TRANSNATIONAL CLIMATE INITIATIVES: AN ALTERNATIVE WAY TO CLIMATE CHANGE MITIGATION?

Katharina Michaelowa* and Axel Michaelowa
katja.michaelowa@pw.uzh.ch, axel.michaelowa@pw.uzh.ch

Address (for both authors):

Center for Comparative and International Studies (CIS), University of Zurich
Affolternstr. 56 (office # 321)
CH-8050 Zurich
Switzerland

* corresponding author

Abstract: Given the deadlock of negotiations within the UNFCCC, can transnational climate governance initiatives be expected to fill the gap? We assess 109 such initiatives based on four criteria of their contribution to greenhouse gas mitigation: existence of mitigation targets, incentives for mitigation, definition of a baseline, and existence of a monitoring, reporting and verification procedure. About half of the initiatives do not fulfill any such quality criterion and only 10% satisfy three or more. On average, quality of newly set up initiatives was highest during the "heyday" of the international climate policy regime between 2005 and 2010. Government orchestration and the existence of national emission targets show a positive correlation with quality. While effective entrepreneurial initiatives are generally started only as a complement to existing regulation, sub-national governments and NGOs show some attempts to go beyond that and compensate for the lack of dynamics at the UNFCCC. Yet, given the low overall quality assessment, transnational climate governance initiatives cannot be expected to fill the "mitigation gap". Vulnerable developing countries that should have the strongest preferences for such mitigation action do not seem to be more successful within transnational initiatives than within the international system as a whole.

Keywords: International climate policy, transnational governance, effectiveness, mitigation

TRANSNATIONAL CLIMATE INITIATIVES: AN ALTERNATIVE WAY TO CLIMATE CHANGE MITIGATION?

1. Introduction

Subsequent to the failure of the Copenhagen Conference in 2009, practitioners and scholars have been eager to find alternatives to the UNFCCC process. Non-UNFCCC initiatives – i.e. action of country groups, institutions or other stakeholders from the public or private sector or civil society that is not framed as part of the UNFCCC regime or that targets anthropogenic drivers of climate change so far not addressed under the UNFCCC – could contribute to closing the ambition gap, be more versatile than UNFCCC-related action and provide strategic benefits for nations that choose to scale up climate finance outside of the UNFCCC. Diverse transnational climate governance (TCG) initiatives by NGOs, private sector associations and firms, as well as subnational entities have been identified as a potentially promising development in this respect. While in 2011, the Conference of the Parties to the Kyoto Protocol (COP) in Durban agreed to achieve, at the latest by 2015, a global climate agreement covering all Parties that should come into effect by 2020, it remains uncertain whether this agreement can be effectively reached in 2015. If progress at the UNFCCC negotiations remains elusive, the political relevance of alternatives to the UNFCCC process will increase massively. Moreover, they may mobilize mitigation action in countries that do not take up commitments under such an agreement and/or that generally lack domestic mitigation policies or targets. In the run-up to the decisive COP hosted by France in 2015, French President François Hollande consequently underscored the important role of TCGs (Hollande 2015:85).

For TCG initiatives to offer a credible alternative pathway to climate change mitigation, two conditions must be satisfied: First, the expected quality of these initiatives must be sufficiently high, and second, they should not depend on the existence of effective international and/or national regulation in the first place. The second point is crucial to understand whether they can truly be alternative approaches replacing the UNFCCC, or whether they only represent complementary avenues to reach the common goal of preventing dangerous anthropogenic climate change. The first point poses the basic question about their potential to mitigate global climate change. It is hence important to understand not only the conditions under which such initiatives arise (covered by other papers in this volume), but also whether (and under which conditions) TCG initiatives can effectively harness mitigation or whether they simply resell business-as-usual scenarios under a green label.

The literature so far concludes that it is unclear whether TCG initiatives have been effective in reducing emissions (Stavins et al. 2014). Pinkse and Kolk (2009) stress the complexity of measuring outcomes while Pfeifer and Sullivan (2008) see government regulation as crucial to send signals to investors that are then reflected in a TCG initiative. A similar point regarding UNFCCC regulation is made by Green (2013:2) who describes the Kyoto Protocol as a “coral reef” that attracts a number of interesting complementary initiatives. Some authors also suggest that TCG initiatives may in turn influence government regulation, e.g. private carbon market standards that lead to an improvement in mandatory

carbon market regulation (Hoffmann 2011). Similar arguments about complementarities are made in the general literature on TCG initiatives (Potoski and Prakash 2005; Berliner and Prakash 2014) and by some of the papers in this issue. Some authors also examine the conditions under which such voluntary programs can be successful (Baranzini and Thalmann 2004; Morgenstern and Pizer 2007; DeLeon and Rivera 2009; Darnall and Kim 2012; Berliner and Prakash 2015).

In this paper, we build on this literature to examine to what extent the hopes that TCG initiatives could compensate for a dysfunctional UNFCCC system may be justified. Section 2 discusses theoretical arguments based on a rational-choice approach by the actors involved. We thereby examine under which conditions such initiatives can be expected to contribute to climate change mitigation and whether they could substitute for or only complement domestic and/or international regulation. Section 3 provides a discussion of our approach to measure the quality of the initiatives, and Section 4 combines illustrative evidence, descriptive statistics and multivariate econometric analysis to assess the plausibility of our hypotheses. The empirical analysis is based on the Roger, Hale and Andonova (2015) dataset of individual TCG initiatives complemented and updated by the authors. Overall, we consider 109 initiatives, which should correspond to the full set of TCG initiatives started between 1990 and mid-2015. Section 5 concludes.

2. Theoretical considerations

The effectiveness of a TCG initiative reflects the disposition of its members to actively engage in combating climate change. However, why should a rational actor want to take any serious steps towards climate change mitigation beyond what is required by national or international regulation in the first place? True mitigation is usually costly, and even the mere participation in transnational networks is (see Dolšak and Prakash, this volume). Why would anyone take up these costs?

The literature on voluntary programs identifies several mechanisms that may create such incentives. Looking at private firms, Berliner and Prakash (2014, 2015) suggest that demand for products by firms participating in voluntary initiatives (e.g., complying with stricter environmental standards) may be greater and the price they can charge may be correspondingly higher. More generally, they can benefit from reputational benefits (Potoski and Prakash 2005, 2013; see also Green, this volume). In this case the environmental engagement can be directly translated into market value. However, to ensure that reputational effects cannot be reaped from simple window dressing, considerable transparency is required on the market. Firms tend to select the cheapest way to (just) meet the recognized standard (Berliner and Prakash 2015). In climate change mitigation, the required transparency is not easy to achieve and may depend on national and, notably, international regulation.

Moreover, membership in a TCG initiative may signal compliance to the national authorities (e.g., through ISO certification) who then redirect their verification of compliance with the lower domestic standards towards other firms. In this case, the firms can save on transaction cost involved in the verification process. The latter obviously depends on the existence of some domestic regulation in the first place and on the seriousness of the national verification process, i.e., the absence of corruption (Berliner and Prakash 2014).

A similar mechanism is conceivable with respect to international regulation. For instance, to facilitate the acceptance of a project in the framework of the Kyoto Protocol's Clean Development Mechanism (CDM) that grants the certification of emission reductions that can be sold on the market, it may be helpful to adhere to the stricter rules of the private "Gold Standard" initiative in the first place.

Finally, firms' voluntary engagement may be based on the expectation to achieve domestic or international requirements in a more cost-efficient manner. At times, this can be achieved by exploring a first mover advantage, e.g. by investing in carbon funds early on to benefit of low hanging fruits, i.e., cheap interventions that still lead to considerable emission reduction. In these cases, participation in voluntary initiatives may make sense as soon as the regulation is expected, even if it is not yet agreed upon.

Overall, the discussion suggests that serious voluntary programs can be attractive for private firms under the condition of complementary domestic and/or international regulation, or a direct valuation of corresponding efforts by the market. However, when these conditions are absent, firms should not be expected to engage in costly mitigation activities. This implies that their activities will at best be complementary and cannot compensate for a lack of domestic and/or international regulation. We will test this hypothesis in the empirical section below.

Let us now move on to the discussion of other participants in TCG initiatives. Regarding sub-national entities such as regions or cities, we assume that the profit maximizing perspective we adopted for firms can be replaced by a utility maximizing perspectives based on public support, or, more specifically, electoral support (if applicable). People in specific localities may have a direct interest in climate change mitigation that is not met by regulation at the international or domestic level. In fact, in many countries in which the populations are most vulnerable to climate change, domestic regulation has no potential to solve the problem, because of poverty and lack of industrialization – so that there are hardly any local emissions that could be reduced. Transnational cooperation of sub-national entities such as cities and regional governments may then provide an alternative avenue to push the agenda. The effectiveness of transnational cooperation created on this basis will, of course, depend on the willingness of strong polluters to also participate in such initiatives and to increase their mitigation efforts. If strong polluters are not willing to make such serious efforts and this can be anticipated by developing countries, it does not make much sense for the latter to promote such initiatives either.

The key question therefore is whether people in highly polluting regions – possibly without much direct benefit from climate change mitigation – may support local or regional governments engaging in TCG initiatives. This could happen because they generally value the protection of the environment and/or care for people more directly concerned in other world regions or in later generations. This can lead to special efforts by some sub-national governments to go beyond required regulation or to even try to compensate for national and international policies that are considered to be insufficient.

Assuming that national governments care for the total of the different regional constituencies it is difficult to conceive, however, that serious engagement in a majority of sub-national entities would not be matched by a similar engagement of the national government. Indeed, the literature tends to find a positive correlation between national environmental policies, national regulation, and the engagement of sub-national entities (Andonova, Hale and Roger 2014; Lee, this volume). By highlighting the role of domestic NGOs on the engagement of cities Dolšak and Prakash (this volume) also point at the link between national and sub-national policy support. Moreover, arguing that domestic regulation may untighten the sub-national units' budget constraints, Cao and Ward (this volume) provide an alternative theoretical rationale for a complementary rather than compensating engagement of cities and regions on the one hand, and national governments on the other hand. However, this only applies for specific policies that provide a direct financial reward for mitigation action.

In sum, as opposed to private firms, theoretical arguments can be made for both compensating (substitutive) and complementary activities of sub-national entities. The empirical analysis will have to show which of these dominate in practice. It should be noted, however, that even though some compensation for reduced activities at higher levels of

governance may be plausible, the arguments advanced here do not lead to the expectation that this compensation may be complete. More specifically, from a theoretical perspective, if national governments cannot agree on appropriate commitments to reach the 2°C target at the level of the UNFCCC, the chances to make up for this through alternative transnational initiatives are rather minimal, even if some partial compensation for the international deadlock is possible. This is because national governments consider the totality of regional (and local) constituencies and if there was sufficient overall support for such policies, national governments would also be able to advance the necessary commitments at the level of the UNFCCC.

A third group of relevant actors are NGOs. It is usually assumed that they are intrinsically motivated to engage for the mitigation of climate change driven by environmental and distributional norms. As people self-select into different groups of actors, it is indeed plausible that members of NGOs have particularly strong preferences in this respect. This should induce them to promote both, transnational activities complementary to existing regulatory policies, and alternative initiatives compensating for the lack of other regulation.

However, NGOs work under budget constraints, just like any other actors considered here. Their budget is usually composed of private donations and public subsidies. This is why their activities also depend on the valuation of the general public and different levels of government. If a topic runs out of fashion, NGO resources in this area may dry up. This is why the compensating potential of NGO activities must be considered as rather limited.

