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***The trade and environment relationships reconsidered:
The case of regional trade and regional trade agreements***

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Abstract

Background and objective

The debates over the consequences of trade liberalisation on the environment have been steadily growing throughout the 1990s, crystallising over the identification of economic channels whereby trade effects passed on to the environment. Outstanding academic researches have provided clear-cut insights on the hypothesis upon which trade liberalisation effects on the environment could turn positive or negative. What has emerged from this body of literature is that no systematic effect could be predictable, and that the environmental impacts of trade eventually remained an empirical question.

In spite of this consensual finding, the trade and environment debate has regained momentum over the last couple of years. Trade issues have taken up the lead in climate change debates. In Europe, propositions to tax imports from non-signer of Kyoto pact have been discussed extensively within the European Commission, with contrasted arguments and mixed support. Contributions on food miles, and on the potential benefits, in carbon emission abatement terms, of short distance trade are flourishing. More broadly, WTO talks stuck in the sand, and the skyrocketing number of regional trade agreements (RTAs) with heterogeneous environmental contents altogether question the longstanding validity of the empirical evidence on the trade and environment relationships established with 1980s and early 1990s data almost exclusively.

Against this background, the question we aim to address is to what extent regional trade and RTAs modify the way we used to think about the trade and environment relationships, with a particular emphasis on carbon emission. Our main finding is that RTAs seem to present more challenges than opportunities in harnessing trade for sustainable development. Regional trade agreements, which are often presented as second best choice for developing countries, would hence turn out second best choice for the environment as well.

The trade and environment relationship in a multilateral framework

In the multilateral trade framework, three channels through which trade is likely to have an impact on the environment are identified in the literature.

The first is the level or scale of economic activity. All else equal, and in particular the available technology and its distribution across sectors, the scale effect necessarily lowers environmental quality. The second channel is the change in economic activity caused by trade. Some countries may specialise in dirty productions and exports because of comparative advantages in those sectors. A change in the composition of their output can hence raise pollution, all else equal. Conversely, comparative advantages can lead a country to specialise in clean goods. In such a case the composition effect turns out to be positive. Contrary to the scale effect, no systematic sign is attached to the environmental consequences of liberalised trade in the composition of output. Last, changes in environmental regulation induced by income growth and higher environmental concerns in public opinion and among tax payers are assumed to lower the dirtiness of production techniques for a so-called technique effect.

In the most widely cited analysis - the case of sulfur dioxide concentration in over 100 major cities in the world – the above framework delineating scale, composition and technique

effects of trade was confronted with empirical data. Combining estimates of scale, composition and technique effects created by trade liberalisation yield to the conclusion - in the case of SO₂ at least -, that freer trade is good for the environment.

The trade and environment relationship in a regional framework

Our literature review shows that the trade and environment linkages have not been conceptualized specifically in the case of regional trade and have been almost exclusively explored at the regional level from an institutional perspective. The question as to whether potential changes in the multilateral trade and environment relationships described above could arise from regional trade and regional trade agreements is hence left open. We define four hypothetical types of RTAs, and derive for each a first set of implications on the trade and environment relationship at regional level, in comparison with the multilateral framework.

North-South RTAs with poor South countries

The RTA the most similar in its predictable effects on the environment would be a North-South RTA with a rich, capital intensive country trading with labour intensive developing countries. This is the case for instance of EU Economic Partnership Agreements or US Cafta. Discrepancy in factor endowments is expected to bolster trade and shift capital (dirty) goods production from labour-abundant South to capital-abundant North where regulations are more stringent. As in the multilateral case, the competition from developed country exports of pollution intensive goods should hinder developing countries specialisation in pollution intensive goods, for an overall positive environmental impact.

North-South Trade RTAs with emerging South countries

North-South RTAs including at least one emerging country could modify this straightforward analogy with freer multilateral trade. Assuming that emerging countries specialise in labour intensive goods may turns out erroneous in this case indeed. The composition of emerging countries' export such as China shows that their export basket is significantly more sophisticated than what would be normally expected for a country at a comparable level of income. Consequently, no predictable composition effect such as those occurring in the labour-intensive scenario can be associated with China's exports at this stage – and very likely, to any RTA involving an emerging country - on the basis of its current export mix.

South rich – South poor RTAs

An even less straightforward case can be found in RTAs involving a rich developing country and low income economies, such as the Afta-China, Southern Africa Development Community (SADC), or Mercosur trade agreements. Around 70 percent of tariffs faced by developing countries are levied by other developing countries. The reduction of such tariffs thanks to South-South RTAs should in all likelihood foster trade and magnify the negative scale effect. To what extent the policy response in rich developing countries is income elastic so that environmental regulation would be tight enough to create a beneficial technique effect is an open question. Last, the pressure for tighter environmental regulation in countries such as China, conveyed by rich countries' public opinion, Ngo's, governments and even firms, could be much lower in the case of South-South RTAs, enabling policy makers to postpone the policy reforms needed to tackle the environmental damages associated with freer trade.

South poor – South poor RTAs

Then come RTAs among poor countries with relatively homogenous factor endowments such as the Regional African unions, integrating labour abundant countries with a budding

manufacturing sector. The international economics framework of analysis does not help much in this case. Manufacture is not to the most prominent source of pollution, when compared with natural resource extraction industries. A particular aspect of the pollution from natural resource industries lies in the difficulty, and costs, to establish and maintain property rights, and to control the extraction. Resource abundant countries have both weak regulation and a cost advantage in these industries. The composition effect may hence be potentially damaging. This distinction actually applies for the four types of RTAs and maybe more prominently in the case of RTAs with a core emerging country tapping the natural resources of the poor countries at the periphery (South rich – South poor RTAs above).

These four types of RTAs provide as a first guess a rather negative picture of the trade and environment relationship at regional level. Such a relationship could be left unchanged in the case of North-South RTAs when compared with the multilateral case, should we set aside emerging countries as part of the South. But in all other cases, some possible negative effects, or uncertain effects at best, seem more likely to be either triggered or reinforced. High South-South tariff level means a potentially huge scale effect. A shift toward natural resources exports in the poor South and a shift toward capital intensive goods in the rich South (either toward North or South) could make the composition effect turn negative. Last, collective preferences for development and growth more than for the environment per se, in addition to non-systematic policy responses toward greener policy may altogether dampen, not to say cancel, the positive technique effects underscored in the multilateral case.

Refining the framework with regional transport, value chains and institutions

All the tentative estimates above suggest that the RTA-partner country one particular country is trading with indeed matters when dealing with the environmental consequences of trade. We have also taken into account some complementary drivers for change in the trade and environment relationship at regional level, namely values chains motives for specialisation, transport environmental costs, and heterogeneous institutional responses to environmental damages at regional level. These were not – or not fully - taken into account in the multilateral framework.

The Geography of Value Chains

The specific issue of the amount of carbon embedded in air exports from long distance supplying countries, and particularly remote developing countries, have received considerable attention within the so called ‘food miles’ debate. RTAs have the potential to both reduce the embedded carbon content of exports by shortening distances, and to provide the appropriate policy framework for a closer cooperation between a restricted number of countries at a time when multilateral talks, with the Doha round in sands and the post 2012 climate change agenda still in limbo, seem arduous to finalise. By lowering environmental transport costs and enhancing environmental cooperation, RTAs could hence have the potential to counterweight the likely negative scale, composition and technique effects derived from the restrictive application of the multilateral framework of analysis we have started our study with. What indeed matters is the geographical repartition of value chains components, and in particular, the location of its most pollutant segments. As long as such a geography cannot be predicted, the effect of RTAs on the environment remains an empirical question.

Transport

Projections foresee a GHG emission growth from maritime transport of 35–45 % in absolute levels between 2001 and 2020, based on expectations of continued growth in world trade and

providing that no actions are taken to limit emissions per ton-kilometre. This remains below air freight and inland transport projections (European Environment Agency, 2008). Further, the complete lack of environmental regulation – pertaining specifically to energy efficiency – in international maritime transport leaves room to make seaborne transport even more energy efficient and the ‘less bad mode’ of transport well ahead of air freight and road vehicles on a ton kilometre basis (International Energy Agency, 2007).

