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Going Global: Travelling with the 'Market for Pollution' from Theory to International Level Policy

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Abstract

The 'market for pollution' instrument was first proposed in the 1960s. It travelled to various theoretical and policy contexts in the 1970s and 1980s. In 1997, it became one of the first international-level economic instruments as part of the Kyoto Protocol. This dissertation approaches the 'market for pollution' as a case study in order to shed new light on both the history of environmental and ecological economics and 'ideas-performativity' studies. The ideas-performativity literature is a sub-section of the history of economic thought that investigates how ideas travel, become policy, and have performative effects. This dissertation adopts, revises, and extends concepts from this literature, such as 'travelling ideas', knowledge users, producers and brokers and a policymaking framework, in order to explain how and why the 'market for pollution' travelled in the pre-Kyoto period. The idea travelled because it had 'character': it was flexible, manipulable, and congruous with prevailing policy paradigms. In the decades before the Kyoto Protocol, it accumulated good 'companions' that assisted its travels and demand for the idea increased. This was further promoted by the rise of environmental movements and the neo-liberal consensus, as well as by the operations of a 'demonstration effect'. This dissertation contends that once these mechanisms were in operation, the predominance of the idea in the US enabled its adoption as part of the Kyoto Protocol. For the leap from national to international-level policy, the idea required companionship from mechanisms that would ensure credible commitment and cooperation on the international stage.

1. Introduction

A 'market for pollution' – also referred to herein as a marketable permit system or a cap-and-trade scheme – is an economic instrument for reducing pollution levels in a cost-effective manner. Policymakers distribute or sell permits to specify the level of pollution that holders can emit. Permits are traded so that holders reduce their pollution output to the extent that they can afford to do so, given the equilibrium market price of permits. By controlling the available quantity of

permits, policymakers 'cap' the market's total pollution output.[1] This neat and compelling idea was first conceptualised by the economist John Dales in the late 1960s.[2] By the 1990s, it had travelled to become 'almost hegemonic' in economic policy, particularly in the United States (US).[3] 'Markets for pollution' materialised in Real-World policy spaces and were the subject of much theoretical and empirical analysis.[4] Ultimately, an international-level 'market for pollution' was adopted by the Kyoto Protocol in 1997. Some scholars downplay the importance of the resulting instrument, describing it as 'the barest skeleton of a market'.[5] However, notwithstanding its impact on subsequent international-level cap-and-trade schemes, the agreement at Kyoto was highly significant because it was *the pioneering attempt to implement an economic instrument on an international scale.*[6]

Economic instruments are the subject of what this dissertation calls the 'ideas-performativity' literature within the history of economic thought. This literature conceptualises instruments as the 'tools' of economists who acted as problem-solving 'engineers' to an increasing degree from the 1970s onwards.[7] Importantly, these tools are 'non-neutral' with respect to their environment; they have 'performative' effects on society.[8] Performativity, herein, refers to the changes imposed on how an economy operates; that is, economic ideas and their policy applications have the potential to alter the behaviours, perceptions and

[1] Robert N. Stavins, 'Experience with Market-Based Environmental Policy Instruments', in *Handbook of Environmental Economics,* ed. Karl-Göran Mäler and Jeffrey Vincent, vol. I (Amsterdam, Netherlands: Elsevier Science, 2003), 361; David Pearce, 'An Intellectual History of Environmental Economics', *Annual Review of Energy and the Environment* 27, no. 1 (1 November 2002): 74-5, https://doi.org/10.1146/annurev.energy.27.122001.083429.
[2] John H. Dales, *Pollution, Property and Prices: An Essay in Policy making and Economics* (Toronto: Toronto, 1968); Tom Tietenberg, 'Cap-and-Trade: The Evolution of an Economic Idea', *Agricultural and Resource Economics Review* 39, no. 3 (2010): 360, https://econpapers.repec.org/article/agsarerjl/95836.htm.
[3] Michael Grubb, 'The Economics of the Kyoto Protocol', *World Economics 4,* no. 3 (2003): 183, https://EconPapers.repec.org/RePEc:wej:wldecn:153.
[4] Stavins, 'Experience with Market-Based Environmental Policy Instruments', 394.
[5] Donald MacKenzie, 'The Political Economy of Carbon Trading', *London Review of Books,* 5 April 2007, https://www.lrb.co.uk/the-paper/v29/n07/donald-mackenzie/the-political-economy-of-carbon-trading.
[6] Grubb, 'The Economics of the Kyoto Protocol', 143.
[7] Mary S. Morgan, 'Technocratic Economics: An Afterword', *History of Political Economy* 52, no. S1 (2020): 294-6 & 299, https://doi.org/10.1215/00182702-8718067.
[8] Morgan, 'Technocratic Economics: An Afterword', 302.

expectations of economic actors, as well as their institutional and environmental surroundings.[9] In this manner, the ideas-performativity literature links explanations for how economic ideas travel and achieve theory-to-policy transformations to considerations of how those ideas subsequently 'get remade on the ground'.[10]

Given the pioneering history of the 'market for pollution', adopting this idea as a case study provides unique insights for the ideas-performativity literature. In turn, applying framework concepts from that literature to the 'market for pollution' is a novel approach to the history of environmental and ecological economics (HEEE, hereafter). This is inspired by Daniel Speich's study of how the GDP travelled, which he undertook in order to shed new light on the history of development thinking.[11] Likewise, the HEEE literature requires reassessment. Pre-existing contributions are largely written by economists who portray the history of their sub-disciplines as promotive material for the societal importance thereof.[12] The ecological-versus-environmental divide within economics hampers the objectivity of these writers, who tend to critique their opposing sub-discipline.[13] Concomitantly, they (almost) unquestioningly praise the expansion of their sub-disciplines since their 'humble beginnings' in the 1960s and 1970s.[14] As a result, these works often possess a sense of determinism, which limits their analytical interrogation of the HEEE.

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[9] Donald Mackenzie et al., *An Engine, not a Camera: How Financial Models Shape Markets* (Cambridge, United States: MIT Press, 2006), http://ebookcentral.proquest.com/lib/londonschoolecons/detail.action?docID=3338571.
[10] Morgan, 'Technocratic Economics: An Afterword', 303.
[11] Daniel Speich Chassé, 'Traveling with the GDP Through Early Development Economics' History', *The Nature of Evidence: How Well Do Facts Travel? Working Paper*, no. 33/08, SSRN Electronic Journal (September 2008), https://doi.org/10.2139/ssrn.1291058.
[12] Clive L. Spash, 'The Development of Environmental Thinking in Economics', Environmental Values 8, no. 4 (1999): 432, https://www.clivespash.org/wp-content/uploads/2015/04/1999_Spash_EV_Development.pdf; Robert N. Stavins, 'The Evolution of Environmental Economics: A View from the Inside', The Singapore Economic Review 62, no. 02 (June 2017): 270, https://doi.org/10.1142/S0217590816500399.
[13] Nikola Petrović, 'Why Do Environmental and Ecological Economics Diverge? Comparison of the Ideological, Institutional and Scientific Backgrounds of the Main Actors', *Science & Technology Studies* 35, no. 1 (15 February 2022): 36, https://doi.org/10.23987/sts.95175.
[14] Pearce, 'An Intellectual History of Environmental Economics', 78; Stavins, 'The Evolution of Environmental Economics', 251.