Finally, let us consider the potential of international organizations and of national governments to initiate and shape effective TCG initiatives. This role has been examined in detail by Hale and Roger (2014). Since some international organizations such as the World Bank have already gained considerable experience in the field, they could use their influence to improve the quality of TCG initiatives. As the UNFCCC loses importance, we might expect other organizations to use the opportunity to broaden their fields of activity. In addition, both international organizations and governments whose climate-friendly preferences are not matched by the current developments at the level of the UNFCCC might try to mobilize and shape alternative bottom-up initiatives. This should create a tendency of increased initiating and shaping activities in recent years, possibly also with an effect on the quality of these initiatives. Involvement of international organizations in initiating and/or shaping TCG initiatives may also help these initiatives to reach a certain level of coordination that may be important by itself: In a lose network of decentralized actors binding commitments, effective verification procedures or the like are quite difficult to imagine.

3. Measuring the (expected) quality of TCG initiatives

Among the many studies quoted above, most simply look at the emergence of new initiatives. An analysis of their actual effectiveness is rare. This may lead to an overly optimistic picture, notably when public support for city or regional governments or market valuation by consumers is not based on sufficiently profound information. In this case, participation in any kind of initiatives with a green label may be sufficient to convince the relevant audience, even if this label has no real value.

However, measuring quality and thereby distinguishing effective from ineffective (or less effective) initiatives is a difficult task (Pinkse and Kolk 2009; Chan and Pauw 2014). First, it is rarely possible to directly observe effects of transnational initiatives or voluntary programs more generally. Exceptions are possible only when examining a single program on the basis of very detailed information of its individual members. A convincing example is the analysis of the Global Compact by Berliner and Prakash (2015). Assessing the impact of a program further requires the specification of a plausible counterfactual. For instance, while we might be able to measure that emission reduction projects under the

"Gold Standard" are indeed more convincing than projects that do not fulfill this standard, how do we know that these convincing projects would not have been better than other projects even without the existence of the standard? This identification problem plagues the literature of the effectiveness of international regimes more generally (see Tetlock and Belkin 1996:3, Young 1999, and Helm and Sprinz 2000:633ff.).

Given the broad range of initiatives we look at, and the intention to make them comparable with the view to a single objective, namely climate change mitigation, we need to content ourselves with measures at the process or output level. This is much less ambitious than to assess outcomes or even impact, and it may entail the risk to overestimate success (Young 2011). From a results chain perspective, effectiveness at the output level is a necessary, but not a sufficient condition for effectiveness at the outcome or impact level. What we will assess here can hence be considered as the minimum requirements for possible effectiveness. Admittedly, this approach also ignores unexpected or unintentional effects. However, it is impossible for us to tackle the complex issue of effectiveness for the comprehensive set of TCG initiatives in any more detail, and we believe that this rough approach is sufficient for an initial discussion of the matter.

As the objective of this article is to analyze whether TCG initiatives have the potential to compensate for the standstill of activities at the level of the UNFCCC, we formulate some necessary conditions for any initiative to plausibly contribute to the UNFCCC's major goal. We consider that this major goal is the convergence of emission paths towards a level consistent with the 2°C target agreed upon at COP 15 in Copenhagen 2009 and reiterated at multiple international conferences thereafter. Initiatives that merely focus on information exchange or on adaptation to, rather than mitigation of, climate change, cannot meet this criterion. While they may be very valuable in other respects, they cannot provide an alternative to the UNFCCC process, and they are not designed for this purpose in the first place. This illustrates that our approach deliberately ignores other effects of TCG initiatives, i.e. all effects that are not directly linked to the mitigation of global climate change.

To the best of our knowledge, no comprehensive classification of TCG initiatives with respect to their mitigation potential has been provided so far. UNEP (2015) has come closest to this objective and provides a clear and credible approach, but by limiting the assessment to the analysis of mitigation targets the final indicator can be calculated only for a small subset of 15 initiatives. Similarly, Hsu, Moffat, Weinfurter and Schwartz (2015) also focus on mitigation targets (announced either by the initiatives or by their members). While this focus on targets allows the authors to compute the potential volume of emission reductions, it ignores other pathways of climate change mitigation that are not directly quantified within the initiatives, e.g., through the use of financial incentives. Research initiatives to go beyond these initial classifications are under way, but not yet fully developed and applicable (Galvanizing the Groundswell of Climate Actions 2015; GDI and LSE 2015).

It appears to us that including other criteria beyond the definition of a mitigation target is essential to do justice to the different types of initiatives. As stated above, financial incentives may also contribute to effective emission reductions, at times even more than the definition of targets. The Pilot Auction Facility, for example, invites project developers to participate in auctions and thereby selects and funds the most efficient mitigation projects. In addition, monitoring, reporting and verification (MRV) devices can raise transparency and thereby create competition for best practice, at least as far as this is valued by the population. An example is the International Council of Local Environmental Initiatives (ICLEI), a cities network that supports inventories of its members' emissions so that they become comparable within and across countries. This may have some effect even without the definition of targets. Finally, the definition of a credible baseline is important to distinguish any kind of activities from business as usual.

Instead of focusing on the mitigation target alone, we hence consider four quality criteria that should be met for any initiative to plausibly contribute to additional mitigation action. These criteria are: the definition of a mitigation target, the introduction of financial incentives, the specification of a credible baseline, and the definition and use of MRV.

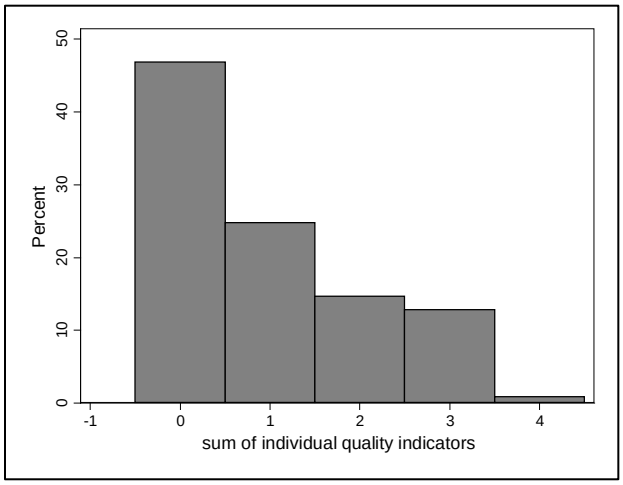
It should be noted that there is substantial complementarity between these criteria. In fact, a target without verification may not have any effect, no matter how ambitious the announcement. Similarly, financial incentives may not lead to the expected effects if there is no monitoring – moral hazard would undermine mitigation. And the most serious monitoring may not guarantee any improvement beyond business as usual if there is no credible baseline against which all developments can be assessed. For any truly convincing initiative we would hence expect all four criteria to be met simultaneously.

This is especially true if we consider that in order to constitute an alternative to the current international and national regulation the initiatives need to be self-contained. If we consider them as mere complements to already existing regulations they may contribute to the mitigation effort without fulfilling all of the individual criteria. For instance, the target may be provided through national commitments made within the framework of the Kyoto Protocol, so that there is no need for the individual initiatives to define such targets. However, even initiatives that are intended to complement rather than to substitute for domestic and international regulation are much more credible when several rather than just one of our criteria is fulfilled.

These considerations lead us to the definition of our quality indicators. Ideally, we would have started by an indicator variable for those initiatives that indeed meet all four criteria. However, as this is the case only for a single initiative we provide alternative indicators based on lower requirements. Quality3 is a dummy variable taking the value of 1 if three out of the four conditions are fulfilled, and Quality2 is a similar measure for at least two criteria being met. In addition, we consider all the individual criteria separately as well as a summary measure adding up all conditions that are fulfilled (Quality1).

Figure 1 presents the distribution of initiatives based on this summary measure. It shows that almost half of the initiatives do not meet any of the basic conditions we formulated above. These are primarily the initiatives focusing solely on networking. 25% of the initiatives meet only one of the four criteria, 15% meet two, and 13% meet three. Most of the 13% meeting three conditions are incentive-based initiatives as schemes distributing funding usually also require some baseline and some MRV. The share of initiatives fulfilling the individual conditions are: 46% for MRV (Q_MRV), 27% for the requirement of a baseline (Q_Baseline), 13% for the generation of incentives (Q_Incentives), and 11% for the definition of a mitigation target (Q_MitigationTarget) (see Appendix, Table A1).

Figure 1: Share of initiatives meeting 0 to 4 basic quality conditions



The total number of initiatives taken into account includes 65 initiatives from the Roger et al. (2015) dataset. From the original data, 10 observations have been dropped because they either constitute sub-initiatives of initiatives already taken into account, do not meet Hale and Roger's inclusion criteria for TGC initiatives (according to the latest information available on the respective websites), or do not provide any information at all so that not even their mere existence can be ascertained. At the same time, we update the dataset by including 44 additional initiatives, mostly for the period from 2010 onwards when the coverage of the original dataset ends. To select these initiatives, we follow the original codebook used by Roger et al. (2015) based on the definitions developed in Andonova, Betsill and Bulkeley (2009) that were first applied in Bulkeley et al. (2012, 2014).

Given that our criteria are related to the stringency of requirements rather than to impact directly, an additional concern might be the potential trade-off between stringency and participation frequently discussed in the institutional design literature (see, e.g., Bernauer, Kalbhenn, Koubi and Spilker 2013). However, given that the criteria we formulate are very basic, not fulfilling them cannot be compensated by higher attractiveness for participation. No matter how strong the participation, we consider that initiatives that neither provide a mitigation target, nor a baseline, nor incentives for emission reduction, nor any measurement and verification can never generate any plausible alternative to reach the objectives that currently appear unachievable within the UN process.

4. Empirical analysis

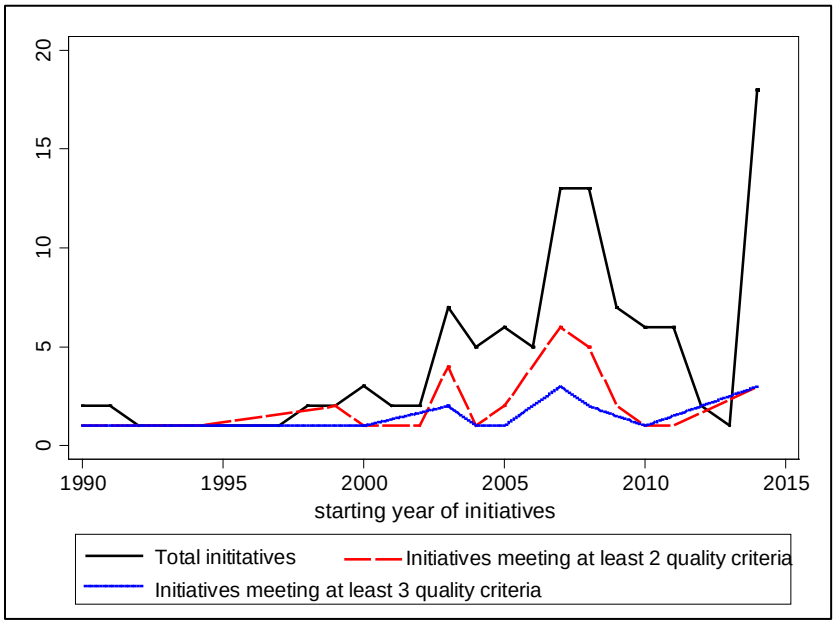
Do TCG initiatives compensate for the lack of dynamics in national politics and in the UNFCCC process? Or does their effectiveness rather depend on functioning regulation at the country and the UN level? Which types of initiatives are most promising? And how much can they be expected to contribute at all given the rather bleak statistics presented above?