Counter-intuitively, regional trade could also lead to an increase in transport-induced GHG emissions as soon as road freight transport substitutes to long distance maritime transport. Inland freight transport (road, rail and inland waterways) in the European economic area (EEA) member countries indeed increased by 30 % (2.7 % per annum), with the road freight segment witnessing the greatest percentage increase (38 %). In China, the International Energy Agency estimates that transport-sector oil use would increase from 115 MT per annum in 2005 to 442 MT in 2030, roughly the same as the EU at that time (International Energy Agency, 2007). This is a 5% annual increase, double the expected demand growth for energy as a whole. Currently, the transport sector accounts for a relatively small share of China’s total oil demand (33%), compared with the global average of 50%. Although such domestic growth cannot be systematically associated with trade, it underlines how restrictive is the hypothesis of a reduction in long distance freight transport ‘all else equal’.

Institutions

So far only few trade agreements between developing countries or emerging economies include references to the environment. It would be wrong to assume that including environmental considerations in trade agreements has become generally accepted or can even be taken for granted. On the contrary, negotiators have pointed out that it remains a challenge, first to convince their partners to accept the principle of including environmental issues at all in an RTA, and then, to negotiate the details.

Further, while RTAs have contributed to better integration of trade and environment at bilateral and regional levels, this progress is not yet visible in the multilateral arena. Last, with the current proliferation of RTAs, and the variety of environmental arrangements, some countries face a web of different levels of environmental commitments the increasingly complex problem of managing various levels of environmental commitments and different types of environmental co-operation programmes under a range of RTAs.

Globally, no clear-cut empirical evidence emerges on the effective commitment of developing countries toward enhancing environmental inclusion in RTAs. This said, the wide range of policy options and cooperation mechanism at disposal, along with the limited number of players, would seem to leave wider room for institutional innovation, targeting and flexibility in the making of accompanying policies when compared to the multilateral framework. Stubborn political willingness to use this policy space from an environmental and development perspective would there be needed, so as to mitigate the likely negative scale, composition and technique effects possibly arising from RTAs. Current approach of environmental issues within RTAs makes such a willingness more words than facts. Regional trade agreements, which are often presented as second best choice for developing countries, would hence turn out second best choice for the environment as well.

1. Introduction

The debates over the consequences of trade liberalisation on the environment have been steadily growing throughout the 1990s, crystallising over the identification of economic channels whereby trade effects passed on to the environment, and over the appropriate institutional vehicles to harness sustainable trade. Outstanding academic research has provided clear-cut insights on the hypothesis upon which trade liberalisation effects on the environment could turn positive or negative. What has emerged from this body of literature is that no systematic effect could be predictable, and that the environmental impacts of trade eventually remained an empirical question.

In spite of this consensual finding, the trade and environment debate has regained momentum over the last couple of years. Trade issues have taken up the lead in climate change debates. In Europe, propositions to tax imports from non-signer of Kyoto pact have been discussed extensively within the European Commission, with contrasted arguments and mixed support. Contributions on food miles, and on the potential benefits, in carbon emission abatement terms, of short distance trade are flourishing. More broadly, WTO talks stuck in the sand, and the skyrocketing number of regional trade agreements (RTAs) with heterogeneous environmental contents altogether question the longstanding validity of the empirical evidence on the trade and environment relationships established with 1980s and early 1990s data almost exclusively.

The question we aim to address is to what extent regional trade and RTAs modify the way we used to think about the trade and environment relationships, with a particular emphasis on carbon emission.

We provide in section 2 a description of the analytical framework formalised in the early 2000s by international trade economists on the basis of researches developed throughout the 1980s and 1990s. In this section, we wrap up the determining factors of environmental impacts which were then identified, as well as the main empirical evidence collected. Possible implications of this reference framework for four types of regional trade agreements (RTAs) are explored in section 3. In section 4 we extend our analysis to issues neglected or ignored in the reference framework which are transport pollution, the geography of value chains and institutions. The potential use of RTAs as a lever for global environmental agreements is the object of the last section. Our conclusion is that RTAs seem to present more challenges than opportunities in harnessing trade for sustainable development. Regional trade agreements, which are often presented as second best choice for developing countries, would hence turn out second best choice for the environment as well

2. The trade and environment relationships in a multilateral framework

The harsh debate between environmentalists and the trade policy community fuelled by NAFTA and GATT negotiations in the 1990s used to crystallise onto two antagonist positions¹. On the one hand, many from the ‘deep green’ environmental movement asserted that unfettered access to world markets was necessarily harmful to the environment because of trade-induced greater scale of economic activity. On the other hand, international trade

¹ See *Esty (1994) and Bhagwati (2004)*

economists underlined the positive environmental effect international trade could have thanks to income growth and higher willingness to pay for environmental protection, worrying in the same time that protectionism in the guise of environmental policy could obstruct efforts to open markets and integrate economies around the world². Both views quickly appeared to be too simplistic. Other factors than trade generate growth, and particularly so innovation and capital accumulation. Trade hence should not be blamed for all the environmental damages generated by output growth.

In a further attempt to disentangle the complex links between trade and the environment, economists have developed and refined a conceptual framework liable to reconcile, or at least to make dialogue, ‘deep greens’ and ‘free traders’³. In this framework, three channels through which trade is likely to have an impact on the environment are identified⁴. The first is the level or *scale* of economic activity. All else equal, and in particular the available technology and its distribution across sectors, the scale effect necessarily lowers environmental quality. The second channel is the change in economic activity caused by trade. Some countries may specialise in dirty productions and exports because of comparative advantages in those sectors. A change in the *composition* of their output can hence raise pollution, all else equal. Conversely, comparative advantages can lead a country to specialise in clean goods. In such a case the composition effect turns out to be positive. Contrary to the scale effect, no systematic sign is attached to the environmental consequences of liberalised trade in the composition of output. Last, changes in environmental regulation induced by income growth and higher environmental concerns in public opinion and among tax payers are assumed to lower the dirtiness of production techniques for a so-called *technique* effect.

The ‘all else equal’ condition being invalidated in real world economics where the three effects occur in the same time, the uncertainty over the full environmental impact of trade has left many debates unresolved. In particular, the ‘race to the bottom’ or ‘pollution haven’ hypothesis, according to which dirty industries would leave tightly regulated countries and migrate to countries with lax regulations, found neither confirmation nor invalidation within the theoretical framework described above. Indeed, if developed and less developed countries differ in the stringency of their environmental regulations, they also differ widely in education levels, infrastructure and capital endowments which all are determinants of production costs and ultimately of trade flows. The source of cost advantage does not lie in lax regulation alone. The root causes of comparative advantages matter. The full environmental impact of trade liberalisation can only be resolved through careful empirical investigation (Copeland and Taylor, 2003).

In the most widely cited analysis - the case of sulfur dioxide concentration in over 100 major cities in the world – the above framework delineating scale, composition and technique effects of trade was confronted with empirical data⁵. Trade liberalisation is defined as a gradual reduction in trade frictions (trade barriers, communication and logistical costs, shipment costs) that move domestic prices closer to world prices. The separation is further made between the impact of economic growth on the environment, modelled in either changes in technologies or endowments, from that caused by trade liberalisation alone. We summarise

² On economic integration and environmental protection, see in particular Esty (2005)

³ This body of research culminated with the reference book of Copeland and Taylor (2003)

⁴ The terms *scale*, *composition* and *technique* effects were introduced by Grossman and Krueger (1993) in their study of NAFTA

⁵ Antweiler, Copeland and Taylor (2001), with extension and comments in Copeland and Taylor (2003)

below the main findings of this influential study as well as of converging research results, from general down to specific⁶.