Consequently, this dissertation complements a new – albeit sparse – section of the HEEE literature that aims for a more objective and explanatory narrative.[15] This is not the first attempt to apply ideas-performativity-related concepts to environmental matters. Indeed, Naomi Oreskes analyses how climate-change related facts travelled and Marcel Braun considers the importance of knowledge sharing for the development of the European Emissions Trading Directive in the early 2000s.[16] Therefore, the value added herein derives from a new question about the *pre*-Kyoto period, focussing primarily on the US. What can framework concepts from the ideas-performativity literature reveal about how and why the 'market for pollution' travelled, ultimately becoming an international-level policy as part of the Kyoto Protocol? Moreover, how might this case study revise or extend the relevant ideas-performativity frameworks? The analysis first outlines the pre-existing narrative for the pre-Kyoto history of the 'market for pollution'. From this foundation, it applies an analytical framework that draws upon the literatures on 'travelling facts' and economic performativity. The final section considers how the instrument 'went global', introducing a 'quad-variate policymaking framework' to explain its potential for international-level policy.

2. From theory to policy: the HEEE narrative

Amalgamating HEEE studies generates a pre-Kyoto narrative of the 'market for pollution'. Understanding this narrative and its shortcomings enables us to better appreciate the benefits of applying ideas-performativity frameworks. Scholars of the HEEE agree that in the late 1960s and early 1970s there was little enthusiasm

[15] For examples: Petrović, 'Why Do Environmental and Ecological Economics Diverge?', 35-67; H. Spencer Banzhaf, 'A History of Pricing Pollution (or, Why Pigouvian Taxes Are Not Necessarily Pigouvian)', *NBER Working Papers,* National Bureau of Economic Research, no. w27683 (2020), http://www.nber.org/papers/w27683; Nathalie Berta, '3. A Note on John Dales and the Early History of Emissions Trading: Mixing Standards and Markets for Rights', *Cahiers d'économie politique* 79, no. 1 (2021): 61–84, https://doi.org/10.3917/cep1.079.0061.

[16] Naomi Oreskes, 'My Facts Are Better Than Your Facts: Spreading Good News about Global Warming', *in How Well Do Facts Travel?: The Dissemination of Reliable Knowledge, ed*. Mary S. Morgan and Peter Howlett (Cambridge: Cambridge University Press, 2010), 136–66, https://doi.org/10.1017/CBO9780511762154.008; Marcel Braun, 'The Evolution of Emissions Trading in the European Union – The Role of Policy Networks, Knowledge and Policy Entrepreneurs', Accounting, Organizations and Society 34, no. 3 (1 April 2009): 469–87, https://doi.org/10.1016/j.aos.2008.06.002.

for the idea, due to political and ethical issues associated with selling licenses to pollute.[17] Moreover, economics *in general* was often 'ignored' by environmental policy.[18] Limited levels of economic literacy reinforced policymakers' preference for command-and-control regulations.[19] Among polluters, distrust of economics-based approaches stemmed from the overriding idea of a pollution tax, which diminished the popularity of associated instruments.[20] Concomitantly, environmental-economic ideas lacked sufficient theoretical backing.[21]

Between 1974 and 1979, the U.S. Environmental Protection Agency amended its Clean Air Act (CAA), transforming the programme into a 'market for pollution'. An 'offset policy' enabled new polluting sources to enter areas that were failing to meet CAA targets for ambient air quality, given that older sources relinquished entitlements to emit. Offsets could be traded, and credits from emissions reductions could be 'banked' for future use.[22] Pre-existing explanations for this first major implementation emphasise historical contingency and political necessity. Tom Tietenberg and Wallace Oates argue that the 'political opportunity' that presented itself when some regions failed to meet the CAA standards, along with the political appeal of avoiding a 'virtual cessation of economic growth', resulted in the first Real-World market for emissions.[23] Similarly, Robert Hahn describes the amendments as politics-driven: the new scheme granted flexibility to polluters and appeased environmentalists who disapproved of 'rights to pollute', because it '[deemphasised] the explicit nature of the property right' via provisions for between-firm trades.[24]

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[17] Nathalie Berta, '3. A Note on John Dales', 78-9; Wallace E. Oates, 'From Research to Policy: The Case of Environmental Economics', *International Journal of Urban Sciences* 4, no. 1 (1 April 2000): 6, https://doi.org/10.1080/12265934.2000.9693458.
[18] Oates, 'From Research to Policy', 3.
[19] Tom Tietenberg, 'Cap-and-Trade', 359; Oates, 'From Research to Policy', 3 & 5; Steven Kelman, *What Price Incentives? Economists and the Environment* (Boston, Mass.: Auburn House, 1981), 96.
[20] Oates, 'From Research to Policy', 3.
[21] Oates, 'From Research to Policy', 4.
[22] Oates, 'From Research to Policy', 6; Tietenberg, 'Cap-and-Trade', 361-2; Robert W. Hahn, 'Economic Prescriptions for Environmental Problems: How the Patient Followed the Doctor's Orders', *Journal of Economic Perspectives* 3, no. 2 (1989): 99, https://doi.org/10.1257/jep.3.2.95.
[23] Tietenberg, 'Cap-and-Trade', 361; Oates, 'From Research to Policy', 6.
[24] Hahn, 'Economic Prescriptions for Environmental Problems', 101.

For the subsequent period, Hahn identifies three other applications of marketable permits by 1989. These include: a market for discharging pollution into the Wisconsin Fox River that was established in 1981; allowances for inter-refinery lead trading in the US between 1982 and 1987; and air pollution trading in Germany around the same time.[25] He argues that these instruments were considered 'innovative' methods to generate cost savings and to grant flexibility to polluters, enabling them to adjust to diminishing pollution levels.[26] However, the HEEE literature often overlooks these examples. Instead, scholars emphasise what is often described as the first national *successful* market for emissions, the sulphur allowance programme that was established in the US in 1990. This programme is praised because it achieved the environmental target set – sulphur emissions were cut by fifty per cent in its first decade – and because it was an active and efficient market.[27] To explain how the sulphur emissions market materialised, scholars emphasise what Hahn labels the 'demonstration effect'; the CAA's emissions trading showed that 'markets for pollution' were feasible and provided lessons for practical implementations thereof.[28]

There are some deeper elements of explanation in this literature that are worthy of note. Indeed, scholars of the HEEE acknowledge that 'the tale is certainly not a simple one in which environmental economists presented a superior policy alternative'.[29] They emphasise elements such as socio-political change, the expansion of environmental economics and a general increase in economic literacy. Therefore, this dissertation does not deny that combining strands of the HEEE literature can provide a rather comprehensive narrative for the emergence of 'markets for pollution' between 1970 and the early 1990s. However, merely combining these strands – which this dissertation achieves as a by-product of its broader aims – remains insufficient in light of their shortcomings.