We start the empirical investigation with a sketch of the development of existing initiatives to illustrate the variety of programs and models of cooperation. The examples will show what we have in mind when we speak of compensation versus complementarity. Empirical evidence on the emergence of new initiatives suggests that their nature in this respect has changed over time.

The first initiatives created in the early 1990s are mainly exploratory in nature. In the late 1990s and early 2000s, a number of initiatives were set up that directly related to the international mitigation policy architecture. Various carbon funds such as the Prototype Carbon Fund and the BioCarbon Fund were set up by the World Bank to generate emission credits under the Kyoto Mechanisms, and to influence the international rule-making under these mechanisms. In the mid-2000s, when the international carbon market was thriving, a number of NGO or business-led initiatives built around this market, such as the Gold Standard and the Verified Carbon Standard, a standard for the voluntary market. This reflects the coral reef function of the Kyoto Protocol highlighted by Green (2013). The strong mitigation regime on the international and/or national level and the expectation that these policies would be sustained and even reinforced over time put pressure on both public and private actors to find cost-efficient mitigation options. Initiatives such as public-private carbon funds could be triggered by such pressure. The mitigation regime also provided new business opportunities whose exploitation was easier if done in a coordinated fashion, e.g., in the context of defining standards for offsets in voluntary carbon markets that then become "de facto" standards for offset use in mandatory emissions trading systems introduced at a later point in time. The initiatives were thus complementary to the mitigation regime and strengthened it.

The period after the Kyoto Protocol was operational entered into force until the failure of the Copenhagen summit (from 2005 to 2009) also shows a first strong peak of emerging initiatives as well as of initiatives meeting the basic quality criteria outlined above. In contrast, the end of the first commitment period in 2012 without any clear perspective for future binding commitments marks a complete breakdown both regarding the creation of new initiatives, and the creation of quality initiatives (see Figure 2).

Figure 2: The development of new initiatives and new quality-initiatives over time



Notes: The y-axis shows the number of newly created initiatives. The year 2015 is omitted due to incomplete observations.

While the overall number of newly created initiatives picks up again soon after to even reach a new peak in 2014, a much smaller share of these initiatives meets our quality criteria. It seems that the UN Secretary General's climate summit in 2014 was a catalyst for a number of initiatives, and that the UN was eager to showcase climate change-related engagement of sectors outside the UNFCCC process[1]. The UN clearly aimed to mobilize initiatives of a compensatory character, exemplified in the summit's motto "catalyzing action"[2] and the focus on communicating quantitative commitments (United Nations 2014d) even if the underlying initiatives were reluctant to define unequivocal commitments. The orchestration of initiatives took place at a meeting in Abu Dhabi in May 2014 where almost all initiatives eventually announced at the summit had already been defined (United Nations 2014a). Majd (2015) reports that a third of these initiatives focuses primarily on monitoring and evaluation; according to our own assessment, the share of initiatives with formal MRV procedures is only 16%, and the share of initiatives meeting the other quality criteria is equal or even smaller. Only a single initiative specifies mitigation targets.

Hence, while the sheer number of newly emerging initiatives might suggest the success of compensatory strategies and seems to provide evidence for successful orchestration, the examination of quality criteria tells a different story.

[1] The UN stated explicitly that "the Summit is not part of the UN Framework Convention on Climate Change negotiations, and no negotiations related to the convention will take place at the Summit" (United Nations 2014c).

[2] The purpose statement for the summit read "UN Secretary-General Ban Ki-moon has invited world leaders, from government, finance, business, and civil society […] to galvanize and catalyze climate action. He has asked these leaders to bring bold announcements and actions to the Summit that will reduce emissions" (United Nations 2014b)

Yet, some evidence for compensatory activities also exists. On a national level, a number of compensatory initiatives such as the Western Climate Initiative bringing together sub-national entities emerged in the US when it became clear that the US would not ratify the Kyoto Protocol and would not introduce mandatory federal policy instruments. These initiatives became truly transnational when the Canadian government joined the US stance.

Some initiatives have also changed their character over time. The Gold Standard clearly started in 2005 as a complementary initiative aiming to improve the performance of the CDM market. After the crash in prices for CDM credits in 2012, the Gold Standard tried to diversify into the voluntary market as well as into non-mitigation related fields such as generic sustainable development related standards, e.g., for water-related projects. To some extent the Gold Standard now has the character of a compensatory initiative. At the same time, its potential to effectively improve climate change mitigation has clearly deteriorated. Such changes are not reflected in our data as each initiative is only observed once and all characteristics refer to the initiative as originally designed.

Moving away from illustrative examples, let us now relate structural variables to the expected effect on mitigation. We start by presenting some descriptive statistics, in a similar way as Bulkeley et al. (2012), but relate them systematically to our quality indicators.

As our theoretical discussion suggests that especially developing country actors might be directly interested in functioning TCG initiatives to compensate for insufficient UNFCCC dynamics, we first examine their actual role in these initiatives. It appears that there are only three initiatives for which the founding country (the home country of the founding actor or the country in which the foundation took place) is not an OECD country. These are the "Clean Air Initiative" founded in the Philippines in 2001, "Socialcarbon" founded in Brazil in 2008, and the "Panda Standard" founded in China in 2009. All of them focus on MRV, the Chinese one additionally requires a baseline, but none of them have mitigation targets or incentives provided by the initiative. In any case, the three countries do not reflect the typical poor developing country we thought of in the theoretical discussion. Despite their obvious interest in the mitigation of climate change, developing countries do not seem to take over a leadership role when it comes to the set-up of new initiatives. This may be related to their lack of capacity, but also to the difficulties to team up with actors from other countries that would be willing to commit to strong emission reductions. For example, an initiative launched by Tuvalu or other poor small island states, with targets, baselines and MRV procedures matching their strong preference for mitigation, would probably simply not find enough participants.

As also noted by Bulkeley et al. (2012), even if they do not take up a leading role, developing country actors do participate in TCG initiatives. Table 1 shows that there is only one initiative (the "Asian Cities Climate Change Resilience Network" focusing only on adaptation) that includes developing country members only. The remainder of the initiatives is spread relatively evenly between initiatives with no, low, medium and high shares of developing country actors. For the purpose of constructing this membership variable, countries are considered as "developing" if they do not have emission reduction commitments under the Kyoto Protocol (non-Annex I). The table also relates developing country membership to our count of the quality criteria. The association is relatively weak and not significant: a stronger presence of developing country actors does not lead to better initiatives. In fact, most of the most highly rated initiatives fall in the category of no developing country membership (10 initiatives rated 3). Many initiatives with a high or medium share of developing countries focus primarily on networking and information exchange. It seems that developing country actors lack the capacity and/or the power to involve others into more strongly mitigation-oriented activities that would be in line with pour countries' preferences. This confirms a concern already raised by Bulkeley et al. (2012:601).

Table 1: Developing country participation and TCG quality

Share of non-Annex I members	Sum of individual quality indicators					
	0	1	2	3	4	Total
Zero	14	7	6	10	1	38
	(37%)	(18%)	(16%)	(26%)	(3%)	(100%)
Low	13	9	4	1	0	27
	(48%)	(33%)	(15%)	(4%)	(0%)	(100%)
medium	13	6	2	0	0	21
	(62%)	(29%)	(10%)	(0%)	(0%)	(100%)
High	10	5	4	3	0	22
	(45%)	(23%)	(18%)	(14%)	(0%)	(100%)
Only	1	0	0	0	0	1
	(100%)	(0%)	(0%)	(0%)	(0%)	(100%)
Total	51	27	16	14	1	109
	(47%	(25%)	(15%)	(13%)	(1%)	(100%)

Notes: Numbers in brackets refer to row percentages. The categories for the share (s) of non-Annex I membership are: 'only': s=100%, 'high': 100%>s>50%, 'medium': 50%≥s>25%, 'low': 25%≥s>0%, 'zero': s=0%.
The association between the two variables is insignificant (Cramer's V = 0.20, p-value = 0.40).

In addition, we are interested in the quality measures for the three groups of actors considered in the theoretical analysis, and in the score of these measures for initiatives orchestrated by governments and/or international organizations. To distinguish the actor groups, we use the categories 'entrepreneurial' (non-state actors played the leading role in initiating) and 'transgovernmental' (only sub-state actors were responsible for creation) as defined in the Roger et al. (2015) dataset. To specifically analyze non-firm private actors, we further use an indicator variable 'NGO members' for NGOs being key actors involved. Note that the three categories are not mutually exclusive as several groups can be involved as key actors in a given initiative. At the same time, a few initiatives do not fall in any of the categories, e.g., when they are orchestrated by international organizations and do not have relevant NGO membership.

Table 2 shows that we observe 36 initiatives with entrepreneurial, and 16 initiatives with transgovernmental character, as well as 58 initiatives with significant NGO participation. The table does not reveal any obvious differences in the quality of these initiatives. A few differences can be observed as to which of the criteria (if any) the initiatives focus on. Entrepreneurial initiatives rarely provide incentives, but more MRV than transgovernmental initiatives and initiatives with strong NGO participation. However, in all groups, the majority of initiatives meet none or only one of our basic quality criteria.

Table 2: Quality by actor group and corresponding type of cooperation

Key actors or type of cooperation	Sum of individual quality indicators					
	0	1	2	3	4	Total
Entrepreneurial	10	13	11	1	1	36
	(28%)	(36%)	(31%)	(3%)	(3%)	(100%)
Transgovernmental	8	4	0	4	0	16
	(50%)	(25%)	(0%)	(25%)	(0%)	(100%)
NGO members	28	13	9	7	1	58
	(48%)	(22%)	(16%)	(12%)	(2%)	(100%)

Notes: Numbers in brackets refer to row percentages. Column totals are not provided as the categories are not mutually exclusive.

When looking at initiatives orchestrated by international organizations or national governments, the overall situation looks very similar. According to our quality indicators, expected effectiveness is not significantly higher or lower than for

non-orchestrated ones (Cramer's V = 0.11, p-value = 0.86). But here, the focus on specific types of criteria is even more obvious than for our above described actor-related categories: Not a single out of 50 orchestrated activities has clearly defined mitigation targets, while – relative to other initiatives – a very high share of the orchestrated initiatives are incentives-based (see Table 3).

Table 3: The focus of orchestrated initiatives

Quality criterion	Mean for orchestrated initiatives	Mean for non-orchestrated initiatives	p-value (t-test of equality of means)
Q_MitigatigationTarget	0%	20%	0.00
Q_Incentives	42%	5%	0.00
Q_Baseline	43%	29%	0.78
Q_MRV	49%	51%	0.26
Observations	50	59	

All in all, our discussion of the empirical evidence has now established three results: First, initiatives of all the different categories considered score similarly poorly when it comes to a closer scrutiny of basic quality criteria. While their focus is different, they mostly fulfill only one or even none of these criteria. Second, the participation of developing country actors who should have the most direct interest in effective climate change mitigation does not change anything in this regard. While they participate in many initiatives, they do not seem to be in the driver's seat and are unable to impose stricter criteria on other participants. Third, there is some evidence for both, initiatives that were established to complement existing domestic or international regulation, and initiatives that partially compensate for missing (or reduced) regulation. We can only speak of partial compensation since – given the results on the quality criteria – we cannot expect any of these initiatives to have a major effect on reaching the 2° target agreed upon at the level of the UNFCCC.