Finding 1: While trade liberalisation creates environmental impacts of no systematic sign across countries, capital accumulation favours the production of capital-intensive dirty goods, and hence creates an additional negative scale effect.

Finding 2: While economic growth fuelled by capital accumulation is likely to raise pollution levels, growth fuelled by technological progress will lower it.

Finding 3: The relative strength of scale versus technique effects depends on how government policy is formed and how quickly it changes in response to new conditions.

Finding 4: Even in a world where policy is flexible and responsive to trade-created income gains, the impact of freer trade still depends on the sources of a country's comparative advantages.

Finding 5: Among the potential sources of comparative advantages, conventional determinants of production costs – and particularly factor endowments- are empirically more important than are differences in environmental regulations. In short, human and physical capital as well as technology endowments in developed economies seem to more than outweigh developing countries' advantage stemming from less stringent regulation⁷.

Finding 6: Empirical evidence suggests that relative rich developed countries have a comparative advantage in capital-intensive goods, and hence in dirty goods (labour intensive goods are assumed to be 'cleaner' than capital intensive ones). Freer trade shifts capital (dirty) goods production from labour well-endowed South to capital well-endowed North, meaning from lax-regulation countries to more stringent-regulation countries. Provided that such a result can be generalized to non SO₂ cases, global composition effect would hence lower pollution overall.

Finding 7: Combining estimates of scale, composition and technique effects created by trade liberalisation yield to the conclusion - in the case of SO₂ at least -, that freer trade is good for the environment.

All the above findings are not specific either to bilateral or multilateral trade. Still, cross-country econometric analysis upon which they are based basically takes into account different levels of pollution, trade openness and regulation across the widest range of countries. This makes such a framework identifiable with multilateral trade.

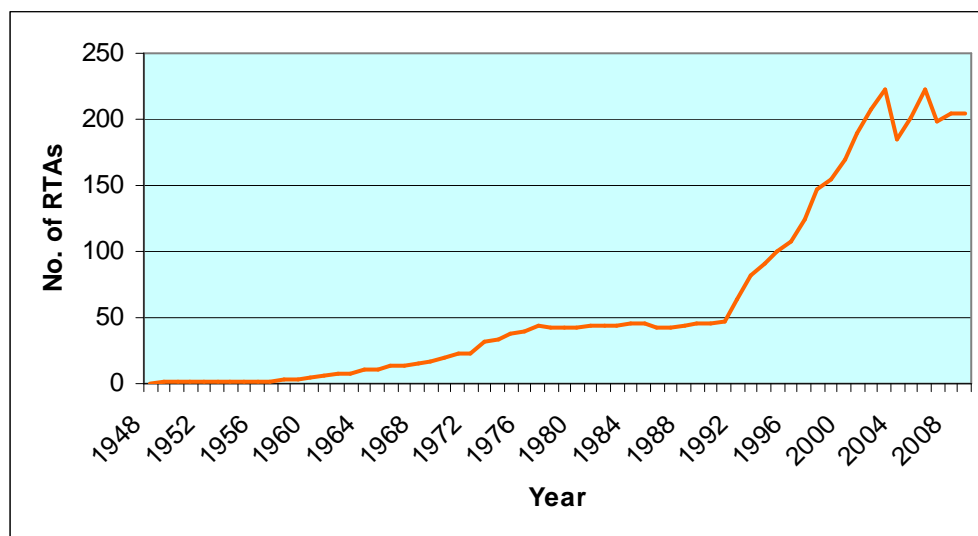
⁶ See Copeland and Taylor (2004) for a review of quantitative assessments. It may be worth noticing that the Trade Sustainable Impact Assessments (Trade SIAs) carried out by the European Commission since 1999 prior to any trade liberalisation negotiation are not mentioned in this paper. This omission may be explained by the fact that most Trade SIAs use second hand CGE model simulations from which they derive a systematic negative scale impact, with additional qualitative analysis of potential additional impacts. See for instance in the case of agricultural trade liberalisation Stockholm Environmental Institute (2004)

⁷ The largest producers of dirty pollution intensive goods remain OECD countries due to comparative advantages in capital intensive goods. In the case of CO₂ emissions, and in spite of climate change mitigation policies such as the EU emission trading scheme, the EU and US export mixes contain a higher percentage of high carbon-intensity goods than the export mixes of China and developing countries (Delgado, 2007). And carbon emitting industry leakages toward countries not constrained by the Kyoto Protocol, though an obvious and potential threat for the global efficiency of the EU-ETS, has still to be empirically assessed.

3. The trade and environment relationships in a regional framework

Regionalism is described in the Dictionary of Trade Policy Terms, as ‘actions by governments to liberalize or facilitate trade on a regional basis, sometimes through free-trade areas or customs unions’. In the WTO context, regional trade agreements (RTAs) may be agreements concluded between countries not necessarily belonging to the same geographical region⁸. Some 380 RTAs have been notified to the GATT/WTO up to July 2007 (figure 1). Of these, 300 RTAs were notified under Article XXIV of the GATT 1947 or GATT 1994; 22 under the Enabling Clause; and 58 under Article V of the GATS. At that same date, 205 agreements were in force. When taking into account RTAs which are in force but have not been notified, those signed but not yet in force, those currently being negotiated, and those in the proposal stage, we arrive at a figure of close to 400 RTAs which are scheduled to be implemented by 2010. Of these RTAs, free trade agreements (FTAs) and partial scope agreements account for over 90%, while customs unions account for less than 10 %⁹.

Figure 1. Regional Trade Agreements notified to the GATT/WTO by date of entry into force



Source: WTO

Our literature review shows that the trade and environment linkages have not been conceptualized specifically in the case of regional trade and have been almost exclusively explored at the regional level from an institutional perspective¹⁰. A notable exception can be found in Ghosh and Yamarik (2007) whose modelling combines and connects RTAs, trade, growth, and the environment, and tests for the trade-induced economic growth and Kuznets curve hypothesis. Still their model remains empirical and does not explore regional-trade specific channels of environmental impacts. The question as to whether potential changes in the ‘Copeland and Taylor’ trade and environment relationships described above could arise from regional trade and regional trade agreements is hence left open.

To start to answer it, at least intuitively, let’s recall first that in the Copeland-Taylor international economics framework of analysis, comparative advantages based on factor

⁸ See the WTO website, http://www.wto.org/english/tratop_e/region_e/scope_rta_e.htm

⁹ See also WTO website, http://www.wto.org/english/tratop_e/region_e/region_e.htm

¹⁰ For a review of institutional patterns of environmental regulations in RTA see OECD (2007)

endowment were key determinants of trade flows in ‘dirty’ and ‘clean’ goods, and of the overall net environmental impact of trade. Restricting to industrial pollution, assuming that capital intensive goods are ‘dirtier’ than labour intensive goods as they do, we can define four hypothetical cases of RTAs, and derive for each a first set of implications on the trade and environment relationship at regional level.

3.1. North-South RTAs with poor South countries

The RTA the most similar in its predictable effects on the environment would be a North-South RTA with a rich, capital intensive country trading with labour intensive developing countries. This is the case for instance of EU Economic Partnership Agreements or US Cafta. Discrepancy in factor endowments is expected to bolster trade and shift capital (dirty) goods production from labour-abundant South to capital-abundant North where regulations are more stringent. As in the multilateral case, the competition from developed country exports of pollution intensive goods should hinder developing countries specialisation in pollution intensive goods, for an overall positive environmental impact.

3.2. North-South Trade RTAs with emerging South countries

North-South RTAs including at least one emerging country could modify this straightforward analogy with freer multilateral trade. Assuming that emerging countries specialise in labour intensive goods may turn out erroneous in this case indeed. The composition of emerging countries’ export such as China shows that their export basket is significantly more sophisticated than what would be normally expected for a country at a comparable level of income (Rodrik, 2006). Consequently, no predictable composition effect such as those occurring in the labour-intensive scenario can be associated with China’s exports at this stage – and very likely, to any RTA involving an emerging country - on the basis of its current export mix.

