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William Nordhaus's Climate Club Proposal: thinking globally about climate change economics

Introduction

'Think globally, act locally' has long been a rallying cry for progressives and green activists. In this article I stress the importance of thinking globally *before* acting locally in the wake of the 2015 Paris conference on climate change.

Both the content of the Paris Agreement and the political rhetoric surrounding it feel like a return to 1992 following the signing of the Rio Declaration and the United Nations Framework Convention on Climate Change. Then, as now, the air was filled with high aspirations, and declarations of political commitment, and promises of future action; but now, as then, the real work of translating aspirations into effective action remains to be done. From Rio to Kyoto took five years; the road to general acceptance that the Kyoto Protocol had failed took another 15 years. Having thus come full circle on climate change policy, it is important to reflect on mistakes that were made first time around, and to draw lessons for practical policy in the coming decade.

Among the policy mistakes made after Rio, two stand out. One was to underestimate the importance of free-riding. The second was to adopt too narrow a set of options for the policy agenda.

The Paris Agreement tries to limit free-riding by having all countries as parties, while leaving actual policy design to countries operating under a 'pledge and review' arrangement. The pledge-and-review procedure leaves untouched the incentives for free-riding that sank the Kyoto Protocol, while, on the question of the agenda for effective actual action, the Paris Agreement leaves a substantial policy vacuum. New Zealand, like most other countries, can continue to wait to see what everyone else does, while emphasising the broadly correct and persuasive point that we are too small to save the planet on our own. After watching this process of free-riding play out over the past two decades, and after watching calls for global good citizenship fall on deaf ears – especially the bit of the story where rich nations are asked to agree to large-scale wealth transfers in favour of poorer nations – it is time to go back to first principles.

At the outset it has to be emphasised that in the absence of a legitimate, hegemonic world government to legislate

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and enforce policy, many of the textbook solutions for market failure have to be rethought. As Barrett points out,

> The approach [to global climate policy] taken thus far has been to set economy-wide targets and timetables. This approach would be ideal were it possible to regulate the world's greenhouse gas emissions in top-down fashion. Unfortunately, however, the world's governance arrangements have to work from the bottom up. The world does not have one government; it has nearly 200. An agreement to reduce emissions must not only be attractive from the perspective of the global good. It must also be something to which countries individually want to accede and to adhere. (Barrett, 2009, p.2)

In policy debates over climate change to date the idea of *directly* pricing in the externality has generally been framed in terms of a carbon tax imposed by some legitimate central authority.

The issue

Climate change is a problem requiring collective action in an age when the prevailing ideological climate is strongly individualist and anti-collectivist. But while ideology is not helping, the real stumbling block to reaching an effective global policy regime to cut back carbon emissions is economic. We are up against the 'tragedy of the commons' – the difficulty of securing the supply of a public good when the individual incentive for all players is to free-ride on the efforts of others. As Gollier and Tirole summarise the situation:

> Most benefits of mitigation are *global* and *distant*, while costs are local and immediate. Climate change is a global commons problem. In the long run, most countries will benefit from a massive reduction in global emissions of GHGs, but individual incentives to do so are negligible. Most of the benefits of a country's efforts to reduce emissions go to the other countries. In a nutshell, a country bears 100% of the cost of a green policy and receives, say, 1% of the benefits of the policy, if the country has 1% of the population and has an average exposure to climate-related damages. Besides, most of these benefits, however small, do not accrue to current voters, but to future generations. Consequently, countries do not internalize the benefits of their mitigation strategies, emissions are high, and climate changes dramatically. (Gollier and Tirole, 2015, p.6)

Free-riding – the basis of the 'tragedy of the commons' – is a staple topic in the elementary economics textbooks, and the textbooks quickly offer three standard solutions. Either individual incentives have to be brought into line with the common good by pricing in all relevant externalities, or a legitimate collective or central authority with a clear mandate and adequate enforcement powers must intervene to block or restrict any market-driven activities that threaten the common good, or some combination of the two.

How cap-and-trade came to dominate the options

Economists instinctively favour pricing as an essential component of any policy response because if prices are wrong, then individuals have the incentive to subvert or evade any command-and-control regulations that may be imposed, triggering the need for costly and probably ineffective enforcement measures.[1] In policy debates over climate change to date the idea of *directly* pricing in the externality has generally been framed in terms of a carbon tax imposed by some legitimate central authority. The command-and-control alternative has been framed as each country being allocated a quota limit on its emissions and required, on pain of enforceable direct sanctions, to limit its domestic emissions. The third theoretical option – a combination of the two – has been cap-and-trade, under which a command-and-control global emissions cap is allocated via a market process that is designed to seek out the most cost-effective mitigation options.