[25] Hahn, 'Economic Prescriptions for Environmental Problems', 97-8 & 101-3.
[26] Hahn, 'Economic Prescriptions for Environmental Problems', 95, 97 & 101.
[27] Oates, 'From Research to Policy', 2 & 12; Tietenberg, 'Cap-and-Trade', 362-3.
[28] Hahn, 'Economic Prescriptions for Environmental Problems', 112; Oates, 'From Research to Policy', 8 & 12.
[29] Oates, 'From Research to Policy', 11.

The existing works link the merits of the idea to its political convenience, but their analysis of this interaction is brief and often disjointed. There is more to be said here, and the story is more interwoven than they imply. Indeed, scholars reference the 'flexibility' granted by the concept, but they inadequately explain this characteristic, underappreciating its true implications for the idea's travels.[30] Moreover, the literature has not yet explicitly considered the performative change induced by the implementation of 'markets for pollution' and how this *fed back* into the idea's reception. In general, the HEEE literature has not yet produced a work that: 1) considers these mechanisms and that 2) effectively balances *both* the broader socio-political context and more specific, 'zoomed-in' factors related to the idea itself.

3. How ideas travel: framework concepts from 'travelling facts' studies.

Striving to meet these requirements, this dissertation adopts concepts from studies on how 'facts' travel. Morgan defines a 'fact' as 'shared pieces of knowledge' that are 'autonomous, short, specific and reliable' and independent of their initial 'explanations, causes and motivations'.[31] 'Travelling' is defined as the communication or transportation of facts from their places of origin to new contexts; they could move geographically, across time, or between academic disciplines. They travel *well* if their content remains intact in a new context – that is, if they travel 'with integrity' – or if they travel 'fruitfully', so that they gain new users, take on new functions and create new narratives.[32] A rubber ball is a useful analogy here: like well-travelled facts, they have many uses and can be 'bounced, kicked and thrown without harm to them'.[33] For example, architectural styles from

[30] Hahn, 'Economic Prescriptions for Environmental Problems', 98, 101 & 103; Erhun Kula, *History of Environmental Economic Thought* (London, United Kingdom: Taylor & Francis Group, 1998), 107; Robert N. Stavins, 'The Problem of the Commons: Still Unsettled after 100 Years', American Economic Review 101, no. 1 (2011): 93 & 101, https://doi.org/10.1257/aer.101.1.81; T. H. Tietenberg, 'Economic Instruments for Environmental Regulation', *Oxford Review of Economic Policy* 6, no. 1 (1990): 31, https://www.jstor.org/stable/23606112.

[31] Mary S. Morgan, 'Travelling Facts', in *How Well Do Facts Travel?: The Dissemination of Reliable Knowledge*, ed. Mary S. Morgan and Peter Howlett (Cambridge: Cambridge University Press, 2010), 8-9, https://doi.org/10.1017/CBO9780511762154.003.

[32] Morgan, 'Travelling Facts', 12.

[33] Morgan, 'Travelling Facts', 15.

Ancient Greece were facts that travelled well; they emerged in new, productive contexts as part of European and American buildings many centuries later.[34]

'Facts' are distinct from 'ideas', but they share enough similarities to justify adopting the 'travelling' framework to investigate how *ideas* travel. Indeed, policy adoptions of the 'market for pollution' can be understood independently of Dales' motivations and the instrument has changed in purpose and scope. Nevertheless, its integrity remained intact; the same fundamental cap-and-trade mechanism was at the core of each of the aforementioned policy implementations. Since this dissertation focusses on an economic idea rather than on what Morgan defines as a 'fact', greater emphasis is placed on travel between theory and policy. To a large extent, this is how the concept of an idea travelling 'fruitfully' – and thereby travelling well – is interpreted herein. Our key question remains: why did the 'market for pollution' travel as it did, effectively becoming policy in a variety of contexts and ultimately forming part of the Kyoto Protocol?

To the benefit of this investigation, 'travelling facts' studies suggest why certain facts or ideas travel better than others. The following criteria are emphasised. Ideas travel well when there is demand for them and they meet little resistance.[35] Secondly, their travels are aided by their possession of 'character', which might spark interest in or demand for the idea. For instance, they may be associated with adjectives such as 'fascinating', 'adaptable' or 'important'.[36] Finally, an idea will travel well with good 'companions', which is a broad concept that includes factors such as strong empirical evidence, financial resources, contingent historical events, or an association with authoritative institutions.[37] To understand these criteria, consider a counterargument to greenhouse-gas-induced global warming that travelled well in the US in the 1980s. Industry groups such as the Western Fuels Association promoted the 'fact' that carbon dioxide emissions *benefit* our

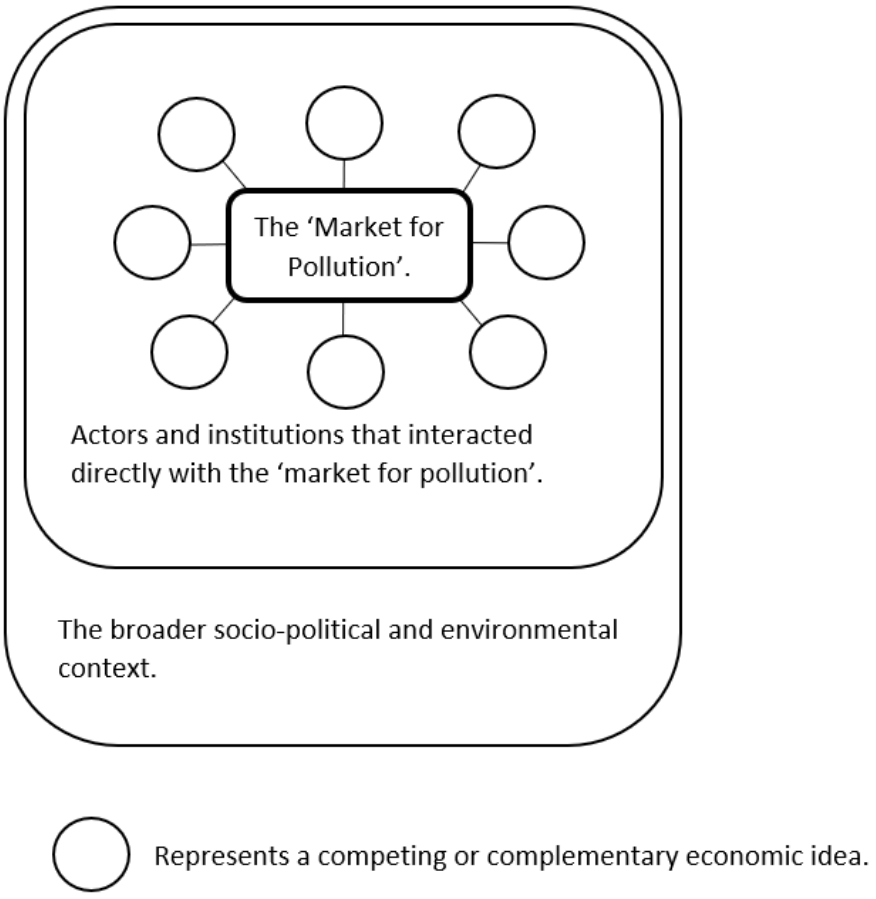
[34] Morgan, 'Travelling Facts', 18.
[35] Morgan, 'Travelling Facts', 30.
[36] Morgan, 'Travelling Facts', 33-5.
[37] Morgan, 'Travelling Facts', 25-30.