3.3. South rich – South poor RTAs

An even less straightforward case can be found in RTAs involving a rich developing country and low income economies, such as the Afta-China, Southern Africa Development Community (SADC), or Mercosur trade agreements. Around 70 percent of tariffs faced by developing countries are levied by other developing countries. First, the reduction of such tariffs thanks to South-South RTAs should in all likelihood foster trade and magnify the negative scale effect – this is indeed one of the core factual arguments supporting the trade-creation hypothesis of RTAs, when compared with the ‘trade diversion’ alternative hypothesis which has received so far much less empirical support. Second, if factor endowment remains a key driver of trade between, in this case, capital abundant emerging countries and labour abundant low income countries, then the shift in dirty good production from the poor to richer developing countries may be less systematically accompanied by tighter regulation as in the multilateral scenario. Because policy response in relatively rich countries is quite income elastic, it was deemed possible in the multilateral freer trade case that pollution would fall in both the developed and the developing world. To what extent the policy response in rich developing countries is also income elastic so that environmental regulation would be tight enough to create a beneficial technique effect is an open question. The discrepancy between Beijing official targets set to protect the environment and the poor level of implementation by local officials who generally ignore them, preferring to concentrate on further advancing economic growth has been repeatedly emphasised over recent years (Economy, 2007). Further, the pressure for tighter environmental regulation in countries such as China, conveyed by rich countries’ public opinion, Ngo’s, governments and even firms, could be

much lower in the case of South-South RTAs, enabling policy makers to postpone the policy reforms needed to tackle the environmental damages associated with freer trade.

3.4. South poor – South poor RTAs

Then come RTAs among poor countries with relatively homogenous factor endowments such as the Regional African unions, integrating labour abundant countries with a budding manufacturing sector. The international economics framework of analysis does not help much in this case. Manufacture is not to the most prominent source of pollution, when compared with natural resource extraction industries. A particular aspect of the pollution from natural resource industries lies in the difficulty, and costs, to establish and maintain property rights, and to control the extraction. As stressed by Taylor (2004), resource abundant countries have both weak regulation and a cost advantage in these industries. The composition effect may hence be potentially damaging. This distinction actually applies for the four types of RTAs and maybe more prominently in the case of RTAs with a core emerging country tapping the natural resources of the poor countries at the periphery (South rich – South poor RTAs above).

These four types of RTAs provide as a first guess a rather negative picture of the trade and environment relationship at regional level. Such a relationship could be left unchanged in the case of North-South RTAs when compared with the multilateral case, should we set aside emerging countries as part of the South. But in all other cases, some possible negative effects, or uncertain effects at best, seem more likely to be either triggered or reinforced. High South-South tariff level means a potentially huge scale effect. A shift toward natural resources exports in the poor South and a shift toward capital intensive goods in the rich South (either toward North or South) could make the composition effect turn negative. Last, collective preferences for development and growth more than for the environment per se, in addition to non-systematic policy responses toward greener policy may altogether dampen, not to say cancel, the positive technique effects underscored in the Copeland-Taylor multilateral case.

4. Global value chains, transport, and institutions at regional level

All the tentative estimates above suggest that the RTA-partner country one particular country is trading with indeed matters when dealing with the environmental consequences of trade. We now explore some complementary drivers for change in the trade and environment relationship at regional level, namely values chains motives for specialisation, transport environmental costs, and heterogeneous policy responses to environmental damages at regional level. These were not – or not fully - taken into account in the Copeland-Taylor international economics framework.

4.1. Global value chains

Providing a different perspective to, and rationale for, international trade when compared with the classical factor endowment motive, global value chains (GVCs) are defined as networks of production, distribution and marketing of particular products or groups of products. During most of the 1990s, the main components of value chains were defined as comprising an input–output structure or configuration; a specific geography; and an internal governance structure (Gereffi, 1994). The notion of ‘internal governance structure’ was elaborated in relation to the distinction between ‘buyer-’ and ‘producer driven’ commodity chains, the consequence being that it is the nature of specific categories of lead agent which determine input–output structures and chain geographies, instead of the conventional factor endowment explanation

found in economic textbooks (Gibbon, 2003). Many GVC case studies deal with apparel, an exemplary ‘buyer-driven’ chain¹¹.

More recently, GVC approaches to international trade have come across environmental issues. For instance, the question ‘Who owns China’s carbon emissions’ originally raised by Chinese officials claiming that China’s GHG emissions were partly triggered by international demand-driven value chains has pervaded into both climate change and trade community debates. The responsibility of world trade in CO₂ emissions is still under scrutiny, especially in the case of US- China trade. Shui and Harriss (2006) hence demonstrated that the growth of Chinese imports in the US economy boosted the total emissions of CO₂ from the two countries by over 700 million metric tons between 1997 and 2003. They further showed that American emissions would have been 6% higher, had the US firms manufactured the products imported from China. Meanwhile, China’s emissions would have been 14% lower had it not produced goods for the US. Other studies, with different accounting methodology, estimate that Chinese exports whose major part goes to the US and EU embedded 28% of China energy consumption, against 6% and 7% respectively in the case of EU and US exports. Exports by China would account for as much as 34% of China energy emissions. Other studies conclude that in 2004 – the most recent year in which comprehensive data is available – net exports from China accounted for 23% of its total CO₂ emissions (Wang and Watson, 2007). In the same vein, Peters and Hartwich (forthcoming) assessed the balance of emissions embodied in trade in trade (BEET) for a number of countries, and concluded that China’s BEET (embodied emissions in exports less embodied emissions in imports) was 585.5 MtCO₂, compared to the United States’ BEET of -438.9 MtCO₂ (see Table 1).

Table 1. Balance of emissions embodied in trade for selected countries

	Annex B			Non-Annex B	
	BEET MtCO ₂	BEET as a % of production-based emissions		BEET MtCO ₂	BEET as a % of production-based emissions
Switzerland	-63.1	-122.9%	Singapore	-62.8	-128.2%
Latvia	-4.6	-60.7%	South Korea	-45.4	-11.4%
United Kingdom	-102.7	-16.6%	Morocco	-2.5	-6.3%
Germany	-139.9	-15.7%	Mexico	-17.6	-4.5%
Japan	-197.0	-15.3%	Brazil	+2.5	+0.8%
United States	-438.9	-7.3%	India	+70.9	+6.9%
Canada	15.5	+2.8%	China	+585.5	+17.8%
Australia	57.9	+16.5%	Indonesia	+58.1	+19.0%
Russia	324.8	+21.6%	South Africa	+123.5	+38.2%

Source : Peters and Hertwich, forthcoming ; see also Keijun and Cosby (2008) p. 4

In general, as comment Keijun and Cosby (2008), Annex B countries—those with Kyoto targets— were found to be net importers of CO₂ emissions. But as a percentage of production-based emissions, variations are considerable. The highest impacts were for small trade intensive economies. Though these figures deserve further research to support the discussion, they suggest that the positive composition effect outlined in the SO₂-factor endowment case did not occur for GHG emissions, at least for those embedded in EU and US trade with an emerging country like China.

¹¹ Appelbaum & Gereffi (1994), Bonacich & Waller (1994)

Embeddedness is also of concern when accounting for the environmental consequences of various transport modes. The specific issue of the amount of carbon embedded in air exports from long distance supplying countries, and particularly remote developing countries, have received considerable attention within the so called ‘food miles’ debate. For each of these two aspects of embeddedness, RTAs have the potential to both reduce the embedded carbon content of exports by shortening distances, and to provide the appropriate policy framework for a closer cooperation between a restricted number of countries at a time when multilateral talks, with the Doha round in sands and the post 2012 climate change agenda still in limbo, seem arduous to finalise. By lowering environmental transport costs and enhancing environmental cooperation, RTAs could hence have the potential to counterweight the likely negative scale, composition and technique effects derived from the restrictive application of the international economics framework outlined above. To what extent such a potential is real remains worth examining on a case by case basis.

