 2014), consider them to conflict with customary rights of access to land and resources (Ibarra et al., 2011), or perceive them as benefiting primarily land-owners and rural elites (Corbera et al., 2007). Equity considerations and right-based perspectives are critically important in shaping the boundaries of policy instruments in environmental governance (Pascual et al., 2014).

6. Conclusion

Market environmentalism has become highly influential in the environmental science and policy agendas over recent years. Such influence includes the prevailing ways of conceptualizing MBIs, and in part explains the rapid dissemination of these instruments in academic and policy arenas. In this paper we have synthesized some of the arguments contesting the underlying analytical lens of market environmentalism, as well as we have discussed the boundaries of policy instruments (and in particular MBIs) in ecosystem services governance. Main insights from our syntheses of the this special section include i) the decisive role of analytical lenses in the way biodiversity loss and ecosystem service decline is framed and solutions proposed, ii) the implications of disputes around the concept of MBIs and iii) the scope and limits of these instruments in ecosystem services governance.

First, the framing of ecosystem services as externalities is embedded in a particular vision that conceives markets as the overarching institutional framework defining what is inside and outside the system of societal choice and that conveys the notion that the solution to environmental problems is to be found in the technical domain. By exposing the analytical lens of market environmentalism to alternative perspectives, contributions to this special section reveal the institutional, ethical, political, and biophysical dimensions of the problem at stake.

Second, as traditionally used, the very notion of MBIs for ecosystem services has acted as a major source of confusion by collapsing into a single category economic instruments that range from actual markets (carbon trades), to mixes between regulatory and trade-based instruments (biodiversity offsets) to instruments where the trade component is not present at all (most PES schemes). The lack of acknowledgement of this complexity of policy instruments has often misplaced the debate about the virtues and vices of “markets”, among both market environmentalists and their critics.

Third, our special section illustrates a tension that emerges in recent discussions about the relation between so-called MBIs and the commodification of nature. On the one hand, it shows that most PES and some other economic instruments traditionally labeled as MBIs do not qualify as markets, and thus cannot be seen to represent any complete or even advanced form of commodification. On the other hand, it illustrates that the extension of market-oriented values, logic, and language into novel environmental domains may drive the symbolic and discursive changes that characterize early stages of commodification processes. That is, market reasoning has frame-shifting effects that can erode the conceptions, norms, and taboos that act as cultural barriers to the extension of markets and market values to domains traditionally governed by non-market norms.

A critical question to address is what the scope for MBIs (including the combination of different governance forms and policy tools) in the governance of ecosystem services should be. While technical issues such as the fungibility, substitutability, rivalry and excludability of ecosystem services are important guiding criteria, we assert that the question of the scope and limits of MBIs is essentially a political dilemma regarding the type of institutional arrangements societies want to

adopt to secure the sustainable governance of the environmental commons. In such discussions, we should avoid both Manichean discourses and over-simplifications about what the different options are and what they can actually deliver in environmental governance.

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