A standard argument, advanced by a lot of economists at the beginning of the big climate change policy debates of the late 1980s and early 1990s, ran in three steps:[2]

- A global carbon tax was ruled out by the absence of any legitimate global taxing authority and by the perceived moral hazard problems of having a single agency handling the vast revenues involved.
- Pure command-and-control is notoriously inefficient when compared to an arrangement that focuses all effort on securing the lowest-cost means of cutting emissions, so some way of bringing market incentives to bear was needed.
- Cap-and-trade looked like a way to do this, provided that a couple of obvious problems could be solved:
  - a strictly limited quantity of tradable permits would have to be allocated on an acceptable basis to a set of initial recipients;
  - the new global permits market would have to meet some basic requirements of competitiveness and liquidity.

Briskly abstracting from the complexity of the real world, Bertram (1992) proposed that emission permits be allocated on a per capita basis across the world's population, with each permit denominated as one individual's share of the global annual carbon cap. As the cap tightened over time the scarcity value of permits would rise, but

as technological progress reduced the carbon intensity of economic activity their scarcity value would fall. A well-functioning permit market would reflect these two opposing forces, and the resulting price signals would guide resources into the most cost-effective allocation consistent with sustainability of the global environment.

Seduced by the deceptive elegance and simplicity of this scheme, I was confident that the one obvious problem could be overcome: the rich countries would have to accept that giving every global inhabitant an equal right to the atmospheric commons would mean that when the permit market opened, the rich would have to buy a big chunk of transferable quota from the poor. The resulting annual wealth transfer with a $20 per ton carbon price would, I calculated, have been about $50 billion in 1992 US dollars, slightly greater than the total flow of international development aid at that time, but only a fraction of, for example, global arms expenditure. A carbon price of $40 per ton would transfer US$100 billion per year. This seemed, I argued, a manageable cost to save the planet, and I appealed to the self-interest of the rich as the reason for them to accept the cost voluntarily as the cheapest way to save the earth's climate.

There were two legs to my argument that now look, respectively, wildly over-optimistic and sadly prescient. The wildly over-optimistic:

> The large industrial countries would have to shoulder an adjustment burden proportional to the scale of their existing polluting activity, since the scheme would oblige the polluters to pay the rest of the world community for their right to pollute. The leading polluters would naturally be reluctant … However, the peoples of the rich countries have a large stake in protecting the global environment, which might well outweigh political pressures from powerful industry lobby groups.
> …
> The world community faces an historic chance actually to achieve the development goals to which so much lip service is paid on the diplomatic circuit, as a by-product of that community's willingness jointly to confront the greenhouse issue. The developing countries deserve no less than full partnership in this process. If full partnership is denied them, they have the ability credibly to threaten ecological disaster. Prudence, as well as benevolence, should prompt the rich to tolerate economic redistribution on a very considerable scale. (Bertram, 1992, pp.435, 440)

The prescient:

> If the opportunity is lost to tackle development and sustainability as simultaneous parts of a joint problem, then the global outlook darkens seriously. Either the greenhouse effect could be held at bay by condemning the poor countries to long-term underdevelopment; *or the South might grow for a generation or two without regard to the environmental consequences, exposing the entire global community to the risk of catastrophic climate change.* (Bertram, 1992, p.440, emphasis added)

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The rest is history. At Kyoto in 1997 the rich countries set up a limited emissions trading regime among themselves, but with no global cap. In place of an authoritative and binding global cap, country-by-country targets for Annex I countries were negotiated, that never came close to consistency with a serious global carbon budget. No credible enforcement machinery emerged. Meanwhile, the global south, including China and India, was left to roll on with business-as-usual emissions-intensive growth.

Two key mistakes

What, with the benefit of hindsight, can one say about the reasoning that led many economists in the 1990s and 2000s to advocate global cap-and-trade? Two mistakes stand out. The first was over-optimism about the possibility of establishing a binding global quantity cap on emissions in the absence of a global government. Once cap-and-trade negotiations moved from a single global cap and free allocation of permits per capita across the entire global population, to the Kyoto arrangement of letting countries negotiate their own pre-specified quantitative targets, the essential institutional architecture of my 1992 plan was dead, and with it the hope of confronting the whole global community with a uniform common incentive to abate. Thereafter, climate change negotiations became bogged down in a free-riding morass as each country tried to minimise its own target and hence its compliance costs.