4.2. Transport

Growth in freight transport volume is strongly correlated with growth in world gross domestic product. Shortening distance between importing and exporting countries could reasonably reduce the environmental footprint of exchanged goods, all else equal. Still, from a pure environmental perspective – and specifically, having in mind greenhouse gases emissions - long distance commercial transport is not the top polluter. CO₂ emissions from the transport sector account for 20% of the global total, with about three-quarters coming from road vehicles. Seaborne transport, whereby most goods are exchanged over long distance trade, is one of the lowest pollution modes and a marginal contributor to greenhouse per ton kilometre (table 2). Maritime transport is currently responsible for approximately 13 % of the world's total transport greenhouse gas emissions (European Environmental Agency, 2008).

Table 2. CO₂ emissions of various transport modes

Mode of transport	CO ₂ emissions (g/tkm)
Lorry (12t)	110
Lorry (24t)	92
Lorry (36t)	84
Maritime shipping	14
Train	23
Plane	607

Source: Source : Eurostat (2003), Ecoinvent (2007), UBA (2006), data collected by Kraemer, Hinterberger and Tarasofsky (2007)

Projections foresee an emission growth of 35–45 % in absolute levels between 2001 and 2020, based on expectations of continued growth in world trade and providing that no actions are taken to limit emissions per ton-kilometre¹². This remains below air freight and inland transport projections (European Environment Agency, 2008). Further, the complete lack of environmental regulation – pertaining specifically to energy efficiency – in international

¹² The current climate framework (both UNFCCC and Kyoto Protocol) is built on a comprehensive rather than on a sectoral basis since it encompasses all sources and sinks of the 6 major GHGs from all sectors. The only exceptions to this comprehensive approach relate to: “bunker fuels” used in international aviation and shipping, which are excluded from national emissions and then from national targets; and land use and land use change and forestry (LULUCF) which are distinguished from other emissions sources and addressed by separate provisions)

maritime transport leaves room to make seaborne transport even more energy efficient and the ‘less bad mode’ of transport well ahead of air freight and road vehicles on a ton kilometre basis (International Energy Agency, 2007).

Counter-intuitively, regional trade could also lead to an increase in transport-induced GHG emissions as soon as road freight transport substitutes to long distance maritime transport. Inland freight transport (road, rail and inland waterways) in the European economic area (EEA) member countries indeed increased by 30 % (2.7 % per annum), with the road freight segment witnessing the greatest percentage increase (38 %). In China, the International Energy Agency estimates that transport-sector oil use would increase from 115 MT per annum in 2005 to 442 MT in 2030, roughly the same as the EU at that time (International Energy Agency, 2007). This is a 5% annual increase, double the expected demand growth for energy as a whole. Currently, the transport sector accounts for a relatively small share of China’s total oil demand (33%), compared with the global average of 50%. Although such domestic growth cannot be systematically associated with trade – and regional trade in particular –, it underlines how restrictive is the hypothesis of a reduction in long distance freight transport ‘all else equal’.

The case for a reduction through RTAs in air freight-induced environmental cost is more straightforward. The Stern Review reports that emissions from aviation have been rising faster than other sectors in recent years, largely as a result of global trade. Currently aviation accounts for 2 per cent of global GHG emissions and this proportion could double by 2050. Yet, within the aviation industry it is difficult to discern the driver for expansion, and particularly air freight. Estimates in the case of UK show for instance that while accounting for an estimated 14–18 per cent of global air freight, the overwhelming majority of export horticulture is transported in the bellyhold of passenger planes, not in dedicated freighters – hence the wide error margin in the assessment. In spite of the difficulty to account accurately for the role of air-freighted food and agricultural products in the rise of aviation emissions, ‘food miles’ have taken a high profile in climate, trade and development crosscutting debates. In the UK, passenger flights account for 90 per cent of emissions from air transport, and international freight accounts for 5 per cent. But as MacGregor and Vorley (2007) underline, air freight is a significant contributor to total food transport emissions in the UK: only 1.5 per cent of imported fresh fruits and vegetables arrive in air transportation but that portion produces 50 per cent of all emissions from fruit and vegetable transportation. Goods air freighted from Kenya are responsible for 200 times more emissions or 12 times more energy than goods that are shipped from Kenya. When considering air transport emissions alone, the case for shorter distance trade is compelling from a climate change perspective.

More controversial have been the policy aspects of food miles. To avert the potentially detrimental and unfair consequences for African producers of food miles labelling on their product in UK supermarkets, researchers and Ngo’s have reconsidered – and rebalanced indeed - the overall carbon cost of fresh food produce in Sub-Saharan Africa and UK, while stressing the right to emit a certain amount of carbon for development objectives when this amount per capita is spectacularly low¹³. Air-freight of FFV from SSA accounts for less than 0.1 per cent of total UK carbon emissions. According to MacGregor and Vorley (2007), an estimated £200 million is injected into rural economies in Africa through fresh fruits and vegetables trade with the UK alone. They conclude ironically: ‘The less than 0.1 per cent of carbon emissions used to air freight FFV from SSA is a relatively efficient “investment” by

¹³ *Shifting hence from ‘food miles’ to ‘fair miles’, see MacGregor and Vorley (2006)*

the UK in allocating its emissions to support over a million African livelihoods. One might ask what the development benefits of the other 99.9 per cent of emissions are’.

4.3. Institutions

The limited number of countries involved in RTAs – when compared to multilateral trade agreements – and the diversity of integration options for trade-related issues such as labour and environment make RTAs a scrutinised vehicle for sustainable trade. The proliferation of RTAs in addition to rising environmental and social concerns over the consequences of trade liberalisation has somehow shifted expectations over RTAs from the early 2000s on. The original question asking whether RTAs were building blocks or stumbling blocks to the world trade system is now progressively replaced by questions evolving around the coherence of RTAs rules and provisions on trade-related issues, and their effectiveness in delivering on particular environmental or labour aspects of trade. Having in mind that in our typology of RTAs policy responses and flexibility were crucial determinants of the ultimate environmental impact of regional trade – to be empirically assessed in the particular case of emerging and developing countries -, we examine the different modes of inclusion of environmental policy and commitments in RTAs, particularly when developing countries are involved.

We heavily draw upon a review undertaken by OECD on environment and regional agreements, which provides up-to-date insights on this issue (OECD, 2007). So far, the OECD study shows, the most ambitious agreements, from an environmental point of view, include a comprehensive environmental chapter, or are accompanied by an environmental side agreement, or both. At the other extreme are those agreements which deal with environmental issues only in the form of exception clauses to general trade obligations under the agreements. Between these two poles is a variety of more or less detailed handling of environmental issues. The most common environmental component is environmental co-operation mechanism. The areas of co-operation in different RTAs vary significantly however, and depend on a range of factors, *e.g.* on whether the trade partners have comparable levels of development or not (in which case, co-operation often focuses on capacity building), or whether they have common borders. Box 1 describes the various modes of environmental integration in RTAs depending on whether they are North-South or North-North RTAs.

Box 1. Environmental provision in North-South and South-South RTAs

North South RTAs. The best-known example is the North American Free Trade Agreement (NAFTA), which includes detailed, legally binding environmental provisions, and has, in addition, a side agreement on environmental co-operation. All RTAs subsequently negotiated by the United States include environmental considerations both in environmental chapters and in separate instruments, focussing mainly on environmental co-operation. These agreements explicitly provide for an obligation by the Parties to effectively enforce their environmental laws, and include mechanisms to ensure enforcement of this commitment (*e.g.* dispute settlement and public submissions mechanisms). They also provide for environmental co-operation between the Parties, and are accompanied by an environmental co-operation agreement or memorandum of understanding that establishes the framework for such co-operation. Under the Trade Act of 2002, the United States has a mandate by Congress to provide for detailed environmental chapters in all trade agreements, including certain binding obligations.