As the bivariate correlations and the descriptive discussion so far could not establish any clear link between individual factors and the quality of the initiatives, we will proceed with a multivariate analysis in the following. In this context, we will systematically test the relationship of combinations of the variables discussed above with all of our different quality indicators. Moreover, we will examine interactions with (i) a variable indicating the existence of a national target and (ii) variables indicating the successful and less successful periods of the UNFCCC regime, so that the question of complementarity versus partial compensation can also be tested systematically for the different subgroups of initiatives. This will allow us to formally test the hypotheses lines out in our theory section.

As all dependent variables are categorical, a discussion of the appropriate statistical model seems of order. Quality1 is a count variable with values between zero and four, and the other two summary variables (Quality2 and Quality3 for at least 2 or 3 conditions fulfilled respectively) as well as the individual variables for each of the criteria are binary indicators. One could hence consider a Poisson or negative binomial model for Quality1 and logit or probit models for the other dependent variables. In terms of the goodness of fit statistics, Poisson seems to work fine (no indication of overdispersion). This led us to carry out a set of initial regressions using Poisson and Probit models the results of which can be obtained from the authors upon request.

However, there are a number of problems with these specifications. First, the results of non-linear models are difficult to interpret in a setting with (multiple) interaction terms. As shown by Ai and Norton (2003) for probit and logit models, not even the size and significance of interaction terms can be directly interpreted. It is obviously possible to separately compute the difference in predicted probability for any combinations of initial conditions, and hence the marginal effects. However, given that not only the dependent variables, but also the explanatory variables are mostly categorical,

not all the combinations of initial conditions actually exist in the data. Moreover, depending on the dependent variable, some variable combinations perfectly determine the outcome so that they are dropped from the model along with the corresponding observations. While this is fine for the interpretation of the individual model, it leads to different specifications and different samples depending on the dependent variable thereby impeding comparisons across models. Finally, the structure of the data suggests that there might be multiple correlations between the error terms due, for instance, to the participation of the same actors in different initiatives. Binary response models are inconsistent in this case, and "robust" estimation cannot mitigate the problem (Greene 2002, p. 673f.).

To avoid these problems and to facilitate the presentation of results, we hence proceed with simple linear models in the following. In all models, we use heteroscedasticity consistent error terms that are also clustered by founding country (or organization). Tables 4-6 present the results. In Table 4 the focus is on complementarity to versus substitution of domestic mitigation policy, in Table 5 the perspective is shifted to international policy, i.e., the UNFCCC process. Finally, Table 6 provides some more insights in the role of orchestration. While we restrict ourselves to the inclusion of a basic set of variables in these main regressions, Tables A2-A4 in the appendix replicate each of the models with a larger set of control variables (notably including economic, political and emission-related information of the founding country).

One difficulty is that some information, especially for these additional controls, but also for the country target included in the main regressions, is not available (in fact, not defined) for those cases in which no single founding country could be defined, i.e., initiatives set up by international organizations. In this case, the value of these variables is set to zero. Dummies for the World Bank (WB), the European Union (EU) and other initiatives set up by an international organization (INT) are included in all models to absorb the effect of this coding procedure. All models further include a control for the starting year of the initiative to account for possible time trends driven by learning effects or the like. All variables are explained in detail in the appendix (Table A1).

Throughout all models (in all tables), the role of governments in facilitating the start of the initiative ('Depends on gov.') seems to play an important role. Support by a government increases the summary measure of quality (Quality1) by more than one point and raises the probability to achieve a positive score on Quality2 and 3 as well as on most of the individual criteria by over 50%. A general exception is the mitigation target. This is plausible since a country can be expected to set its mitigation target through other means, so that this is not what governments would primarily encourage TCG initiatives to do. Among the other individual criteria, the effect is the smallest (and least significant) for MRV – probably because generally, most initiatives focus on this aspect.

Another variable that quite robustly shows a positive association with the quality of TCG initiatives is the existence of country targets. Regarding the coefficient estimates for the individual quality criteria, the effect is at times only marginally significant or not significant at all, but the aggregate effect is always significant at least for one of the three overall quality measures. This provides a first indication of relevant complementarities between effective TCG initiatives and national regulation. The complementarities that other authors in this volume find between the creation of new initiatives and government regulation hence also exist regarding the substantial quality of these initiatives.

Note that in Table 4 (and Table A2) the coefficient estimates and significance of this variable have to be interpreted differently than in the other tables as the variable also enters in different interaction terms to explore complementarity with the engagement of individual actors. The coefficient of the variable itself only refers to those initiatives that are neither entrepreneurial, nor transgovernmental, nor driven by a relevant number of NGOs.

Before discussing the interaction effects, let us consider the remaining variables of the standard specification. We include one variable that refers to the structure of the initiatives whereby higher values indicate more decentralized initiatives (i.e., not coordinated or centralized). More decentralized initiatives seem to have mitigation targets slightly

more often than other initiatives (small positive coefficient, marginally significant in Table 5 and almost significant in Table 4 – see regression (4) of both tables), but are negatively associated with the other criteria. This tends to be reflected in a significant negative effect on the overall quality measures (see, e.g., Table 4, regressions (1) and (2)).

We further separately consider initiatives focusing on adaptation. While it might have been possible that they simultaneously undertake significant measures to enhance mitigation efforts, this does not seem to be the case. The coefficient estimates are always negative, sometimes significantly so.

Let us now get to the main variables of interest in Table 4, namely the actor types and their interaction with the domestic target. In the absence of country targets, the overall association of entrepreneurial initiatives with TCG quality tends to be negative. Regression (2) for instance, indicates that the probability that entrepreneurial initiatives meet at least two out of our four basic quality conditions is 10% lower than for other initiatives. The existence of a country target does not seem to matter much in this context as all interaction terms are insignificant. The overall negative assessment is consistent with other evaluations of voluntary agreements of companies that have been found mostly to represent business as usual (Baranzini and Thalmann 2004) or to focus on the least costly measures that still guarantee recognition by the market (Berliner and Prakash 2015). It should be noted, however, that in our estimations, the negative association is not homogeneous across all quality criteria. Entrepreneurial initiatives seem to do relatively well regarding the specification of mitigation targets, which is the least frequently met criterion otherwise. In addition there are individual entrepreneurial activities that score really highly, so that there is no significant effect with respect to the Quality3 indicator. This reflects the findings of our descriptive analysis in Table 2 (showing one entrepreneurial initiative meeting three, and one meeting all four criteria).

As opposed to entrepreneurial initiatives, in the absence of domestic regulation, transgovernmental initiatives are clearly positively associated with the initiatives' quality overall. All three overall quality indicators are positive and significant. However, if there is a domestic target, the effect is reversed. It seems that, in line with our theoretical argumentation, transgovernmental actors compensate (at least partly) for the lack of regulation by ensuring some minimum quality of TCG initiatives. When there is a national target (and corresponding regulation), they do not seem to see the requirement for their own quality insurance activities any more. This also explains why our bivariate analysis in Table 2 did not reveal the underlying relationship. Interestingly, with respect to the incentives related sub-indicator (regression (5)) the relationship is reverse. It appears that sub-national entities engage for incentive-based initiatives in a way that complements (rather than to substitute for) domestic regulation. Maybe in this specific context, the intention is to financially support private companies in the sub-national constituencies in meeting the requirements of national regulation.

Again in line with our theoretical argument, initiatives in which NGOs play a prominent role tend to be compensating in a similar way as transgovernmental initiatives. While the association is less clearly significant, there is evidence for a positive effect of NGO participation when there is no country target [the overall effect is significant for Quality3 (see regression (3) and primarily works through a higher share of incentive-based mechanisms (see regression (5))], and a reversal of this effect indicated by negative coefficients of similar size when such a country target is present.

In sum, we observe that, independently of the different actors involved, the quality of TCG initiatives benefits from national regulation. Regarding the activities of individual actors our results point at some partial compensation by NGO and transgovernmental initiatives, while no such effect can be observed for entrepreneurial initiatives. This is in line with our theoretical discussion that predicted effective complementary activities at best for private companies, and some potential for compensatory activities at the level of sub-national entities and NGOs.

Table 4: Correlates of TCG quality – examining complementarity with national policy

	(1) Quality1	(2) Quality2	(3) Quality3	(4) Q_MitigationTarget	(5) Q_Incentives	(6) Q_Baseline	(7) Q_MRV
Depends on gov.	1.49***	0.58***	0.77***	0.00	0.62***	0.54***	0.32**
	(0.00)	(0.00)	(0.00)	(0.98)	(0.00)	(0.00)	(0.03)
Country Target	1.14*	0.35*	0.45*	0.18	0.29*	0.35	0.32
	(0.07)	(0.10)	(0.06)	(0.14)	(0.07)	(0.11)	(0.44)
Structure	-0.36***	-0.16**	-0.01	0.04	-0.04	-0.17**	-0.20***
	(0.00)	(0.03)	(0.80)	(0.11)	(0.46)	(0.04)	(0.00)
Adaptation focus	-0.82	-0.26	-0.21	-0.06	-0.14	-0.24	-0.38*
	(0.12)	(0.20)	(0.14)	(0.17)	(0.44)	(0.20)	(0.07)
Entrepreneurial	-0.14**	-0.10***	0.05	0.03*	-0.05	-0.09**	-0.02
	(0.04)	(0.00)	(0.11)	(0.10)	(0.10)	(0.02)	(0.48)
Target x Entrepr.	0.37	0.20	-0.12	0.11	0.04	0.16	0.05
	(0.24)	(0.15)	(0.27)	(0.36)	(0.37)	(0.23)	(0.58)
Transgovernmental	0.39***	0.08*	0.19***	0.18***	-0.09**	0.09**	0.20***
	(0.00)	(0.07)	(0.00)	(0.00)	(0.02)	(0.03)	(0.00)
Target x Transg.	-0.65*	-0.15	-0.24***	-0.21*	0.21**	-0.16	-0.49***
	(0.07)	(0.19)	(0.00)	(0.08)	(0.05)	(0.15)	(0.01)
NGO members	0.32	0.06	0.21*	0.06	0.18***	0.09	-0.01
	(0.15)	(0.34)	(0.10)	(0.13)	(0.00)	(0.41)	(0.91)
Target x NGOs	-0.42	-0.04	-0.19	-0.11*	-0.16**	-0.10	-0.05
	(0.18)	(0.57)	(0.17)	(0.07)	(0.01)	(0.36)	(0.85)
EU	1.21***	0.36***	0.42***	0.89***	-0.16	0.35***	0.14
	(0.01)	(0.00)	(0.00)	(0.00)	(0.15)	(0.00)	(0.39)
WB	0.50	0.18	0.13	0.07	0.29	0.08	0.05
	(0.45)	(0.40)	(0.61)	(0.47)	(0.11)	(0.72)	(0.89)
INT	0.61	0.24	0.24	0.00	0.32**	0.20	0.09
	(0.30)	(0.18)	(0.27)	(0.98)	(0.04)	(0.23)	(0.82)
Year	-0.02	-0.00	-0.00	-0.00	-0.01	-0.00	-0.02**
	(0.18)	(0.82)	(0.82)	(0.92)	(0.13)	(0.99)	(0.03)
Constant	47.38	3.97	2.92	1.35	13.98	0.58	31.47**
	(0.17)	(0.81)	(0.84)	(0.93)	(0.13)	(0.97)	(0.03)
Adj. R2	0.46	0.39	0.45	0.15	0.50	0.36	0.34
N	109	109	109	109	109	109	109

Note: Linear regression models with p-values in parentheses based on robust standard errors (heteroscedasticity consistent and clustered by founding country); ***, ** and * indicate significance at the 1%-, 5%- and 10%-level respectively.