The second common mistake was to work from an incomplete listing of the options for organising a global policy regime, overlooking the option that has now abruptly leapt to the forefront in the current economics literature: a negotiated global carbon price floor secured *without imposing a global carbon tax*.

The new policy frontier: a negotiated and enforceable global price floor

Bertram (1992, pp.431-36) canvassed four options, which were presented as an exhaustive list:

1. *Direct regulation:* transparent and certain, but
   - administratively costly;
   - hard to harmonise across many countries/jurisdictions;
   - hard to enforce effectively (in the absence of a world government) or fairly (given the existing imbalance of power between large and small countries).

2. *Carbon tax:* the textbook answer, but
   - the tax would have to be specified in some currency, after which exchange rates could present a problem and could be subject to manipulation;
   - no global authority exists with the mandate to impose the tax; and
   - the revenues collected would be on a huge scale even if there were a taxing authority, which would present a moral hazard problem.
3. *Private litigation:* the initiative would lie with individuals, agencies and companies around the world to sue polluters through the courts of each country, but
   - wealthy polluters could stall litigation indefinitely;
   - it is unclear what sanctions the courts could impose; and
   - there would be a loss of sovereignty as each country faced having its courts invaded by non-residents.
4. *Tradeable permits:* judged best if done as laid out in the paper, even though
   - the big wealthy polluting countries would have to swallow large wealth transfers to poor low-emission countries; and
   - the likely attempt by large vested interests to capture the scheme by seeking grandfathered permits would have to be defeated.

Looking down that list it is obvious with hindsight that (at least) one option was missing. Because the price option was framed as a tax, rather than simply as a price, the problems of implementing a global carbon tax were allowed to sink the price option without further consideration. Cap-and-trade was the fallback means of getting a global price in place, but it suffered precisely the same fatal flaw as the carbon tax: there was (and is) no global authority with the mandate and the means to enforce a global policy from the top down.[3]

Once, however, thinking shifts from a top-down to a bottom-up way of addressing the global problem, it is possible to think of a global (or at least widely applied) price for carbon that is not secured by means of a global carbon tax. All that is required is that a global price floor be agreed and enforced by some coalition or 'club' of nations. This is the option that now commands growing attention and support among economists. It was the subject of the lead article, by William Nordhaus, in the *American Economic Review* for April 2015, and was the central theme of a heavyweight symposium in the September 2015 issue of *Economics of Energy and Environmental Policy*, with papers by Weitzman (2015), Stiglitz (2015), Gollier and Tirole (2015) and Cramton, Ockenfels and Stoft (2015).

The single price commitment eliminates the need to negotiate a set of country-by-country quantitative emission targets.

The proposal runs as follows:

- All countries that sign up (thereby forming a coalition or 'climate club') agree on a price that is to apply to carbon emitted within their borders. Ideally the club would be the entire global community, but smaller coalitions can implement the scheme, and there can even be several different coalitions, each with its own price.
- Each government within the club adopts policy measures to bring their internal carbon price up to that international price. They may do this by means of a domestic carbon tax, or a tradeable emission permits scheme with a floor price set at the agreed international price, or any other measure they may dream up. All revenues from a domestic tax or other scheme would remain with the national government in the first instance ('subsidiarity') and would be spent or distributed as that government chooses.
- All countries within the club impose a uniform tariff at their borders on imports from the rest of the world, both to incentivise others to join the club and as a means of restricting carbon leakage.

Of the three components of this scheme, only one single thing has to be collectively negotiated and agreed: the carbon price. The single price commitment eliminates the need to negotiate a set of country-by-country quantitative emission targets. The big advantage of going down this route is 'dimensionality'. If the world's governments are asked to agree on (or accept a collective decision on) just one single number – the price of carbon emissions – they have only that one thing to talk about and the success or failure of the negotiations would boil down to the emergence or non-emergence of just one agreed number. (Under the Paris Agreement's pledge-and-review replacement for Kyoto, the negotiation has to produce something like 200 individual country quantitative targets, for emission magnitudes the measurement of which is itself open to negotiation.) As Weitzman summarises it,

> A meaningful comprehensive quantity-based treaty involves specifying as many different binding emissions quotas … as there are national entities. Each national entity has a self-interested incentive to negotiate for itself a high cap on carbon emissions – much higher than would be socially optimal. The resulting free-rider problem plagues a quantity-based approach …
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> … low dimensionality argues in favour of a one-dimensional harmonized carbon price over an n-dimensional harmonized cap-and-trade system among n nations … Put directly, it is easier to negotiate one price than n quantities – especially when the one price can be interpreted as 'fair' in terms of equality of marginal effort'. (Weitzman, 2015, pp.38, 40)

The detailed policies to make that price applicable are left to participating governments, as are any revenues generated. This principle of subsidiarity means that the issue of international redistribution of income and wealth is dropped from the negotiating agenda, so that absolute priority can be given to the single goal of establishing a global carbon price. (I used to think that the two goals – a carbon price and global equity – could be achieved jointly, but I now concede that the myopic self-interest of the rich is an immovable roadblock, and that we simply have to work around it.)