Within the Euro-Mediterranean Partnership, a wide framework of political, economic, and social relations between the Member States of the European Union and countries of the Southern Mediterranean region establish co-operation, aimed at preventing deterioration of the environment, controlling pollution, and ensuring the rational use of natural resources. In the Partnership Agreement between the Members of the African, Caribbean, and Pacific group of States and the European Community states that environmental co-operation should endeavour to mainstream environmental sustainability into all aspects of development co-operation, strengthen the scientific and technical human and institutional capacity for environmental management, and support specific measures and schemes aimed at addressing critical sustainable management.

There are also countries that do not consider the inclusion of environmental considerations in trade agreements to be a priority. An example, among OECD countries is Australia: while sustainable development and environmental protection is high on its agenda, it takes the view that environmental co-operation should generally be dealt with independently of trade negotiations.

South South RTAs: Some RTAs which initially did not have an environmental chapter have evolved over time, and Parties have added on environmental commitments over the years, e.g. through a protocol to the agreement. MERCOSUR members, for example, adopted a Framework Agreement on Environment in 2001, ten years after the adoption of the main trade agreement. Parties to ASEAN have also gradually expanded co-operation on environmental matters. A few agreements also strive for harmonisation: under the MERCOSUR Framework Agreement on Environment, for example, Parties undertake to co-operate on the harmonisation of environmental standards. In Mercosur, Environmental co-operation, detailed in the Framework Agreement on Environment, is defined quite broadly, not only addressing shared environmental problems related to trade, but also the sustainable management of natural resources, environmental planning, and environmental policy instruments.

The Common Market for Eastern and Southern Africa (COMESA) was established as an 'organisation of free independent sovereign states which have agreed to co-operate in developing their natural and human resources for the good of all their people.' As such it has a wide-ranging series of objectives, which necessarily include in its priorities the promotion of peace and security in the region. Its main focus is 'the formation of a large economic and trading unit that is capable of overcoming some of the barriers that are faced by individual states'. Other smaller regional integration agreements, such as the West African Economic and Monetary Union (WAEMU), also aim to co-ordinate sectoral policies, including policies related to the environment, though with less clear (or extensive) provisions or institutions.

Source: OECD (2007)

Most RTAs reviewed deal with environment through environmental co-operation, and conceive environmental co-operation as capacity building with dedicated financial assistance. One example of an RTA including pledge not to lower environmental standards in an effort to increase exports or to attract investment is the Trans-Pacific Strategic Economic Partnership, whose Parties agree that 'it is inappropriate to relax, or fail to enforce or administer, their environment laws and regulations to encourage trade and investment'. In some RTAs, parties pledge to raise or maintain high environmental standards. Under the North American Agreement on Environmental Cooperation, for example, Parties 'shall ensure that [their] laws and regulations provide for the highest levels of environmental protection and shall strive to

continue to improve those laws and regulations'. In practice however, it is very difficult to assess whether provisions aimed at raising environmental standards have been effective.

So far, the OECD report emphasises, only few trade agreements between developing countries or emerging economies include references to the environment. The main exceptions are RTAs including Chile, and Mercosur. It would be wrong to assume that including environmental considerations in trade agreements has become generally accepted or can even be taken for granted. On the contrary, negotiators have pointed out that it remains a challenge, first to convince their partners to accept the principle of including environmental issues at all in an RTA, and then, to negotiate the details.

Further, while RTAs have contributed to better integration of trade and environment at bilateral and regional levels, this progress is not yet visible in the multilateral arena. Indeed, it is striking that a number of countries have been prepared to incorporate environmental provisions in RTAs, but are not prepared to countenance similar outcomes at the multilateral level. Last, with the current proliferation of RTAs, and the variety of environmental arrangements, some countries face a web of different levels of environmental commitments the increasingly complex problem of managing various levels of environmental commitments and different types of environmental co-operation programmes under a range of RTAs. One example is Chile, which has entered into RTAs with a range of countries, including OECD members (Canada, Korea, Mexico, the United States, New Zealand), the EU and developing countries (China, Colombia, and Panama), all of which include at least some reference to the environment.

Globally, no clear-cut empirical evidence emerges on the effective commitment of developing countries toward enhancing environmental inclusion in RTAs. This said, the wide range of policy options and cooperation mechanism at disposal, along with the limited number of players, would seem to leave wider room for institutional innovation, targeting and flexibility in the making of accompanying policies when compared to the multilateral framework. Possible ways to use this policy space from an environmental and development perspective, so as to mitigate the likely negative scale, composition and technique effects possibly arising from RTAs are outlined in the last section.

5. Can RTAs be a lever for environmental agreements? The case of climate change

Debates on the trade and climate change nexus have been growing steadily for the last couple of years, focusing on two main sets of issues. The first one relates to the physical impact of trade on climate change, and to the best policy liable to address the possible negative impacts of trade. The food miles and transport emissions controversies enter into this first set of issues. Conversely, the impact of climate change policies on trade was also questioned. Questions asked were then: do climate change policies undermine the competitiveness of carbon-constrained firms and hamper its exportations? What would be the efficiency of compensation/adjustment mechanisms such as a carbon import tax?

Controversial from the outset, the idea to use trade policies to meet climate change objectives dates back to the then French Prime Minister De Villepin's initiative during the UN 2006 Environment Summit. Entitled "Border Tax Adjustment" or BTA, the initiative remains on the top of the French Agenda on climate change, in spite of harsh criticism from the European Commission DG Trade commissioner who dismissed it as "bad politics". Nevertheless, the EC issued in 2008 its Energy and Climate package, in which it acknowledged that an ever

growing range of EU industries submitted to the EU ETS mechanism could face competitiveness issues, and consequently asserted that the opportunity to use border compensation/adjustment mechanisms would be examined by 2011, their implementation being conditioned by the explicit failure of multilateral talks on climate change.

The complexity of the trade and climate change relationship underlines the difficulty to “use one negotiation for another” and make trade a lever in climate negotiations, and conversely to make climate policies a lever – or incentive - to increase market access. The WTO official position remains that trade should be used as a carrot, and not as a stick, contrary to the French BTA proposition. In a speech to the European Parliament on May 2008, the WTO Director-General Pascal Lamy asserted that ‘the relationship between international trade, the WTO, and climate change, would be best defined by a consensual international accord on climate change. (...)A multilateral agreement, that includes all major emitters, would be the best placed international instrument to guide other instruments, such as the WTO, as well as all economic actors on how negative environmental externalities must be internationalized. (...). Only such an accord could provide criteria for assessing when a measure at the country’s border is environmentally sound. (...) In the absence of such parameters, it will be hard, if not impossible, for the WTO to develop a coherent position on the matter. Each of its members will have a different interpretation to offer on how the playing field may best be levelled. And I would caution against such an outcome; the world could end up with a real spaghetti bowl of “offsetting” measures that achieve neither nor trade nor environmental goals’ (Lamy, 2008).

Pascal Lamy’s arguments cannot be disputed in a first best-policy perspective. But a reason why trade and climate have relentlessly come out as intertwined issues in climate and trade debates respectively stem from the mere fact that this first best perspective might be unrealistic, and that non multilateral trade and climate deals could actually replace the first best solution Pascal Lamy delineated. Keeping in mind that a multilateral climate accord *and* a multilateral trade agreement altogether provide the first best institutional framework to make trade and climate change policies mutually supportive, the second-best question is how to best use potentially inflating regional and bilateral deals or initiatives on both issues while multilateral talks are in stuck in sands.