We now turn to the same issues with respect to international regulation (see Table 5). To mark the ups and downs of the UNFCCC system, we distinguish between the period of success since 2005 when the Kyoto Protocol became operational, and the period of failure after 2009 when the failure of the Copenhagen summit marked the start of a new period of uncertainty, without clear expectations about future commitments. We construct corresponding indicator variables, i.e. 'Koto operational' (2005-2009) and 'Post Copenhagen' (2010-2015), the reference period being the period before 2005. Both variables are then interacted with the three variables indicating entrepreneurial and transgovernmental initiatives as well as those with strong NGO membership. A positive interaction term with 'Kyoto operational' and a negative interaction term with 'Post Copenhagen' indicate that the actors tended to initiate relatively effective TCG initiatives as a complement to functioning international rules, while the reversed signs indicate substitution.

Table 5: Correlates of TCG quality – examining complementarity with international policy

	(1) Quality1	(2) Quality2	(3) Quality3	(4) Q_MitigationTarget	(5) Q_Incentives	(6) Q_Baseline	(7) Q_MRV
Depends on gov.	1.44***	0.55***	0.70***	0.04	0.57***	0.50***	0.33*
	(0.00)	(0.00)	(0.00)	(0.47)	(0.00)	(0.00)	(0.05)
Country Target	1.05*	0.35*	0.35*	0.16	0.24	0.35**	0.30
	(0.09)	(0.08)	(0.08)	(0.23)	(0.11)	(0.04)	(0.50)
Structure	-0.30	-0.14	-0.02	0.07*	-0.02	-0.16	-0.20***
	(0.12)	(0.12)	(0.79)	(0.08)	(0.77)	(0.13)	(0.00)
Adaptation focus	-0.73*	-0.24	-0.17*	-0.02	-0.13	-0.22	-0.36*
	(0.09)	(0.18)	(0.09)	(0.55)	(0.40)	(0.11)	(0.05)
Kyoto operational	-0.31	0.02	-0.21	-0.10	-0.08	-0.17	0.04
	(0.54)	(0.96)	(0.24)	(0.55)	(0.57)	(0.64)	(0.89)
Post Copenhagen	0.17	0.13	-0.03	-0.03	-0.02	0.02	0.19
	(0.78)	(0.70)	(0.89)	(0.89)	(0.93)	(0.96)	(0.63)
Entrepreneurial	-0.00	0.07	-0.13	0.11	-0.12	-0.08	0.09
	(0.99)	(0.73)	(0.32)	(0.26)	(0.25)	(0.73)	(0.56)
Kyoto x Entrepr.	0.69*	0.14	0.14	0.16*	0.14	0.29	0.10
	(0.08)	(0.40)	(0.30)	(0.07)	(0.36)	(0.21)	(0.73)
Copenh. x Entrepr.	-0.50**	-0.18	0.03	-0.21*	0.12	-0.05	-0.36**
	(0.05)	(0.28)	(0.80)	(0.09)	(0.33)	(0.82)	(0.04)
Transgovernmental	-0.93	-0.20	-0.30	-0.17	-0.05	-0.28	-0.43
	(0.13)	(0.47)	(0.32)	(0.37)	(0.77)	(0.34)	(0.17)
Kyoto x Transg.	1.32	0.35	0.57	0.16	0.24	0.50	0.43
	(0.16)	(0.34)	(0.15)	(0.39)	(0.29)	(0.25)	(0.30)
Copenh. x Transg.	1.29***	0.22	0.40	0.49***	0.04	0.28	0.48
	(0.01)	(0.34)	(0.10)	(0.00)	(0.83)	(0.22)	(0.11)
NGO members	0.16	0.15	0.04	-0.01	0.16	0.05	-0.03
	(0.73)	(0.41)	(0.87)	(0.91)	(0.23)	(0.83)	(0.90)
Kyoto x NGOs	-0.03	-0.14	0.12	0.04	-0.03	0.00	-0.05
	(0.94)	(0.58)	(0.57)	(0.81)	(0.79)	(0.99)	(0.75)
Copenh. x NGOs	-0.20	-0.14	0.01	-0.04	-0.17	-0.06	0.06
	(0.72)	(0.56)	(0.97)	(0.70)	(0.20)	(0.82)	(0.82)
EU	1.32***	0.33***	0.43***	0.99***	-0.07	0.32***	0.08
	(0.00)	(0.00)	(0.00)	(0.00)	(0.55)	(0.00)	(0.59)
WB	0.74	0.25	0.20	0.13	0.33*	0.15	0.13
	(0.23)	(0.24)	(0.35)	(0.28)	(0.07)	(0.40)	(0.74)
INT	0.88	0.27	0.32*	0.10	0.30*	0.26*	0.22
	(0.15)	(0.14)	(0.09)	(0.37)	(0.05)	(0.08)	(0.62)
Year	-0.05	-0.01	-0.01	-0.00	-0.00	-0.00	-0.03
	(0.18)	(0.64)	(0.67)	(0.80)	(0.66)	(0.79)	(0.14)
Constant	91.35	16.19	12.43	7.83	3.49	10.22	69.82
	(0.18)	(0.64)	(0.68)	(0.81)	(0.68)	(0.78)	(0.14)
Adj. R2	0.48	0.37	0.45	0.17	0.47	0.35	0.32
N	109	109	109	109	109	109	109

Note: Linear regression models with p-values in parentheses based on robust standard errors (heteroscedasticity consistent and clustered by founding country); ***, ** and * indicate significance at the 1%-, 5%- and 10%-level respectively.

Examining entrepreneurial initiatives first, we find indications of complementarity with significant coefficients in regressions (1) for Quality1, (4) for mitigation targets, and (7) for MRV (where, however, only the negative coefficient for the interaction term with 'Post Copenhagen' is significant). This provides some confirmation for our theoretical argument (and the anecdotal evidence discussed earlier) that private companies come up with effective initiatives when rules and regulation lead them to expect that some costly action is unavoidable. While we did not find this effect with respect to domestic regulation, the effect with respect to international regulation appears quite clear.

As in the context of national regulations, transgovernmental initiatives rather tend to be substituting for ineffective regulation at the international level. While transgovernmental TCG initiatives did not stand out for particular effectiveness during the high time of the Kyoto Protocol, positively significant coefficient estimates for the summary indicator Quality1 (regression (1)) and for the definition of mitigation targets (regression (4)) indicate partial compensation for the lack of progress at the level of the UNFCCC. The substantial effect on Quality1 is strong indicating that on average, in the period after the Copenhagen summit, newly initiated transgovernmental TCG initiatives met

more than one criterion more than in earlier periods. These results are again in line with our theoretical arguments. Only for initiatives with strong NGO membership, we do not find any significant effects. As before results are generally confirmed by the regressions with further control variables in the appendix (Table A3), although results for entrepreneurial initiatives are somewhat less significant, while results for transnational ones are even more significant than presented here.

We finally analyze the role of national governments' or international organizations' orchestration in some more detail. As already mentioned earlier, the role of governments in getting the initiatives started has a robust positive effect on quality, mostly significant and with high coefficient estimates, except for the criterion of mitigation targets. Beyond this, we do not find any specific effects for the initiation of TCG initiatives. However, as shown in Table 6, we find a number of interesting effects with respect to shaping. In particular, the interaction term with the 'Post Copenhagen' dummy is generally large, positive, and highly significant. This is consistent with an attempt of national governments and/or international organizations to compensate the lack of effective international regulation by the support of effective TCG initiatives. Only with respect to the incentive criterion, the effect is quite different (see regression (5)). It appears that in this context, shaping was relatively most successful in the period before Kyoto became operational, while other, non-shaped initiatives focused more on incentives thereafter.

Given that the World Bank is a major player in the orchestration of TCG initiatives, one might imagine that the largely compensating effect is driven by the Bank's interventions. To test for this, we also interact the period dummies with the dummy for the World Bank as the founding agent. It becomes clear that the partially compensating focus on quality in the post-Copenhagen period is not due to World Bank engagement. At the exception of the mitigation target the association between World Bank founded initiatives and quality was highest in the period before Kyoto became operational, and lower both during the high time of the Kyoto Protocol and after the Copenhagen conference. All results are again confirmed by the corresponding regression table in the appendix (Table A4).

In sum, our empirical results are largely in line with theoretical expectations. While there is no evidence for any kind of compensatory move by private firms, and in fact some evidence for complementary activities highlighting the importance of prior international regulation, some attempts to substitute effective TCG initiatives for lacking national and international regulation can be observed by sub-national governments (transgovernmental initiatives) and NGOs (the latter only at national level). However, given the poor overall quality of the initiatives measured in terms of the four basic process criteria mitigation target, incentives, baseline and MRV our results give no reason to believe that transgovernmental initiatives and NGOs will ever make up for a failure to reach an agreement on appropriate commitments at the level of the UNFCCC. Given that sub-national governments react on the preferences of their constituencies, and that these constituencies are influenced by media reports discussing the negative consequences of climate change, one may also wonder how long even the partially compensating efforts of sub-national governments will last in the future if a further failure to reach a substantial international agreement leads to a fading out of the UNFCCC process and a related reduction of media coverage and public interests. Those countries (and generations) whose interests are affected most negatively by global climate change do not seem to have any more leverage within TCG initiatives than within the global negotiation process.