environment by enhancing photosynthesis.[38] This 'fact' met the travelling-well criteria. It had good 'companions'; industry leaders funded a major public campaign to support the counterargument's travels.[39] Moreover, Oreskes suggests that there was strong demand for the 'fact' due to its 'good-news' character. People wanted a counterargument to climate-change pessimism and industry figures were comforted by the protection it granted to their economic position.[40]

These travelling-well criteria reveal the importance of an interaction between the following categories of analysis: characteristics of the idea itself, competing and complementary ideas, the actors and institutions that carried or obstructed the idea, and broader socio-political factors. In combination, these categories determine the level of demand for an idea, create or constitute an idea's travel 'companions' and shape perceptions of an idea's 'character'. Returning to the above example, the dismal outlook of scientists' competing ideas about global warming enhanced the 'good-news' character of the industry groups' counterargument, and the socio-economic power of these groups in the US enhanced their position as good 'companions'. These categories are therefore adopted for the analytical framework herein, depicted in Figure 1. This dissertation considers the impact of each category in turn on why and how the 'market for pollution' met – or did not meet – the travelling-well criteria, focussing on the US.

[38] Oreskes, 'My Facts Are Better Than Your Facts', 137-8.
[39] Oreskes, 'My Facts Are Better Than Your Facts', 138 & 156.
[40] Oreskes, 'My Facts Are Better Than Your Facts', 155-8.

Figure 1: The interaction that determined how the 'market for pollution' travelled.



4. Characteristics of the 'market for pollution'

Three principal characteristics of the 'market for pollution' generated demand for its adoption, endowed it with strong 'character' and motivated agents to act as 'good companions'. These include: the idea's flexibility, manipulability and congruity with prevailing economic concepts and policymaking paradigms. This dissertation valuably turns away from the HEEE literature's emphasis on what an *environmental economist* would consider to be the idea's key merits. Many scholars emphasise the cost-effectiveness of a 'market for pollution' policy and its potential to stimulate technological change.[41] These merits align with the

[41] Tietenberg, 'Cap-and-Trade', 361; Pearce, 'An Intellectual History of Environmental Economics', 73; Stavins, 'The Problem of the Commons', 94; Robert N. Stavins, 'The Evolution of Environmental Economics', 260; *Kula, History of Environmental Economic Thought*, 107.

economic theory behind the idea itself; they were consequently critical for its fruitful travels and, in particular, for the good companionship of economists. However, the key merits of the idea *as an economist would describe them* were not always the most important characteristics for determining how it travelled. Indeed, in his analysis of late-twentieth-century environmental policy debates, Jason Shogren finds that basic economic principles were often neglected in favour of political considerations.[42]

Where the HEEE literature praises the 'flexibility' of a 'market for pollution', scholars primarily refer to the instrument's allowance for firms to exchange permits; this theoretically enabled the 'capped' level of pollution to be achieved in a cost-effective manner.[43] However, in practice this exchange did not always take place according to economists' designs. For instance, after the introduction of marketable permits as part of the CAA, there were very few trades between firms; most 'trades' were internal. The performative success of market-based 'flexibility' was limited. This is especially the case in comparison with the lead trading scheme of the 1980s, which Hahn describes as coming 'by far the closest to the economist's ideal of a freely functioning market'.[44] Consequently, a different form of flexibility possessed by the 'market for pollution' was just as important for its travels: the core concept could be applied in a variety of forms to suit contextual circumstances. Often, policymakers did not implement a 'market for pollution' as economists would have conceived of one; indeed, policymakers would rarely sell permits, finding it more pragmatic to distribute them for free.[45] In this manner, the idea achieved a larger variety of Real-World implementations and yet was still recognised as a 'market for pollution'.[46] This contributed to the 'demonstration effect' which this dissertation will later explore and portray as a critical determinant of the idea's travels.

[42] Jason Shogren, 'A Political Economy in an Ecological Web', *Environmental & Resource Economics* 11, no. 3 (1998): 568.
[43] Hahn, 'Economic Prescriptions for Environmental Problems', 98-9.
[44] Hahn, 'Economic Prescriptions for Environmental Problems', 100-1.
[45] MacKenzie, 'The Political Economy of Carbon Trading', 5-6.
[46] Hahn, 'Economic Prescriptions for Environmental Problems', 97.

A 'market for pollution' also grants flexibility to policymakers, who control the availability of permits. This manipulability was an important demand-generating factor. Indeed, pollution taxes are less manipulable; industry resistance to a tax rise would be expected to be greater than that towards a restriction in permit availability. Also, polluters' responses to a tax change are unpredictable, so that the actual level of pollution remains uncertain. Considering the 'political losers' hypothesis, an idea from economic historians of institutional change, further reveals the importance of this manipulability. Daron Acemoglu and James Robinson stipulate that actors resist technological change that could undermine their political power, but they facilitate or permit change that enables them to maintain that power.[47] Environmental policymakers of the 1970s and 1980s were power-holders: they were accustomed to command-and-control policies that enabled them to fully control pollution levels. Around this time, environmental economists lamented the fact that the 'typical non-economist leans toward the direct regulation of quantities'.[48] Indeed, a key industry lobbyist claimed that 'EPA bureaucrats would stop [the implementation of pollution charges], because [it] would threaten their power'.[49] In this light, policymakers' preference for a policy that enables them to retain control over pollution levels seems highly important.