The two greatest strengths of this approach are: (1) the creation of a uniform and universal incentive across many countries to reduce emissions wherever it is cost-effective to do so under the prevailing carbon price; and (2) an enforcement mechanism (border tariffs) that operates impersonally through the market rather than requiring legal prosecution, specific targeted sanctions or a threat of military intervention, and which provides an incentive for non-participant countries to join the club.

Nobody thinks this approach would be simple in practice. All the economists writing along these lines agree that it faces enormous obstacles and objections, though probably less serious than those confronting the alternatives, and with far greater chance of solving the climate change problem than those more 'politically feasible' alternatives.

Thinking globally, acting locally

What does this imply for national policy? Start with the clear recognition that the central problem is free-riding, which means conceding that the current New Zealand government stance can be defended as economically rational given the current global policy regime. For a 'typical' or 'representative' individual around the world there are likely to be more penalties than rewards from living in a country that acts unilaterally to cut its carbon emissions in a world where others free-ride. The benefits of unilateral action are intangible (mainly moral satisfaction); tangible gains are negligible for a small country that acts alone, since there will be no climate change mitigation benefits to one's grandchildren so long as free-riding by others continues. In stark contrast, whatever costs may result from living in a *world* that collectively puts a price on carbon, those costs pale into insignificance beside the tangible benefits from effective mitigation. It is, in short, entirely 'rational' for voters to support global action but oppose unilateral national action.

Individual citizens may have agency within their nation, but they have none at global level. To get the desired global result one still has to act through one's national government, so what is needed is a policy that can be adopted by individual nations without plunging them into unproductive economic pain, and which can then evolve into a collective global policy that provides a consistent worldwide incentive to cut back carbon emissions. We are searching here for what economists call incentive compatibility. We are looking for a national strategy that does not require premature and costly unilateral action, but that has a serious chance of providing a focal point around which international negotiations may be organised. Hence the appeal of the climate club idea.

The form of each potential club member's upfront price commitment is 'I will if you will': in other words, a single country does not bind its citizens to anything unless and until a coalition of some minimal credible size emerges. But once the coalition reaches critical mass the international agreed price would come into being. All that has to be done by the lead country or countries is to call for formation of that coalition, invite others to join, and perhaps propose an actual price as the starting point for negotiations. Painless leadership has some appeal, surely?

The second element of the strategy, provided that a viable (critical-mass) club forms, would be translating the agreed-upon price into domestic terms. New Zealand would be able to do this under the existing emissions trading scheme by putting a floor price under the market for New Zealand units (NZUs), and by blocking or taxing the import of carbon credits from any country that has not joined the club and imposed a corresponding floor price or carbon tax. Or we could move to a carbon tax as the Greens have proposed.

The third element – the crucial part of making any club stable – is excludability: imposing a meaningful cost or penalty on those who do not join the club, which provides the incentive for them to join. Central to the climate club proposal is border adjustment. Members of the club would impose a harmonised tariff to apply on all goods imported from non-participating countries. Non-membership would then mean confronting the carbon tariff whenever trading with countries in the club. The tariff would both restrict carbon leakage and provide the incentive for new members to join up.

> A carbon-pricing club would have an inclusionary rather than an exclusionary aim, and would be pursuing the global good rather than just the self-interest of members.

Tariff design

There are two options for this tariff design: a tariff based on the carbon content of imported goods, or a simple penalty tariff on all imports from non-members. Stiglitz and Helm have argued for the first of these, mainly as a targeted weapon against carbon leakage, but partly also on the basis that solid precedents would make it WTO-legal. Nordhaus argues for the second – a uniform penalty tax on non-participants – on the basis that (1) it is simple compared with the complexity of a carbon tariff; (2) the

relevant damages to be countervailed are not so much carbon leakage as climate change in general, which non-participants are failing to address via the pricing route; and (3) the central purpose is to incentivise club membership (Nordhaus, 2015, pp.1348-50).