Table 6: Correlates of TCG quality – examining leadership roles in conjunction with international policy

	(1) Quality1	(2) Quality2	(3) Quality3	(4) Q_MitigationTarget	(5) Q_Incentives	(6) Q_Baseline	(7) Q_MRV
Depends on gov.	1.14***	0.45***	0.75***	-0.08	0.56***	0.44***	0.22
	(0.00)	(0.00)	(0.00)	(0.41)	(0.00)	(0.00)	(0.19)
Country Target	0.91	0.33**	0.32	0.19**	0.22	0.28*	0.23
	(0.14)	(0.04)	(0.18)	(0.03)	(0.21)	(0.10)	(0.56)
Structure	-0.45***	-0.19***	-0.03	0.02	-0.02	-0.20***	-0.24***
	(0.00)	(0.00)	(0.51)	(0.44)	(0.61)	(0.01)	(0.00)
Adaptation focus	-0.78**	-0.24	-0.12	-0.13**	-0.14	-0.16*	-0.35**
	(0.04)	(0.15)	(0.15)	(0.05)	(0.41)	(0.07)	(0.04)
Kyoto operational	0.10	0.02	-0.01	-0.04	0.01	0.07	0.06
	(0.77)	(0.87)	(0.89)	(0.49)	(0.89)	(0.63)	(0.82)
Post Copenhagen	0.15	0.03	0.03	-0.03	-0.03	0.07	0.14
	(0.75)	(0.88)	(0.87)	(0.83)	(0.78)	(0.71)	(0.76)
Shaping	0.12	0.01	0.13	-0.11	0.37***	0.05	-0.19
	(0.72)	(0.96)	(0.49)	(0.21)	(0.00)	(0.73)	(0.35)
Kyoto x Shaping	-0.31	0.09	-0.17	-0.01	-0.43***	0.05	0.08
	(0.62)	(0.73)	(0.39)	(0.91)	(0.00)	(0.83)	(0.81)
Copenh. x Shaping	1.64***	0.99***	-0.17	0.07	-0.41***	0.95***	1.03***
	(0.00)	(0.00)	(0.39)	(0.41)	(0.00)	(0.00)	(0.00)
Kyoto x WB	-0.98***	-0.35***	-0.36***	0.09**	-0.05	-0.76***	-0.26
	(0.00)	(0.00)	(0.00)	(0.02)	(0.38)	(0.00)	(0.14)
Copenh. x WB	-0.62**	-0.32***	0.00	-0.00	-0.01	-0.35***	-0.26
	(0.03)	(0.01)	(0.99)	(1.00)	(0.84)	(0.00)	(0.28)
EU	0.90***	0.23**	0.42***	0.81***	-0.04	0.26**	-0.12
	(0.00)	(0.02)	(0.00)	(0.00)	(0.21)	(0.02)	(0.22)
WB	1.11	0.44*	0.22	0.07	0.35	0.44*	0.25
	(0.14)	(0.07)	(0.47)	(0.34)	(0.11)	(0.08)	(0.56)
INT	0.53	0.16	0.29	0.03	0.28	0.14	0.08
	(0.39)	(0.28)	(0.22)	(0.77)	(0.11)	(0.36)	(0.84)
Year	-0.03	-0.00	-0.00	0.00	-0.00	-0.00	-0.03
	(0.39)	(0.85)	(0.87)	(0.99)	(0.66)	(0.82)	(0.35)
Constant	63.71	6.67	4.86	-0.20	3.78	8.37	51.76
	(0.38)	(0.85)	(0.88)	(0.99)	(0.67)	(0.81)	(0.34)
Adj. R2	0.47	0.43	0.42	0.10	0.45	0.44	0.35
N	109	109	109	109	109	109	109

Note: Linear regression models with p-values in parentheses based on robust standard errors (heteroscedasticity consistent and clustered by founding country); ***, ** and * indicate significance at the 1%-, 5%- and 10%-level respectively.

5. Conclusions

There is an increasing perception that the multilateral climate negotiation process under the UNFCCC is unable to harness sufficient greenhouse gas mitigation to reach the internationally agreed target of keeping global warming below 2°C. Thus transnational climate governance initiatives are seen by many observers as opportunities to achieve significant mitigation outside of the UNFCCC, i.e., to compensate for lacking political will at the level of national governments. Is this really the case or is the role of such initiatives rather a complementary one so that we can expect them to contribute to emission reduction only in combination with existing regulation at the international and domestic level? Under which conditions can these initiatives be expected to achieve any mitigation at all?

We assess 109 transnational initiatives through a simple mitigation quality indicator that is determined by the existence of a mitigation target, the provision of incentives for mitigation, the specification of a baseline from which mitigation is determined and the existence of provisions for MRV of mitigation. About half of the initiatives do not fulfil any of these basic quality criteria, while a tenth meets three of them. Only one initiative satisfies all four criteria. This is a rather sobering result to start with and does not suggest that they might constitute any relevant alternative to the UNFCCC process.

Looking at the setup of initiatives over time, we find that initiatives with relatively high quality emerged during the time after entry into force of the Kyoto Protocol in 2005, but that after the failure of the Copenhagen conference in 2009 their quality declined. Particularly the flurry of initiatives linked to the UN Secretary General's Climate Summit in 2014 showed rather low quality. This again illustrates that these initiatives do not provide an effective alternative to the UNFCCC system. They can, however, be valuable complements.

Our statistical analysis reveals that the above result is particularly true for entrepreneurial initiatives. The few cases of effective entrepreneurial activities (meeting more than two of the above criteria) can be seen as complements to regulation in the context of the Kyoto Protocol. Initiatives launched by sub-national governments or supported by a large number of NGOs do show some attempt to compensate for lacking national and international regulation. But there overall quality is also too poor to provide a credible alternative.

Some other variables are statistically linked to our measures of quality. Initiatives orchestrated by governments or international institutions focus more on incentives but are lacking mitigation targets. Generally, government support in setting up an initiative is positively linked to its quality. If the country where an initiative started has an emission target, the quality of the initiative is significantly better. Orchestration by the World Bank played an important role in the pre-2005 period but does not have any compensatory character post-2009.

As many poor developing countries are particularly vulnerable to global climate change, we also examine their role in transnational climate governance initiatives. It is striking that only a very small subset of initiatives was founded in developing countries. Moreover, the participation of developing country actors does not significantly improve the quality of an initiative. It seems that vulnerable countries with strong preferences for climate change mitigation do not have any stronger role within these initiatives than within the international system as a whole.

In sum, the ambition of transnational climate initiatives is way too low to compensate for the deadlock at the level of the UNFCCC and the lack of significant emission reduction commitments by national governments. This holds for all types of initiatives, no matter whether the key actors are private firms, sub-national governments or NGOs. In addition, the initiatives' mitigation ambition often directly depends on the willingness to mitigate that results from the international climate negotiation process. Hence, the initiatives cannot be expected to make up for lack of ambition of the UNFCCC process.

6. References

Ai, Chunrong, and Edward Norton. 2003. "Interaction Terms in Logit and Probit Models." *Economics Letters* **80** (1): 123-129.

Andonova, Liliana, Michele Betsill and Harriet Bulkeley. 2009. "Transnational Climate Governance." *Global Environmental Politics* **9**(2): 52-73.

Andonova, Liliana, Thomas Hale, and Charles Roger. 2014. How Do Domestic Politics Condition Participation In Transnational Climate Governance? Paper presented at Political Economy of International Organizations (PEIO) conference. Princeton, January 16-18. <www.peio.me> (2014, January 16).

Baranzini, Andrea, and Philippe Thalmann. 2004. *Voluntary approaches in climate policy.* Cheltenham: Edward Elgar.

Beck, Thorsten, George Clarke, Alberto Groff, Philip Keefer, and Patrick Walsh. 2001. "New tools in comparative political economy: The Database of Political Institutions." *World Bank Economic Review* **15**(1): 165-176.

Berliner, Daniel, and Aseem Prakash. 2014. "Public Authority and Private Rules: How Domestic Regulatory Institutions Shape the Adoption of Global Private Regimes." *International Studies Quarterly* **58**(4): 793-803.

Berliner, Daniel, and Aseem Prakash. 2015. "'Bluewashing' the Firm?: Voluntary Regulations, Program Design and Member Compliance with the United Nations Global Compact." *Policy Studies Journal* **43**(1): 115-138.

Bernauer, Thomas, Anna Kalbhenn, Vally Koubi, and Gabriele Spilker. 2013. "Is There a "Depth versus Participation" Dilemma in International Cooperation?" *Review of International Organizations* **8**(4): 477-497.

Bulkeley, Harriet, Liliana Andonova, Karin Bäckstrand, Michele Betsill, Daniel Compagnon, Rosaleen Duffy, Ans Kolk, Matthew Hoffmann, David Levy, Peter Newell, Tori Milledge, Matthew Paterson, Philipp Pattberg, Stacy VanDeveer. 2012. "Governing Climate Change Transnationally: Assessing the Evidence from a Database of Sixty Initiatives." *Environment and Planning C: Government and Policy* 30: 591-12.

Bulkeley, Harriet, Liliana Andonova, Michele M. Betsill, Daniel Compagnon, Thomas Hale, Matthew Hoffmann, Peter Newell, Matthew Paterson, Charles Roger, Stacy VanDeveer. 2014. *Transnational Climate Governance*. Cambridge, UK: Cambridge University Press.

Cao, Xun, and Hugh Ward. 2015. "Transnational Climate Governance Networks and Domestic Regulatory Action." *International Interactions* (this volume).

Chan, Sander, and Pieter Pauw. 2014. *A global framework for climate action: orchestrating non-state and subnational initiatives for more effective global climate governance*. Discussion Paper 34/2014 Bonn: German Institute for Development.

Darnall, Nicole, and Younsung Kim. 2012. "Which Types of Environmental Management Systems Are Related To Greater Environmental Improvements?" *Public Administration Review* **72**(3): 351-365.

Deleon, Peter, and Jorge E. Rivera, eds. 2009. *Voluntary Environmental Programs: A Policy Perspective*. Boulder: Rowman & Littlefield.

Dolšak, Nives, and Aseem Prakash. 2015. "Join the Club: How Domestic NGOs Induce Participation in the Covenant of Mayors Program." *International Interactions* (this volume).

Ecofys; Climate Analytics; PIK and New Climate Institute. 2014. Climate Action Tracker. <http://climateactiontracker.org/countries.html> (2015, July 28).

Galvanizing the Groundswell of Climate Actions. 2015. Accelerating the Action Agenda through Robust and Credible Climate Commitments from Non-state Actors, <http://static1.squarespace.com/static/552be32ce4b0b269a4e2ef58/t/55aff450e4b0e464348417ac/1437594704526/Accelerating+the+Action+Agenda+through+Robust+and+Credible+Climate+Commitments+from+Non-state+Actors+NEW.pdf> (2015, July 28)

German Development Institute, London School of Economics. 2015. GAFCA – Global Aggregator for Climate Action. <http://static1.squarespace.com/static/552be32ce4b0b269a4e2ef58/t/558d8fa1e4b0cba66cbefa29/1435341166099/Introducing+GAFCA.pdf> (2015, July 28)

Green, Jessica. 2013. "Order out of Chaos: Public and Private Rules for Managing Carbon." *Global Environmental Politics* **13**(2): 1-25.

Green, Jessica. 2015. "Blurred Lines: Why do states recognize private carbon standards?" *International Interactions* (this volume).

Greene, William. 2002. *Econometric Analysis*. 5th ed. Upper Saddle River: Prentice-Hall.

Hale, Thomas, and Charles Roger. 2014. "Orchestration and Transnational Climate Governance." *Review of International Organizations* **9**(1): 59-82.

Helm, Carsten, and Detlef Sprinz. 2000. "Measuring the Effectiveness of International Environmental Regimes." *Journal of Conflict Resolution* **44**(5): 630-652.

Hoffmann, Matthew J. 2011. *Climate Governance at the Crossroads. Experimenting with a Global Response after Kyoto.* Oxford, UK: Oxford University Press.

Hollande, François. 2015. Speech by François Hollande at the World Summit Climate & Territories 1-2 July in Lyon. In *Outcomes of the Summit*: 83-87. <http://en.rhonealpes.fr/1197-world-climate-summit-2015-en.htm> (2015, September 6).

Hsu, Angel, Andrew S. Moffat, Amy J. Weinfurter, and Jason D. Schwartz. 2015. "Towards a New Climate Diplomacy." *Nature Climate Change* 5 (6): 501–503.

Lee, Taedong. 2015. "European Cities' Covenant for a Translocal Climate Network." *International Interactions* (this volume).