Tentatively, I suggest that this hypothesis could also explain why the same policymakers in the US often rejected the efficiency criterion for environmental standards. Economic theory dictates that the efficient level of pollution is that at which the aggregate social benefit from setting the standard is equal to the social costs. This criterion was highly controversial as late as the 1990s among policymakers in the US; the Clinton administration in particular avoided surrendering environmental-standards-setting to economic analysts.[50] Hahn, Sheila Olmstead and Robert Stavins explain this hesitancy, focussing mainly on

[47] Daron Acemoglu and James A. Robinson, 'Political Losers as a Barrier to Economic Development', *American Economic Review* 90, no. 2 (2000): 126, https://doi.org/10.1257/aer.90.2.126.
[48] Martin L. Weitzman, 'Prices vs. Quantities', *The Review of Economic Studies* October, 41, no. 4 (1974): 477.
[49] Steven Kelman, *What Price Incentives?,* 122.
[50] Robert W. Hahn, Sheila M. Olmstead, and Robert N. Stavins, 'Environmental Regulation in the 1990s: A Retrospective Analysis', *Harvard Environmental Law Review 27* (2003): 377-8.

politicians' ideological motivations and political expediency.[51] The 'political losers' hypothesis implies a complementary explanation: accepting the efficiency criterion as the 'correct' method would mean surrendering control over environmental standards to economic analysis.

Therefore, policymaking aims were generally aligned with cost-effectively achieving a specified environmental standard rather than with economic efficiency. As explained above, the 'market for pollution' was predominantly characterised as cost-effective. The instrument was consequently congruous with prevailing policymaking paradigms, facilitating the emergence of demand for its travels. Moreover, 'markets for pollution' were perceived as congruous with economic growth, another dominant paradigm of the period. Dales himself argued for instruments such as a 'market for pollution' in order to counter claims that curbing economic growth may become necessary to control pollution.[52] The 'market for pollution' idea therefore travelled better than any growth-curbing policy options.[53] Finally, the idea was congruous with pre-existing neo-classical economic concepts, via its emphasis on property rights and market-based efficiency. These foundations encouraged demand for the idea's travels among groups that subscribed to mainstream economics. To illustrate this point, the 'market for pollution' can be contrasted with ecological-economic ideas, which were ultimately relegated to a subordinate position within both American and European institutions. These ideas were based on an integration of ecology with a critique of economic orthodoxies; this heterodox foundation hampered the ease with which they could travel.[54]

[51] Hahn, Olmstead, and Stavins, 384-5 & 407.
[52] Dales, *Pollution, Property and Prices,* 108 & 110.
[53] Oates, 'From Research to Policy', 7; Tietenberg, 'Cap-and-Trade', 361-2.
[54] Petrović, 'Why Do Environmental and Ecological Economics Diverge?', 45, 49 & 50-2.

5. The actors and institutions that interacted directly with the 'market for pollution'

The idea's characteristics were important, but its travel depended critically on the agents with whom it interacted. Indeed, actors and institutions directly shaped – and often constituted – the demand and companionship for the idea. The ideas-performativity scholar Evelyn Forget categorises agents that interact directly with economic knowledge into three groups: knowledge producers, users, and brokers.[55] These categories assist this dissertation's analysis, given that a fourth category is added: knowledge resisters. Herein, producers are the economists who conducted research and advised policymakers on market-based environmental policies. Users of the idea include policymakers, businesses, and economic agents whose behaviours or mindsets were altered by their understanding of 'markets for pollution'. Knowledge brokers communicated the idea from producers to users and transferred any demand for or responses to 'markets for pollution' in the opposite direction; these were the 'companions' with which the idea travelled.[56] Finally, knowledge resisters opposed the idea, actively obstructing its travels or promoting competing ideas that might do the same. Agents and institutions connected to all four categories interacted, supplying, demanding, accompanying, or obstructing the idea's travels.

From the 1970s onwards, there was a significant expansion of producers and brokers of 'market-for-pollution'-related knowledge. Moreover, the capacity of these agents to process strong and well-evidenced knowledge improved; they became more capable 'companions'.[57] These developments were linked to the expansion and institutionalisation of environmental economics. The maturing of this sub-discipline is explained by scholars of the HEEE: the discipline was formalised with the establishment of the *Journal of Environmental Economics and Management* in 1974 and the Association of Environmental and Resource

[55] Evelyn L. Forget, '2018 HES Presidential Address: Folk Wisdom in Economics', *Journal of the History of Economic Thought* 42, no. 1 (March 2020): 2, https://doi.org/10.1017/S1053837219000580.
[56] Forget, '2018 HES Presidential Address', 1-3.
[57] Oates, 'From Research to Policy', 4; Petrović, '*Why Do Environmental and Ecological Economics Diverge?', 52.*

Economists five years later.[58] These institutions united the discipline, and it continued to expand: in the early 1990s there was a rapid increase in the number of journals applying economic ideas to environmental issues. Institutionalisation spread to Europe with the establishment of the European Association of Environmental and Resource Economists.[59] These institutions facilitated and encouraged analysis of the idea, ultimately endowing it with sufficient theoretical backing to convince policymakers of its potential.[60] Certain characteristics of the sub-discipline also enhanced its effectiveness as a travel 'companion'. In her explanation for the relative dominance of environmental over ecological economics, Nikola Petrović contrasts the 'partitioned bureaucracy' structure and strong institutional stability of the former with the 'fragmented adhocracy' of the latter.[61] The unity and stability of environmental economics supported continuous, accumulative work that enabled ideas to achieve maturity.

These producers were not the sole source of impetus for the idea's travels. As one such producer, Stavins claims that his involvement with knowledge-*using* policymakers often drove him to research new aspects of environmental economics. In 1988, as part of the preparation for George Bush's presidential campaign, two senators met with Stavins to request that he direct a research project into innovative approaches to environmental protection. The resulting report led to the CAA amendments of 1990, which established the sulphur dioxide cap-and-trade system. Stavins claims that prior to this project, he 'had never carried out scholarly research on market-based instruments'. Subsequently, this research agenda expanded rapidly; this reveals the importance of two-way interactions between knowledge users and producers on the travels of ideas such as the 'market for pollution'.[62]

[58] Nikola Petrović, *'Why Do Environmental and Ecological Economics Diverge?*', 51.
[59] Spash, 'The Development of Environmental Thinking in Economics', 420.
[60] Oates, 'From Research to Policy', 8.
[61] Petrović, *'Why Do Environmental and Ecological Economics Diverge?*', 51.
[62] Robert N. Stavins, 'The Evolution of Environmental Economics', 259.

As intermediaries of this 'two-way' relationship, knowledge brokers are worthy of attention. In the late 1970s, political scientist – and economic-knowledge broker – Steven Kelman surveyed policymakers and environmentalists to better understand attitudes towards market-based instruments. He communicated his findings to economists, along with a proposed strategy to persuade for the instruments' acceptance.[63] Kelman's survey also revealed brokerage work undertaken by individuals acting upon larger organisations; Gary Knight, environmental lobbyist for the US Chamber of Commerce, declared his willingness to 'work' for market-based instruments' acceptance within the Chamber.[64] As economic literacy rose towards the end of the twentieth century, 'companions' such as Kelman and Knight could raise demand for 'markets for pollution' with greater ease.[65] A better understanding of economics reduced moral-based objections to market-based instruments and improved brokers' ability to communicate their economic benefits. This demand was further influenced by the 'demonstration effect' and broader socio-political change, as will be explained below.