Box 2. BIC countries and GHG emission

When emissions from land use, land use change and forestry (LULUCF) are taken into consideration, Brazil is of the top five producers of GHGs; and the country is unique in that three-quarters of its emissions are due to deforestation (Osava, 2007). Brazil is also unique among the BICSAM nations in that 90 per cent of domestic electricity needs are met through hydropower generation (La Rovere, 2007: 78). Brazil lacks a national policy on climate change, but has adopted an action plan on the control of deforestation and a program on alternative energy sources. Key issues for Brazil are eliminating deforestation; correcting the direction of the country’s energy base, which will become dirtier in future years; and maintaining leadership in the biofuels sector. Brazil has a long history of fuel ethanol use and a current government mandate of 25 per cent ethanol blending in gasoline. Brazil accounts for 17 per cent of global ethanol production, and has increased export levels (mainly to the United States) since 2000 (Nexant Chem Systems, 2007).

The National Council on Climate Change is in the process of developing a comprehensive national policy on climate change issues, including a “Green India” reforestation program. India’s economy is growing at a rate of eight to nine per cent a year and contributes four per

cent of global GHGs—an amount that is growing between two and three per cent annually (Mok, 2007). India suffers from higher rates of poverty than the other BICSAM nations, suggesting the need for different strategies of engagement. India's large rural population depends on climate-sensitive sectors (agriculture, fisheries, forests) and is extremely vulnerable to shifts in weather systems and ecosystems.

While the other BICSAM nations are influential, China is in a league of its own in regard to the magnitude of its economic growth, impact on global aggregate emissions and its ability to attract interest from the EU and other developed countries on climate change issues. With 20 per cent of the world's population and continued rapid economic growth (between eight and 12 per cent for the past decade), the expected rise in emissions could potentially dwarf any reductions made by developed countries. China has surpassed the United States in CO₂ emissions to become the world's leader and with sustained high growth rates will open the gap even further.

Source: Murphy, Drexhage, Cosbey, Tirpak and Egenhofer (2008)

Focusing on the EU, some initiatives which are now being undertaken toward developing countries, and especially toward BIC countries, demonstrate the opportunities but also the limits of a bilateral approach to climate change. Hence the EU and Brazil met in their first-ever Summit in Lisbon on July 4th, 2007 to launch a Strategic Partnership on a range of areas, including close cooperation on global challenges such as environmental issues (particularly climate change, forests, water management and biodiversity), sustainable energy resources, as well as enhancing stability and prosperity in Latin America. Agreement was reached on an EC-Brazil Regular Energy Policy Dialogue, aiming at strengthening energy cooperation through bilateral action in the areas of biofuels and other renewable energy sources, low-carbon energy technologies and the improvement of energy efficiency. But in spite of all these efforts, EU and Brazil positions in climate negotiations have not converged thus far.

This remains true in the case of India and China. Seven years before the first EU-Brazil summit, the EU and India launched the first EU-India summit. There exists now a formal EU-India strategic partnership with a joint action plan (adopted in September 2005) including environment, climate change and energy. This includes an EU-India initiative on clean development and climate change, largely concentrating on practical yet voluntary measures such as the promotion of clean technologies in the context of the clean development mechanism. An EU-India energy panel inaugurated in June 2005 set up three working groups in coal and clean coal conversion technologies, energy efficiency and renewable energies, and fusion energy including India's participation in the ITER project.

EU annual summits are even older in the case of China - they date back to 1998. Bilateral sectoral agreements and dialogues have been struck that cover the environment, energy, standards and regulation for industrial goods, and science and technology (Murphy, Drexhage, Cosbey, Tirpak and Egenhofer, 2008). At the conclusion of the 8th EU-China Summit in Beijing in September 2005, China and the EU signed a partnership on climate change focusing on clean coal technology with the aim of demonstrating, in China and the EU, advanced 'zero-emissions' coal technology by 2020¹⁴.¹⁶ Still in the area of energy policy, the EU and China established the Energy Environment Programme to promote sustainable energy use, with activities taking place under four components: energy policy development,

¹⁴ In March 2005, the Commission's Directorate-General for Transport and Energy and the Chinese Ministry for Science and Technology also signed an Action Plan on Clean Coal and terms of reference for an Action Plan on Industrial Cooperation on Energy Efficiency and Renewable Energies

energy efficiency, renewable energy and natural gas (Murphy, Drexhage, Cosbey, Tirpak and Egenhofer, 2008). Still, China does not seem to value this partnership up to the point where it should accept binding commitments of emission cuts.

Can such partnership and cooperation initiatives mitigate the detrimental effects of North - South rich trade derived from our interpretation of Scott and Taylor in a bilateral or regional framework? A rationale for second best, climate-enhancing RTAs or PTAs lies in the potential use of regional trade as a lever for climate deal, and conversely in the potential use of climate policies as a lever or bargaining tip for market access – the so-called ‘issue linkage’ effect. Issue linking within RTAs in this case would provide an incentive for emerging countries to be further involved in curbing global warming, and conversely, a lever for emerging countries to be conceded greater market and technology access in OECD countries. In the case of EU-China trade for instance, alternative options to the envisaged BTA or BCA mechanisms could take the form of a mix of export taxes in China on key EU ETS constrained sectors such as cement and steel, in addition to technology transfers and investment flows. Such a mix should closely associate States and firms in the bargaining process, as RTAs with a limited number of players do permit. In the same vein, improved EU market access could be conceded to Brazilian products – and particularly so to agricultural and agro-energy products – in exchange of Brazilian support of (some of) EC positions in the negotiation of climate change policies in the post-Kyoto area. The same rationale would apply to EU-India bilateral trade, conceived as a lever for broader coalition around EU position on climate change.

Though reasonable and seductive on the paper, linking trade and climate issues to bolster fight against global warming suffers serious drawbacks in the particular case of RTAs and PTAs involving emerging countries. The most serious one is the limited policy space that emerging countries and OECD (and particularly the EU) countries have managed to open jointly so far. Be it in the case of Brazil (Mercosur), India or China, no formal trade agreement links them to the EU, despite years of negotiations in some cases (EU-Mercosur). Table 3 gives an overview of RTAs notified to the GATT/WTO and in force which involve BIC countries.

Table 3. Regional Trade Agreements notified to the GATT/WTO and into force, as of May 08

Agreement	Date of entry into force	Date notified by Parties*	Related provisions	Type of agreement **
ASEAN-China	1-juil-03	24-nov-04	Enabling Clause	PS
APTA-Accession of China	1-janv-02	30-avr-04	Enabling Clause	PS Accession
China-Macao, C	1-janv-04	27-déc-03	GATS Art. V	EIA
China-Hong Kong	1-janv-04	27-déc-03	GATS Art. V	EIA
Pakistan - China	1-juil-07	18-janv-08	GATT Art. XXIV	FTA
Chile-China	1-oct-06	20-juin-07	GATT Art. XXIV	FTA
India-Sri Lanka	15-déc-01	17-juin-02	Enabling Clause	FTA
India-Singapore	1-août-05	3-mai-07	GATS Art. V	EIA
SAPTA	7-déc-95	21-avr-97	Enabling Clause	PS
APTA	17-juin-76	2-Nov-76*	Enabling Clause	PS
MERCOSUR	29-nov-91	17-févr-91	Enabling Clause	CU

Source: WTO

Note:

* Dates of WTO documents containing notification

** CU=Customs Union; EIA=Economic Integration Agreement; FTA=Free Trade Agreement; PS=Partial Scope

Neither North-South rich nor South rich – South poor RTAs have been notified so far. This vacuum can even be filled by trade disputes in some cases. In a recent WTO dispute brought by India against the EU, complaining about the granting of additional preferences for particular countries on the grounds that they were assisting in the combating of drug production and trafficking, the Appellate Body clarified that 'non-discrimination' does not prohibit developed countries granting differential tariff treatment to developing country Members, provided that identical treatment is available to all similarly-situated beneficiaries. BICs and the EU remain foes more than friends in trade talks. Exploiting linkages between trade and climate change in this context is not impossible – and it should even turn out reasonable as long as negotiations are stuck when restricted to either trade or climate change. But issue linking can work only if trade is used as a carrot for climate change, and conversely. Using climate policies – or foot-dragging - as a stick, as Brazil intended to do to hasten EU market opening, proves to be as inefficient as EU strategy to use trade protection as a stick to hasten a global deal on climate change.