Majd, Megan, 2015. Analyzing the UN Climate Summit Commitments. <http://switchboard.nrdc.org/blogs/mmajd/smarts_analysis_of_un_climate_.html> (2015, July 28)

Morgenstern, Richard, and William Pizer, eds. 2007. *Reality Check: The Nature and Performance of Voluntary Environmental Programs in the United States, Europe, and Japan*. Washington, DC: RRF Press.

Pfeifer, Stephanie, and Rory Sullivan. 2008. "Public Policy, Institutional Investors and Climate Change: A UK Case-Study." *Climatic Change* **89**: 245-262.

Pinkse, Jonatan, and Ans Kolk,. 2009. *International Business and Global Climate Change.* Abingdon, UK: Routledge.

Potoski, Matthew, and Aseem Prakash. 2005. "Green Clubs and Voluntary Governance: ISO 14001 and Firms' Regulatory Compliance." *American Journal of Political Science* **49**(2): 235-248.

Potoski, Matthew, and Aseem Prakash. 2013. "Green Clubs: Collective Action and Voluntary Environmental Programs." *Annual Review of Political Science* **16**: 399-419.

Roger, Charles, Thomas Hale, and Liliana Andonova. 2015. "*Domestic Politics and Climate Governance*." *International Interactions* (this volume).

Stavins, Robert, Zou Ji et al. 2014. "International Cooperation: Agreements & Instruments." In *Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change:* 1001-1082. Cambridge, UK: Cambridge University Press.

Tetlock, Philip, and Aaron Belkin, eds. 1996. *Counterfactual Thought Experiments in World Politics: Logical, Methodological, and Psychological Perspectives*. Princeton, NJ: Princeton University Press.

UNEP. 2015. *Climate Commitments of Subnational Actors and Business: A Quantitative Assessment of their Emission Reduction Impact*. Nairobi.

UNFCCC. 2015. About the LPAA. <http://climateaction.unfccc.int/aboutlpaa.aspx> (2015, July 28).

United Nations. 2014a. Guidebook. Abu Dhabi Ascent in support of Climate Summit 2014. <http://www.un.org/climatechange/summit/wp-content/uploads/sites/2/2014/05/ASC_Brochure_13-May-2014_latest.pdf> (2015, July 28).

United Nations. 2014b. UN Climate Summit 2014. <http://www.un.org/climatechange/summit/> (2015, July 28).

United Nations. 2014c. FAQs. <http://www.un.org/climatechange/summit/faqs/> (2015, July 28).

United Nations. 2014d. *UN Secretary-General Announces New Initiatives and Partnerships to Mobilize Climate Finance and Promote Action in Cities, Forests, Farms and Industry*. Press Release, 23 September. New York.

World Bank. 2013. Database of Political Institutions 2012 <http://go.worldbank.org/2EAGGLRZ40> (2015, July 19). (update of Beck et al. 2001 from Jan. 2013).

World Resources Institute. 2015. CAIT Climate Data Explorer. <http://cait.wri.org/historical> (2015, July 18).

Young, Oran, ed. 1999. *The Effectiveness of International Environmental Regimes: Casual Connections and Behavioral Mechanisms*. Cambridge, MA: MIT Press.

Young, Oran. 2011. "Effectiveness of International Environmental Regimes: Existing Knowledge, Cutting-Edge Themes, and Research Strategies." *Proceedings of the National Academy of Sciences* **108**(50): 19853-19860.

Appendix

Table A1: Descriptive statistics, sources and explanations

Variable	Obs	Mean	Std. Dev.	Min	Max	Variable description	Sources
Quality1	109	0.96	1.10	0	4	Sum of individual quality indicators (Q_i)	Authors
Quality2	109	0.28	0.45	0	1	Dummy=1 if sum Q_i>=2	Authors
Quality3	109	0.15	0.36	0	1	Dummy=1 if sum Q_i>=3	Authors
Q_MitigationTarget	109	0.11	0.31	0	1	Definition of mitigation target	Authors
Q_Incentives	109	0.13	0.34	0	1	Introduction of related incentives	Authors
Q_Baseline	109	0.27	0.44	0	1	Specification and credibility of baseline	Authors
Q_MRV	109	0.46	0.50	0	1	Definition and use of MRV devices	Authors
Depends on gov.	109	0.15	0.36	0	1	Start depended on government action	Authors
Country Target	60	0.95	0.22	0	1	Mitigation target of the founding country (stringency inadequate=0, role model =3); missing for WB and INT	Ecofys et al. (2014)
Structure	109	2.33	0.93	1	3	Centralized=1, Coordinated=2, Decentralized=3	Authors
Adaptation focus	109	0.05	0.21	0	1	Initiative focusing primarily on adaptation	Authors
Entrepreneurial	109	0.33	0.47	0	1	Non-state actors played the leading role in initiating	Roger et al. (2015), updated by the authors
Transgovernmental	109	0.15	0.36	0	1	Only sub-state actors were responsible for creation	Roger et al. (2015), updated by the authors
NGO members	109	0.53	0.50	0	1	NGOs play a significant role in the initiative	Authors
Shaping	109	0.05	0.21	0	1	Orchestration: shaping function of government or international organization	Roger et al. (2015), updated by the authors
Kyoto operational	109	0.40	0.49	0	1	Dummy=1 if 2005<=year>=2009	
Post Copenhagen	109	0.31	0.47	0	1	Dummy=1 if year>2009	
GCF	58	21.56	4.26	14.97	47.58	Gross capital formation (% of GDP) in founding country; missing for EU, WB and INT	World Bank (2015)
Energy efficiency	58	8.58	2.91	4.01	17.32	GDP per unit of energy use (constant 2011 PPP $ per kg of oil equivalent) in founding country; missing for EU, WB and INT	World Bank (2015)
Emissions pc	58	15.14	6.78	1.63	29.79	Total greenhouse gas emissions including forestry (tCO2eq per capita) in founding country; missing for EU, WB and INT	World Resources Institute (2015)
Election year	58	0.41	0.50	0	1	Start year coincides with major legislative or presidential election in the founding country; missing for EU, WB and INT	Beck et al. (2001), updated by World Bank (2013) and by the authors
No of initiatives	109	8.82	5.63	1	18	Total number of initiatives started per year	Roger et al. (2015), updated by the authors
EU	109	0.02	0.13	0	1	Initiative founded by the EU	Authors
WB	109	0.12	0.33	0	1	Initiative founded by the World Bank	Authors
INT	109	0.33	0.47	0	1	Initiative founded by actors from different countries (international, no lead country)	Authors
year	109	2007	5.88	1990	2015	Starting year of the initiative	Roger et al. (2015), updated and adjusted by the authors

Notes: "Founding country" refers to the country in which the initiative was founded or in which the founding actor is located. However, the location of international organizations is not considered in this context (e.g., the United States does not count as a founding country for initiatives launched by the World Bank). The qualitative variable “founding country” contains separate categories for the World Bank, the EU and other international organizations (INT). Variables referring to founding countries have no observations for WB, EU and INT (at the exception of Country Target that is defined for the EU). Otherwise, data are complete as missing values were imputed by linear inter- or extrapolation. In all multivariate estimations, missing values of country-related variables for WB, EU and INT were replaced by 0 to avoid considerable loss of observations. This is why all estimations also include dummy variables for these three international actors.

When "Authors" is indicated as the data source, the data has been collected through a web search on the websites of the individual initiatives listed in the Roger et al. (2015) TCG dataset and additional initiatives added by the authors following the criteria in Roger et al. (2015).

Table A2: Correlates of TCG quality – examining complementarity with national policy

	(1) Quality1	(2) Quality2	(3) Quality3	(4) Q_MitigationTarget	(5) Q_Incentives	(6) Q_Baseline	(7) Q_MRV
Depends on gov.	1.66***	0.59***	0.79***	-0.05	0.65***	0.58***	0.47***
	(0.00)	(0.00)	(0.00)	(0.76)	(0.00)	(0.00)	(0.00)
Country Target	1.25**	0.38**	0.43**	0.24*	0.29**	0.37**	0.36
	(0.01)	(0.02)	(0.02)	(0.07)	(0.05)	(0.04)	(0.28)
Structure	-0.32***	-0.14**	-0.01	0.05	-0.04	-0.16**	-0.18***
	(0.00)	(0.02)	(0.73)	(0.13)	(0.47)	(0.04)	(0.00)
Adaptation focus	-0.81	-0.27	-0.28	-0.03	-0.15	-0.25	-0.37
	(0.22)	(0.24)	(0.11)	(0.61)	(0.48)	(0.20)	(0.14)
Entrepreneurial	-0.10	-0.06**	0.07*	0.03	-0.05	-0.06*	-0.00
	(0.32)	(0.02)	(0.07)	(0.30)	(0.22)	(0.08)	(0.96)
Target x Entrepr.	0.40	0.22*	-0.13	0.08	0.04	0.19	0.10
	(0.22)	(0.09)	(0.28)	(0.51)	(0.66)	(0.17)	(0.23)
Transgovernmental	0.45***	0.10**	0.20***	0.19***	-0.09**	0.11***	0.23***
	(0.00)	(0.01)	(0.00)	(0.00)	(0.02)	(0.01)	(0.00)
Target x Transg.	-0.79**	-0.16*	-0.25***	-0.28**	0.19*	-0.17*	-0.53**
	(0.02)	(0.08)	(0.00)	(0.02)	(0.05)	(0.09)	(0.02)
NGO members	0.28	0.04	0.19	0.07*	0.18***	0.07	-0.04
	(0.24)	(0.55)	(0.15)	(0.08)	(0.00)	(0.56)	(0.71)
Target x NGOs	-0.33	-0.02	-0.15	-0.11*	-0.14*	-0.08	-0.01
	(0.38)	(0.84)	(0.33)	(0.06)	(0.06)	(0.58)	(0.98)
GCF	-0.01	0.00	-0.01**	-0.01	-0.01	0.00	0.00
	(0.57)	(0.26)	(0.04)	(0.32)	(0.25)	(0.51)	(0.98)
Energy efficiency	-0.17***	-0.07***	-0.04**	-0.01	-0.01	-0.06***	-0.08***
	(0.00)	(0.00)	(0.01)	(0.51)	(0.52)	(0.00)	(0.00)
Emissions pc	-0.06**	-0.02**	-0.01**	0.01	-0.01	-0.02**	-0.04***
	(0.02)	(0.04)	(0.03)	(0.52)	(0.31)	(0.02)	(0.01)
Election year	-0.15	-0.05	0.07	-0.15	0.02	-0.01	-0.01
	(0.68)	(0.70)	(0.54)	(0.32)	(0.82)	(0.89)	(0.88)
No of initiatives	0.01	0.01	0.01**	-0.00	-0.00	0.01	0.00
	(0.60)	(0.17)	(0.03)	(0.62)	(0.98)	(0.21)	(0.64)
EU	-1.19	-0.41	-0.31	0.75***	-0.45*	-0.44	-1.04*
	(0.17)	(0.16)	(0.24)	(0.01)	(0.09)	(0.13)	(0.05)
WB	-2.03**	-0.54*	-0.62**	-0.05	-0.05	-0.69**	-1.24
	(0.05)	(0.07)	(0.03)	(0.90)	(0.87)	(0.04)	(0.10)
INT	-1.85*	-0.52*	-0.51*	-0.16	0.01	-0.58**	-1.12
	(0.06)	(0.06)	(0.07)	(0.63)	(0.98)	(0.04)	(0.12)
Year	-0.02	-0.00	-0.00	0.00	-0.01	-0.00	-0.01
	(0.50)	(0.78)	(0.65)	(0.84)	(0.17)	(0.95)	(0.22)
Constant	35.13	7.14	8.04	-4.53	12.41	2.22	25.02
	(0.46)	(0.75)	(0.64)	(0.84)	(0.16)	(0.92)	(0.18)
Adj. R2	0.48	0.41	0.46	0.16	0.48	0.37	0.36
N	109	109	109	109	109	109	109

Note: Linear regression models with p-values in parentheses based on robust standard errors (heteroscedasticity consistent and clustered by founding country); ***, ** and * indicate significance at the 1%-, 5%- and 10%-level respectively.