It may seem contradictory, but agents and institutions that *resisted* the travels of the 'market for pollution' frequently had a *positive* effect on the idea's ultimate ability to travel. Fruitful interactions between resisters and producers are important; where resistance to the economic idea was met, this stimulated more rigorous economic analysis, endowing the idea with stronger theoretical backing.[66] For example, in a highly influential paper, Martin Weitzman identified the widespread dismissive attitude towards 'market-for-pollution'-type schemes in the early 1970s as a key motivation for his work on market-based instruments.[67] Similarly, an article by Stavins and Don Fullerton that delineates 'markets for pollution' in an accessible manner was motivated by a discussion at a dinner party.[68] Talking to an anthropologist, Stavins was motivated by the 'hostile'

[63] Kelman, *What Price Incentives?,* 125-50.
[64] Kelman, *What Price Incentives?,* 122.
[65] Oates, *'From Research to Policy'*, 8.
[66] Spash, *'The Development of Environmental Thinking in Economics',* 421.
[67] Weitzman, *'Prices vs. Quantities'*, 477.
[68] Don Fullerton and Robert Stavins, 'How Economists See the Environment', Nature 395 (1 October 1998), https://doi.org/10.1038/26606.

attitude of the scholar towards economic approaches to environmental issues.[69] Proponents of competing ideas can also be interpreted as knowledge resisters; proponents of *The Limits to Growth* in early-1970s Britain motivated economists such as David Pearce to strengthen the theory behind the competing notion of sustainable economic growth. This contributed to Pearce's research on market-based instruments in the late 1980s.[70]

6. The broader socio-political and intellectual contexts

Knowledge producers, users, brokers, and resisters interacted with the idea under socio-political and intellectual influences. This altered the ideas' travels: the broader context affected users' demand levels and shaped how 'companions' operated. In the HEEE literature, the expansion of the environmental movement from the 1960s onwards is potentially the most referenced element of this context. This movement generated demand for the idea, as well as encouraging knowledge creation related to 'markets for pollution'. For example, the movement influenced an environment-oriented drive in Margaret Thatcher's government in the late 1980s. This resulted in a fruitful user-producer interaction with Pearce, who was motivated to publish influential works on market-based environmental policies.[71] The environmental movement also encouraged the aforementioned institutionalisation of environmental economics; Clive Spash suggests that the revival of popular environmentalism in the late 1980s was the key cause of the sub-discipline's institutionalisation in Europe.[72]

Crucially, these developments coincided with the rise of the neo-liberal consensus. This consensus held markets in high esteem as the solution for many socio-economic problems; it consequently granted 'markets for pollution' with authoritative 'character' and acceptance. Oates suggests that a neo-liberal consensus among US policymakers was a crucial determinant of the shift from

[69] Stavins, 'The Evolution of Environmental Economics', 257.
[70] Petrović, 'Why Do Environmental and Ecological Economics Diverge?', 47.
[71] Petrović, 'Why Do Environmental and Ecological Economics Diverge?', 47.
[72] Spash, 'The Development of Environmental Thinking in Economics', 420.

scepticism in the early 1970s to widespread support for market-based policy instruments in the 1990s.[73] Indeed, the election of Ronald Reagan in 1980 ripened the political environment for such instruments.[74] Moreover, neo-liberalism could influence environmental policy on a global scale from its dominant position within international institutions by the late 1980s.[75] For example, the action plan for sustainable development from the United Nations Conference on Environment and Development (UNCED) listed as one of its key objectives in 1992: 'to include, wherever appropriate, the use of market principles in the framing of economic instruments and policies to pursue sustainable development.'[76]

7. The 'demonstration effect' through the lens of performativity

Travel-promoting interactions between the analytical categories depicted in Figure 1 were accompanied by the 'demonstration effect'. Via this effect, where a 'market for pollution' was successfully implemented, the employment of the instrument in new contexts became more likely. HEEE scholars identify two parallel mechanisms for this effect. Firstly, the instrument's attainment of its implementors' goals signals its potential. Secondly, policy implementation enables knowledge-producing actors to better understand how to design and use the instrument in practice.[77] This dissertation contends that the idea's implementation had other, as yet unidentified, effects on the interactions analysed herein. These extensions of the 'demonstration effect' become clear when one considers economic performativity.

Earlier implementations of the 'market for pollution' did more than merely demonstrate its effectiveness. They had a performative effect, changing how knowledge brokers and users *perceived* environmental policies. The interactive

[73] Oates, 'From Research to Policy', 8-9.
[74] Kelman, *What Price Incentives?,* 150.
[75] David Harvey, *A Brief History of Neoliberalism* (Oxford: Oxford University Press, Incorporated, 2007), 3 & 92-3, https://doi.org/10.1093/019162294X.001.0001.
[76] Lynley Tulloch and David Neilson, 'The Neoliberalisation of Sustainability', *Citizenship, Social and Economics Education* 13, no. 1 (1 March 2014): 34, https://doi.org/10.2304/csee.2014.13.1.26.
[77] Shogren, 'A Political Economy in an Ecological Web', 568; Hahn, 'Economic Prescriptions for Environmental Problems', 112; Tietenberg, 'Cap-and-Trade', 366.

framework depicted in Figure 1 has revealed the importance of congruity of prevailing policymaking paradigms, pre-existing economic ideas, ideological consensuses, and institutional environments with the 'market for pollution' for the fruitful travels thereof. This congruity was enhanced by the policy's performativity, thus contributing to the 'demonstration effect' via an additional channel. As ecological economists have asserted, 'markets for pollution' are 'not ideologically neutral'; they adhere to the perception of our environment as a marketable commodity that can be bought and sold as property. Consequently, as they began to be implemented, their material operations altered actors' perceptions of environmental problems in this way.[78] The ideological consensus became *more congruous* with the idea itself. Indeed, it is possible that, since they are built upon neo-classical assumptions of individualistic and rational behaviour, 'markets for pollution' altered the ideological perceptions of those who interacted with its mechanisms. In this way, demand for the idea expanded as these groups and individuals began to consider environmental problems to be solvable by individualistic, price-based incentives.[79]

Performative change also took place on an institutional level. Petrović suggests a similar mechanism to Hahn's 'demonstration effect' wherein the implementation of environmental-economic ideas in practice represented the sub-discipline's seizure of 'opportunity structures' to better establish itself.[80] This fed-back into the institutionalisation and formalisation of environmental economics, creating conditions that improved the idea's fulfilment of the travelling-well criteria. For instance, as their ideas were adopted, environmental economists became more present in international institutions such as the World Bank; this encouraged more economists to join the field, produce supporting knowledge and become good 'companions'.[81] Moreover, the 'market for pollution' promoted ideas of private

[78] Erik Gómez-Baggethun et al., 'The History of Ecosystem Services in Economic Theory and Practice: From Early Notions to Markets and Payment Schemes', *Special Section - Payments for Environmental Services: Reconciling Theory and Practice* 69, no. 6 (1 April 2010): 1215-6, https://doi.org/10.1016/j.ecolecon.2009.11.007.
[79] Arild Vatn, 'Rationality, Institutions and Environmental Policy', *Ecological Economics* 55, no. 2 (1 November 2005): 214–5, https://doi.org/10.1016/j.ecolecon.2004.12.001.
[80] Petrović, 'Why Do Environmental and Ecological Economics Diverge?', 39 & 46.
[81] Petrović, 'Why Do Environmental and Ecological Economics Diverge?', 48-9.

property in relation to environmental assets, contributing to the expanding trend of placing monetary values on eco-system services and 'measuring' environmental amenities via processes such as the calculation of green national income accounting.[82] This strengthened the constellation of complementary environmental-economic ideas, which fed-back into promoting agents' perceptions of the legitimacy and normalcy of 'markets for pollution'.