6. Conclusion

The broad question we have tried to address in this chapter is to what extent regional trade and RTAs provide effective opportunities to implement the environmental agenda. To answer, we have turned it this way: does regional trade affect the trade-environment relationship formalised by Copeland and Taylor in a multilateral framework, and if so, in what direction? Our main findings are that the drivers of positive environmental change induced by freer trade in the multilateral case are very unlikely to be met in a wide range of regional trade patterns and agreements. South-South RTAs in particular could see the positive technique and composition effects we find in Copeland and Taylor analysis either turn negative or

counterbalanced by a huge and negative scale effect. Examining to what extent a shortening of distances between exporting and importing countries in the case of RTAs could reduce the pollution generated by transport, we find little evidence of significant pollution reduction. Last, the potential of RTAs to provide member states with the opportunity to link trade and climate change negotiation issues and hence escape negotiations impasses seems limited when compared with the range of issue linkages offered by multilateral talks, all the more so existing trade agreements between the most polluting countries are much closer to loose partnership and cooperation schemes than RTAs per se.

References

- Antweiler W., Copeland B.R. and Taylor, M.S. (2001) 'Is Free Trade good for the Environment?', *American Economic Review* 91(4), September, pp877-908
- Appelbaum, R.P. and Gereffi, G. (1994) 'Power and Profits in the Apparel Commodity Chain', in E. Bonacich, L. Cheng, N. Chinchilla, N. Hamilton, and P. Ong (eds.), *Global Production: The Apparel Industry in the Pacific Rim*, Temple University Press, Philadelphia
- Bhagwati, J. (2004) *In Defense of Globalization*, Oxford University Press
- Bonacich, E. and Waller, D. (1994) 'Mapping a global industry: apparel production in the Pacific Rim triangle' in E. Bonacich, L. Cheng, N. Chinchilla, N. Hamilton, and P. Ong (eds.), *Global Production: The Apparel Industry in the Pacific Rim*, Temple University Press, Philadelphia
- Charnovitz, S. (2007) 'Trade and the Environment in the WTO' *Journal of International Economic Law*, Vol. 10, September
- Copeland, B.R. and Taylor, M.S. (2003) *Trade and the Environment*, Princeton University Press
- Copeland, B.R. and Taylor, M.S. (2004) 'Trade, Growth and the Environment' *Journal of Economic Literature* vol XLII (March), pp7-71
- Delgado, J. (2007) 'Why Europe is not Carbon Competitive', Bruegel Policy Brief 2007/05 November
- Ecoinvent (2007) Ecoinvent database, version v1.3, Swiss Centre for Life Cycle Inventories (Ecoinvent Centre), Empa Dübendorf, Switzerland.
- Economy, E. (2007) 'The Great Leap Backward?', *Foreign Affairs*, Sept-Oct
- Esty, D. (1994) *Greening the Gatt*, Institute for International Economics, Washington, DC
- Esty, D. (2005) 'Economic integration and environmental protection', in R.S. Axelrod, D.L. Downie and N.J. Vig (eds), *The Global Environment. Institutions, Law, and Policy*, CQ Press, Washington, D.C.

European Environmental Agency (2008) 'Climate for a transport change', EEA Report 1/2008. http://reports.eea.europa.eu/eea_report_2008_1/en/EEA_report_1_2008_TERM.PDF

Eurostat (2003) *Transport and Environment Database System (TRENDS)*, Statistical Office of the European Communities, Brussels, Belgium

Gereffi, G. and Korzeniewicz, M. (1994) *Commodity Chains and Global Capitalism*, Greenwood Press (hardcover) and Praeger (paperback), Westport, CT.

Ghosh, S. and Yamarik, S. (2007) 'What is the effect of regional trading arrangements on the quality of the environment', mimeo

Gibbon, P. (2003) 'The African Growth and Opportunity Act and the Global Commodity Chain for Clothing', *World Development* 31(11), pp1809-1827

Grossman, G.M. and Krueger, A.B. (1993) 'Environmental Impacts of a North American Free Trade Agreement', in P. Garber (ed.) *The Mexico-US Free Trade Agreement*, MIT Press, Cambridge

IISD (2008) *Sustainable Development : China and Global Markets. A Supply Chain Analysis*, forthcoming

Jones, A. (2006) 'A life cycle analysis of UK supermarket imported green beans from Kenya', Fresh Insights 4

Kejun, J. and Cosbey, A. (2008), 'Embedded Carbon in Trade Goods', Background paper, Trade and Climate Change Seminar, June 18-20, 2008, Copenhagen, Denmark.

Kraemer, R.A., Hinterberg, Dr.F., and Tarasofsky, R. (2007) 'What contribution can trade policy make towards combating climate change?', study for the Policy Department External Policies, European Parliament.

La Rovere, E.L., Pereria, A.O., Smioes, A.F., Pereira, A.S., Garg, A., Halsnaes, K., Schmidt Dubeux, C.B. and Cunha da Costa, R. (2007), 'Development First: Linking energy and emissions policies with sustainable development for Brazil', Roskilde, Denmark: UNEP Risoe Centre.

Lamy, P. (2008) 'A consensual international accord on climate change is needed', Temporary Committee on Climate Change, European Parliament — Brussels, 29 May 2008, http://www.wto.org/english/news_e/sppl_e/sppl91_e.htm

MacGregor, J. and Groom, B. (2007), 'Air-freighted fresh food: guilty pleasure or sustainable development champion?', Fresh Perspectives, issue 6

MacGregor, J. and Vorley, B. (2006) 'Fair Miles? Weighing environmental and social impacts of fresh produce exports from Sub-Saharan Africa to the UK', Fresh Insights 9

Mandelson, P. (2006) 'Trade and Climate Change', Speech delivered in Brussels, 18 Dec 2006. http://ec.europa.eu/commission_barroso/mandelson/speeches_articles/sppm136_en.htm

Mok, K. (2007), 'India Announces New Climate Change Strategy', *ExpressIndia.com* <<http://www.expressindia.com/news/fullstory.php?newsid=89455>>

Murphy, D., Drexhage, J., Cosbey, A., Tirpak, D. and Egenhofer, Ch. (2008), 'Furthering EU Objectives on Climate Change and Clean Energy. Building partnership with major developing countries', Climate Change and Foreign Policy Project – Phase II report, IISD

Nexant Chem Systems and Expetro (2007), *Brazil's Biofuels: Outlook for a global leader*. New York: Nexant.

OCDE (2007) *Environment and regional trade agreements*, Paris

Osava, M. (2007), 'Climate Change-Brazil: Once and future environmental Leader', *IPS News*. <<http://www.ipsnews.net/news.asp?idnews=37827>>

Peters, G.P. and Hertwich, E.G. (forthcoming) 'CO2 Embodied in International Trade with Implications for Global Climate Policy', *Environmental Science and Technology*

Rodrik, D. (2006) 'What's so Special about China's Exports?', CEPR Discussion Paper No. 5484

Shui, B. and Harriss, R.C. (2006) 'The Role of CO2 Embodiment in US-China Trade', *Energy Policy* 34(18), pp4063-4068

Stern, L. and Tubiana, L. (2007) 'New Deal pour le climat', *Le Monde*, 21 September 2007

Stiglitz, J. (2007) *Making Globalization Work*, W.W Norton and Company, New York.

Taylor, S. (2004) 'Trade, development and the environment', SIDA Trade Brief, February.

UBA (2006) *Luftschadstoffinventur Verkehr*, Umweltbundesamt. Vienna, Austria

Wang, T. and Watson, J. (2007) 'Who Owns China Carbon Emissions?', Tyndall Briefing Note 23, October

Wangler, Z.L. (2006) 'Sub-Saharan African horticultural exports to the UK and climate change: a literature review', *Fresh Insights* 2