Are such 'border carbon adjustments' (tariffs) novel, or incompatible with WTO rules, or unthinkable? Consider the Trans-Pacific Partnership Agreement (TPPA), under which a group of countries led by the United States is to form an exclusive club with various market barriers to be overcome by non-members wishing to trade with the club. Whereas the TPPA is, I would argue, a negative example of club formation, with exclusion of China and ascendancy of the US as one of its core purposes, it is certainly not incompatible with existing trade law. A carbon-pricing club would have an inclusionary rather than an exclusionary aim, and would be pursuing the global good rather than just the self-interest of members. But it would use the same essential defensive tool of a common external tariff or other barrier against non-members to ensure there is a benefit of membership and a cost of defection from the club.

Nordhaus, however, accepts that his proposal for a straightforward penalty tariff on non-participants could run counter to international law as it currently stands, and he bluntly proposes that:

> an important aspect of the proposal will be a set of 'climate amendments' to international-trade law, both internationally and domestically. The climate amendments would explicitly allow uniform tariffs on nonparticipants within the confines of a climate treaty; it would also prohibit retaliation against countries who invoke the mechanism. (ibid., p.1349)

It is probably true that whatever option was chosen for the common tariff, someone would challenge it under the GATT/WTO rules, and this challenge would have to be successfully fought, either under the GATT's chapter XX exclusions or by securing a change to international law. If a challenge succeeded and/or the law could not be changed, then in the worst case the carbon club would disband and individual nations would fall back to the default option of business-as-usual trade. If the challenge failed, the club would immediately gain momentum and members. My expectation and hope is that any challenge would fail, but it is obvious that defeating a challenge would be more likely the greater the number and weight of nations joining up to the carbon club at the start. In short, the downside of stepping up to the club-forming carbon-pricing proposal is the possibility of no change from the status quo, and the upside is the chance of a serious and coordinated assault on global warming, using a mechanism that short-circuits the free-riding problem.

The bottom line is that the Paris Agreement has not solved the basic free-rider problem in climate change policy.

Conclusion

The bottom line is that the Paris Agreement has not solved the basic free-rider problem in climate change policy. The quantity-based pledge-and-review approach is too complex, too weak and too vulnerable to manipulation. A price-based market mechanism has the potential to reduce complexity and manipulation, while removing much of the free-riding incentive, so long as it embodies strong penalties for defection. Two of the leading figures in the economic debate summarise these points as follows. First, Weitzman:

> With the failure of a Kyoto-style quantity-based approach, the world has seemingly given up on a comprehensive global design, settling instead for sporadic national, sub-national, and regional measures. These partial measures seem far from constituting a socially efficient response to the global warming externality. Perhaps … the Kyoto-style quantity-based focus on negotiating emissions caps embodies a bad design flaw. The arguments of this paper indicate a way in which negotiating a binding internationally-harmonized nationally-collected minimum price on carbon emissions might help to internalize the global warming externality. (Weitzman, 2015 p.49)

Second, the ever-cautious Nordhaus:

> Here is the bottom line: … without sanctions there is no stable climate coalition other than the noncooperative, low-abatement coalition. This conclusion is soundly based on public-goods theory, on C-DICE model simulations, on the history of international agreements, and on the experience of the Kyoto Protocol. …
>
> … an international climate treaty that combines target carbon pricing and trade sanctions can induce substantial abatement. … The attractiveness of a Climate Club must be judged relative to the current approaches, where international climate treaties are essentially voluntary and have little prospect of slowing climate change. (Nordhaus, 2015, p.1368)

1 There is a strong stream of research led by Elinor Ostrom that emphasises the power of voluntary collective action through non-price measures to solve tragedies of the commons problems, but this works well only at local level: for example, protecting local water aquifers from depletion, or allocating scarce irrigation water from a shared canal system, or managing a clearly bounded fishery. A successful pledge and review process following the Paris Agreement would vindicate Ostrom's position at a global scale, but would require a truly seismic shift in world politics. See Ostrom (1990) and Potete, Janssen and Ostrom (2010). I have discussed Ostrom's ideas in more detail in Bertram, 2013, pp.10-13.

2 For a straightforward statement of this case see Bertram (1992), based largely on an earlier paper that I and two colleagues wrote in 1989 for the Ministry for the Environment (Bertram, Stephens and Wallace, 1990).

3 There does exist a mechanism in the United Nations Charter whereby the UN Security Council could become such an authority, by declaring climate change a danger to 'international peace and security' and taking action against free-riding nations.

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