8. International-level policy implementation: the climate-change paradigm and a quad-variate policymaking framework

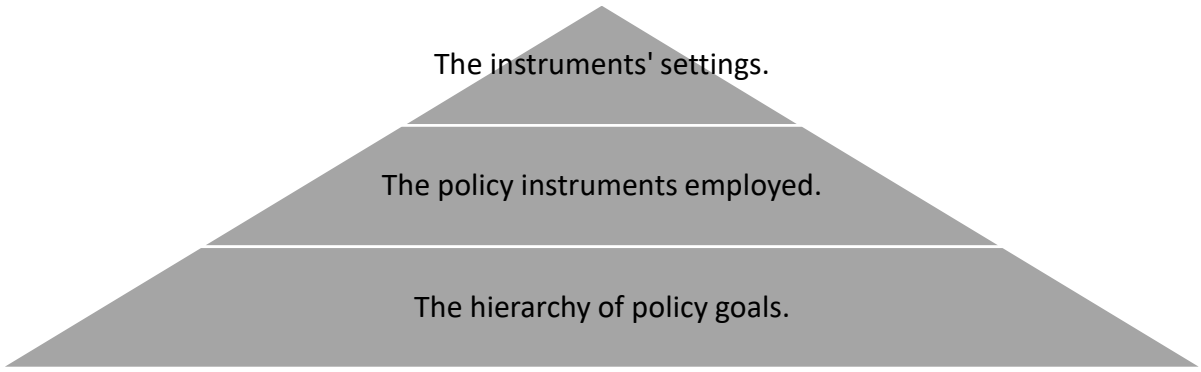
Despite just a few Real-World policy implementations centred in the US, the 'market for pollution' had travelled sufficiently for its implementation as part of the Kyoto Protocol: the Protocol introduced quantified commitments to control emissions, supported by emissions trading among industrialised nations and economies in transition.[83] So far, ideas-performativity concepts have facilitated an explanation of the idea's travels. This is a critical foundation for explaining the international-level implementation of the idea, but the final leap from national- to international-level policy requires more than the travelling-well criteria and our Figure-1 categories. It is necessary to consider this leap as part of a specific international policymaking process.

This process is explained via an ideas-performativity framework from the political scientist Peter Hall. This is referred to as the tri-variate policymaking framework and is depicted in Figure 2. Hall identifies three 'variables' of policymaking: the 'hierarchy of goals behind policy', the policy instrument used to attain these goals, and the settings of those instruments.[84] Any given co-occurrence of these three variables is referred to as a policy paradigm. One such paradigm that occurred in

[82] Philip Lawn, 'A Stock-Take of Green National Accounting Initiatives', *Social Indicators Research* 80, no. 2 (2007): 427–60; Gómez-Baggethun et al., 'The History of Ecosystem Services in Economic Theory and Practice', 1214-5.
[83] Tietenberg, 'Cap-and-Trade', 363.
[84] Peter A. Hall, 'Policy Paradigms, Social Learning, and the State: The Case of Economic Policymaking in Britain', *Comparative Politics* 25, no. 3 (April 1993): 278-9, https://doi.org/10.2307/422246.

the US in the 1990s was the combination of: 1) the goal to curb acid rain; 2) the sulphur dioxide trading programme as the chosen instrument; and 3) the settings of the instrument, which constituted the choice of a fifty per cent reduction in emissions from their 1980 level among other decisions, such as how permits were distributed.[85]

Figure 2: Peter Hall's tri-variate policymaking framework.



In his analysis of a *national* policy paradigm change, Hall suggests the following three statements. Firstly, paradigm change is more likely to be the product of sociological and political, rather than scientific, factors. Secondly, the process of paradigm change will depend on contests of authority between proponents of the incumbent and contesting paradigms. Building upon the analysis herein, this can be interpreted in terms of the power dynamics between an idea's 'companions' and its resisters. Finally, Hall stipulates that persistent failures of a pre-existing policy paradigm would undermine its authority – thus dampening its 'character'.[86] Hall's framework was published prior to the Kyoto Protocol; it is therefore unsurprising that it does not consider economic policymaking on an international scale. However, we can extend his framework to explain the pioneering international 'market for pollution'.

[85] G T Svendsen, 'The US Acid Rain Program: Design, Performance, and Assessment', *Environment and Planning C: Government and Policy* 16, no. 6 (1 December 1998): 723–34, https://doi.org/10.1068/c160723.
[86] Hall, 'Policy Paradigms, Social Learning, and the State', 280.

The Kyoto Protocol is interpreted as part of a global paradigm shift. Importantly, this was preceded by the advent of a new, global hierarchy of goals: combatting climate change appeared on the global agenda. Widespread scientific concern about global warming spread from the late 1970s. Between 1985 and 1988, climate change became a policy issue and heavy governmental involvement on the matter emerged thereafter.[87] Policymakers' goals had changed globally, creating the foundations for international-level paradigm change. In line with Hall's suggestions, this awareness was accompanied by an acknowledgement that the pre-existing paradigm – characterised by the absence of international-level controls on greenhouse gas emissions – was failing. As climate-oriented goals emerged, policymakers demanded more research around instruments such as 'markets for pollution'. In the 1990s, economists such as Pearce explored the application of the 'market for pollution' to an international context. As a good 'companion', this research benefitted a new set of knowledge users within the climate-change regime – international organisations such as the Intergovernmental Panel on Climate Change.[88]

As Hall emphasises, issues of authority were central to the choice of instrument employed by this new paradigm. Two sources of authority contributed to the adoption of a trading scheme: the authority of the idea itself and the authority of its proponents, which were primarily from the US delegation. The former source of authority derives from the interaction that has hitherto been the main focus of our analytical framework. This interaction had generated great 'enthusiasm' for 'markets for pollution', particularly in the US.[89] Exhibiting good companionship, the US administration promoted the idea at the Kyoto Conference. This delegation's political strength, combined with the relative weakness of any

[87] Daniel Bodansky, 'The History of the Global Climate Change Regime', *in International Relations and Global Climate Change*, ed. Urs Luterbacker and Detlef F. Sprinz (Cambridge, Mass.: MIT Press, 2001), 23-4.
[88] Petrović, 'Why Do Environmental and Ecological Economics Diverge?', 47.
[89] Tietenberg, 'Cap-and-Trade', 366.