Table A3: Correlates of TCG quality – examining complementarity with international policy

	(1) Quality1	(2) Quality2	(3) Quality3	(4) Q_MitigationTarget	(5) Q_Incentives	(6) Q_Baseline	(7) Q_MRV
Depends on gov.	1.59***	0.56***	0.71***	-0.02	0.60***	0.52***	0.49***
	(0.00)	(0.00)	(0.00)	(0.85)	(0.00)	(0.00)	(0.00)
Country Target	1.18***	0.41**	0.35**	0.20	0.24*	0.39***	0.35
	(0.01)	(0.02)	(0.02)	(0.25)	(0.06)	(0.01)	(0.22)
Structure	-0.23	-0.11	-0.03	0.08**	-0.02	-0.13	-0.16**
	(0.17)	(0.16)	(0.70)	(0.03)	(0.74)	(0.18)	(0.03)
Adaptation focus	-0.65	-0.22	-0.24*	0.02	-0.15	-0.21	-0.31
	(0.23)	(0.29)	(0.08)	(0.62)	(0.46)	(0.16)	(0.16)
Kyoto operational	-0.26	0.00	-0.20	-0.14	-0.05	-0.18	0.11
	(0.65)	(0.99)	(0.27)	(0.45)	(0.74)	(0.66)	(0.66)
Post Copenhagen	0.21	0.13	-0.01	-0.07	0.00	0.02	0.26
	(0.75)	(0.71)	(0.96)	(0.77)	(0.99)	(0.96)	(0.54)
Entrepreneurial	0.09	0.08	-0.12	0.08	-0.11	-0.06	0.18
	(0.77)	(0.66)	(0.30)	(0.50)	(0.31)	(0.81)	(0.23)
Kyoto x Entrepr.	0.76	0.22	0.14	0.18*	0.08	0.36	0.14
	(0.12)	(0.27)	(0.37)	(0.07)	(0.64)	(0.17)	(0.71)
Copenh. x Entrepr.	-0.41	-0.10	0.10	-0.21	0.11	0.04	-0.35
	(0.11)	(0.58)	(0.35)	(0.17)	(0.18)	(0.86)	(0.10)
Transgovernmental	-0.92	-0.21	-0.32	-0.15	-0.03	-0.29	-0.45
	(0.13)	(0.45)	(0.27)	(0.48)	(0.83)	(0.33)	(0.17)
Kyoto x Transg.	1.24	0.34	0.59	0.12	0.20	0.50	0.42
	(0.16)	(0.34)	(0.13)	(0.57)	(0.36)	(0.25)	(0.31)
Copenh. x Transg.	1.43**	0.31	0.45*	0.44*	0.01	0.37	0.62*
	(0.02)	(0.24)	(0.07)	(0.07)	(0.97)	(0.16)	(0.06)
NGO members	0.23	0.17	0.04	-0.02	0.17	0.06	0.02
	(0.64)	(0.38)	(0.85)	(0.91)	(0.19)	(0.80)	(0.90)
Kyoto x NGOs	-0.17	-0.20	0.10	0.07	-0.02	-0.05	-0.17
	(0.72)	(0.46)	(0.62)	(0.76)	(0.83)	(0.88)	(0.21)
Copenh. x NGOs	-0.36	-0.20	-0.01	-0.05	-0.17	-0.11	-0.03
	(0.50)	(0.40)	(0.96)	(0.73)	(0.22)	(0.69)	(0.91)
GCF	0.02	0.01*	-0.01	0.00	-0.01	0.01	0.02
	(0.26)	(0.06)	(0.35)	(0.82)	(0.26)	(0.13)	(0.33)
Energy efficiency	-0.13***	-0.06***	-0.03***	-0.00	-0.01	-0.05***	-0.06**
	(0.00)	(0.00)	(0.00)	(0.92)	(0.23)	(0.00)	(0.03)
Emissions pc	-0.05**	-0.02**	-0.01**	0.01	-0.01	-0.02*	-0.03**
	(0.02)	(0.05)	(0.02)	(0.49)	(0.14)	(0.08)	(0.02)
Election year	-0.13	-0.04	0.11	-0.17	0.01	0.00	0.03
	(0.73)	(0.77)	(0.40)	(0.34)	(0.94)	(1.00)	(0.69)
No of initiatives	0.02	0.01**	0.01**	-0.00	0.00	0.01*	0.01*
	(0.18)	(0.04)	(0.02)	(0.92)	(0.99)	(0.06)	(0.09)
EU	-0.19	-0.14	-0.11	1.04***	-0.53*	-0.14	-0.56
	(0.80)	(0.56)	(0.55)	(0.00)	(0.09)	(0.63)	(0.40)
WB	-0.74	-0.15	-0.34	0.25	-0.18	-0.24	-0.57
	(0.38)	(0.65)	(0.17)	(0.59)	(0.64)	(0.56)	(0.49)
INT	-0.59	-0.17	-0.22	0.17	-0.18	-0.17	-0.42
	(0.49)	(0.57)	(0.36)	(0.69)	(0.62)	(0.64)	(0.60)
Year	-0.05	-0.01	-0.01	-0.00	-0.00	-0.01	-0.04
	(0.21)	(0.45)	(0.41)	(0.96)	(0.86)	(0.62)	(0.16)
Constant	102.71	26.97	26.35	2.03	2.51	19.63	78.53
	(0.20)	(0.44)	(0.40)	(0.96)	(0.84)	(0.60)	(0.15)
Adj. R2	0.49	0.40	0.46	0.17	0.45	0.37	0.35
N	109	109	109	109	109	109	109

Note: Linear regression models with p-values in parentheses based on robust standard errors (heteroscedasticity consistent and clustered by founding country); ***, ** and * indicate significance at the 1%-, 5%- and 10%-level respectively.

Table A4: Correlates of TCG quality – examining leadership roles in conjunction with international policy

	(1) Quality1	(2) Quality2	(3) Quality3	(4) Q_MitigationTarget	(5) Q_Incentives	(6) Q_Baseline	(7) Q_MRV
Depends on gov.	1.19***	0.40***	0.75***	-0.12	0.60***	0.41***	0.30***
	(0.00)	(0.00)	(0.00)	(0.30)	(0.00)	(0.00)	(0.01)
Country Target	1.07**	0.38***	0.32**	0.22*	0.22	0.32***	0.32
	(0.01)	(0.00)	(0.04)	(0.10)	(0.10)	(0.00)	(0.23)
Structure	-0.42***	-0.18***	-0.03	0.02	-0.02	-0.19***	-0.22***
	(0.00)	(0.00)	(0.39)	(0.34)	(0.63)	(0.00)	(0.00)
Adaptation focus	-0.82	-0.29	-0.20*	-0.08	-0.16	-0.21**	-0.37*
	(0.12)	(0.15)	(0.08)	(0.14)	(0.50)	(0.04)	(0.06)
Kyoto operational	0.15	0.04	0.01	-0.06	0.02	0.09	0.11
	(0.75)	(0.82)	(0.96)	(0.34)	(0.83)	(0.59)	(0.73)
Post Copenhagen	0.16	0.06	0.07	-0.07	-0.03	0.10	0.16
	(0.79)	(0.81)	(0.73)	(0.68)	(0.82)	(0.64)	(0.74)
Shaping	0.11	0.03	0.21	-0.20**	0.38***	0.09	-0.16
	(0.80)	(0.86)	(0.32)	(0.03)	(0.00)	(0.53)	(0.50)
Kyoto x Shaping	-0.73	-0.08	-0.31	0.16	-0.45***	-0.15	-0.29
	(0.32)	(0.73)	(0.27)	(0.11)	(0.01)	(0.52)	(0.42)
Copenh. x Shaping	1.77***	1.05***	-0.19	0.15*	-0.42***	0.99***	1.04***
	(0.00)	(0.00)	(0.37)	(0.09)	(0.00)	(0.00)	(0.00)
Kyoto x WB	-1.20***	-0.47***	-0.44***	0.11**	-0.06	-0.88***	-0.37*
	(0.00)	(0.00)	(0.00)	(0.03)	(0.21)	(0.00)	(0.09)
Copenh. x WB	-0.75**	-0.41***	-0.07	0.01	-0.01	-0.44***	-0.31
	(0.02)	(0.00)	(0.58)	(0.93)	(0.92)	(0.00)	(0.17)
GCF	-0.00	0.00	-0.01	-0.01	-0.01*	0.00	0.01
	(0.97)	(0.41)	(0.28)	(0.43)	(0.05)	(0.73)	(0.28)
Energy efficiency	-0.18***	-0.07***	-0.04***	-0.01	-0.02	-0.07***	-0.08***
	(0.00)	(0.00)	(0.00)	(0.65)	(0.13)	(0.00)	(0.01)
Emissions pc	-0.06**	-0.02*	-0.01**	0.01	-0.01*	-0.02**	-0.04***
	(0.02)	(0.07)	(0.01)	(0.38)	(0.06)	(0.02)	(0.01)
Election year	-0.12	-0.05	0.11	-0.16	0.04	-0.02	0.01
	(0.80)	(0.73)	(0.44)	(0.35)	(0.76)	(0.90)	(0.91)
No of initiatives	0.02	0.02***	0.01**	-0.00	0.00	0.02***	0.01
	(0.14)	(0.01)	(0.04)	(0.68)	(0.99)	(0.01)	(0.14)
EU	-1.65**	-0.57*	-0.31	0.66**	-0.49**	-0.64**	-1.19**
	(0.04)	(0.06)	(0.17)	(0.04)	(0.03)	(0.03)	(0.03)
WB	-1.18	-0.16	-0.45	-0.03	-0.13	-0.29	-0.73
	(0.18)	(0.56)	(0.18)	(0.94)	(0.46)	(0.32)	(0.32)
INT	-1.90**	-0.58**	-0.44	-0.10	-0.17	-0.71***	-0.91
	(0.05)	(0.03)	(0.11)	(0.77)	(0.41)	(0.01)	(0.19)
Year	-0.04	-0.01	-0.01	0.00	-0.00	-0.01	-0.03
	(0.44)	(0.56)	(0.62)	(0.82)	(0.92)	(0.54)	(0.43)
Constant	73.57	21.56	17.38	-8.41	1.80	23.71	56.47
	(0.42)	(0.54)	(0.61)	(0.82)	(0.90)	(0.52)	(0.42)
Adj. R2	0.50	0.46	0.45	0.11	0.44	0.47	0.38
N	109	109	109	109	109	109	109

Note: Linear regression models with p-values in parentheses based on robust standard errors (heteroscedasticity consistent and clustered by founding country); ***, ** and * indicate significance at the 1%-, 5%- and 10%-level respectively.