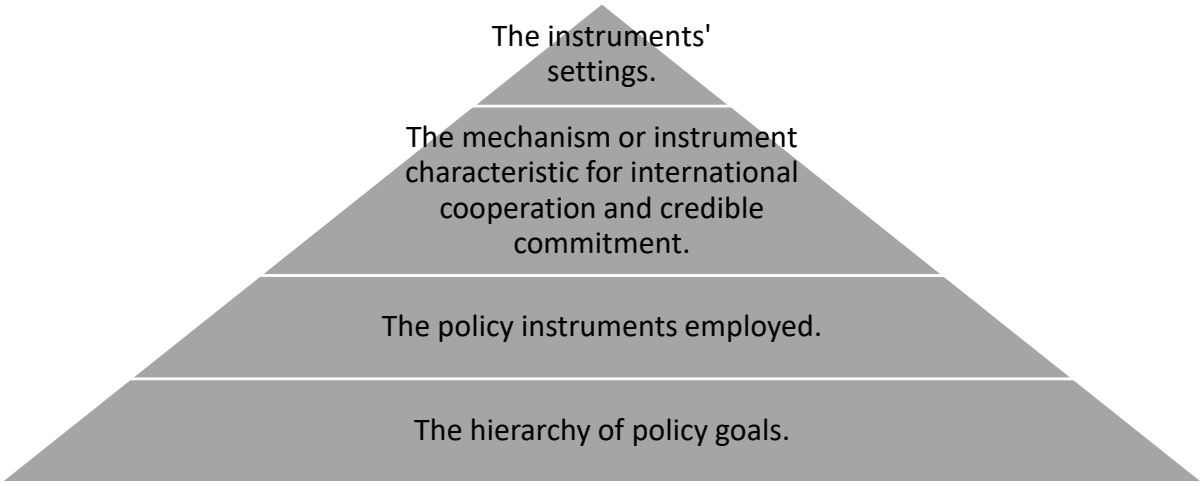
competing ideas, ultimately resulted in the inclusion of emissions trading within the Protocol.[90]

For international-level policymaking, however, the three variables of Hall's framework are incomplete. For a given paradigm, an instrument-settings combination will fail to achieve its associated policy goals in the absence of a *mechanism or instrument characteristic that can generate international cooperation and credible commitment*. This suggests that an international-level policy paradigm requires a fourth variable; the extended, quad-variate policymaking framework is depicted in Figure 3. At Kyoto, there was a strong need for one such mechanism or instrument characteristic to accompany the 'market for pollution'. The European Union was anxious that the US would avoid domestic action, and developing countries feared that the US would take advantage of weaker participants.[91]

The HEEE literature can reveal which mechanisms were implemented as the 'fourth variable' at Kyoto, convincing policymakers of the potential for cooperation and commitment in the resulting market. Firstly, the market itself was largely characterised as experimental.[92] This 'character' reduced the political stakes for policymakers to cooperate by reinforcing perceptions of an *impermanent* emissions market. Secondly, accompanying mechanisms were introduced to generate cooperation and commitment. The Clean Development Mechanism was implemented to facilitate the transition of developing countries towards sustainability. This supplementary mechanism allowed developed countries to invest in developing-country emissions reductions in return for emission credits. It is a further example of the flexibility of the 'market for pollution' concept.[93]

[90] Hahn, Olmstead, and Stavins, 'Environmental Regulation in the 1990s', 399; Grubb, 'The Economics of the Kyoto Protocol', 183-4.
[91] Grubb, 'The Economics of the Kyoto Protocol', 153.
[92] Michel Callon, 'Civilizing Markets: Carbon Trading between in Vitro and in Vivo Experiments', *Accounting, Organizations and Society* 34, no. 3 (1 April 2009): 537–8, https://doi.org/10.1016/j.aos.2008.04.003.
[93] Grubb, 'The Economics of the Kyoto Protocol', 153-4.

Figure 3: The quad-variate international-level policymaking framework.



9. Conclusion

The 'skeleton' of the Kyoto emissions market laid the foundations for further 'demonstration effects'. Subsequent markets have yielded new insights, so that investigations into international 'markets for pollution' are ongoing. The travels of the 'market for pollution' in the pre-Kyoto period, where early policy implementations were centred mainly in the US, were critical for these developments. These pre-Kyoto implementations were the result of the following.

The idea had 'character': it was flexible, manipulable, and congruous with policy paradigms and mainstream economic thought. It was therefore amenable to being processed by producers, brokers, and users of economic knowledge. The former two groups were expanding and becoming better equipped as 'companions' for the idea's travels, given that environmental economics itself was increasingly institutionalised and developed. The latter two groups demanded the idea more as a result of economic literacy improvements and the 'demonstration effect'. Concomitantly, some knowledge resisters played an unintentionally pro-travel role. These interactions were further assisted by an expansion of environmental awareness and the neo-liberal consensus. Once implemented, the idea had performative impacts and generated even better conditions for its own travels as part of the 'demonstration effect'. It was, therefore, in a strong enough position

within the US policymaking realm to enable its promotion by the most powerful delegation at the Kyoto negotiations. The increasingly climate-aware world was ready for a paradigm change. However, being the first economic instrument to be implemented on an *international* level, the policy needed to be supplemented by mechanisms that would generate cooperation and commitment.

The application of ideas-performativity concepts to an amalgamated narrative from various strands of the HEEE literature has revealed the above. Yet this dissertation has also produced insights into how ideas travel and are implemented as policy. The analysis introduced knowledge resisters, who were found to have some *pro*-travel effects. Additionally, the 'demonstration effect' reveals the importance of a policy's performative effects on the subsequent travels of an idea. It will operate more strongly for 'flexible' ideas that can be implemented in a variety of contexts. In international policymaking, the geographical centre of an idea's travels becomes important; if that centre is authoritative – as the US was at Kyoto – then the idea itself is more likely to achieve implementation. However, a fourth policymaking variable is required at this level: a mechanism or instrument characteristic must be included to generate cooperation and credible commitment to the resultant policy.

This dissertation is only a preliminary contribution towards reassessing the HEEE. Empirical research into the performative effects of the 'market for pollution' would generate a stronger case for the 'demonstration effect' described herein. Moreover, the HEEE literature rarely discusses the role of knowledge brokers; a more in-depth analysis of these actors and the identification of some examples thereof would be greatly beneficial. How to apply economic ideas to environmental policymaking is an ongoing and pertinent question. Conducting further research on the historical development of this phenomenon is critical to understanding how these ideas might evolve and instigate performative change in our present.

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