

6. Barriers to Linking Carbon Markets in Northeast Asia

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SUMMARY

LINKING CARBON MARKETS can generate sizeable economic, environmental, and strategic gains, yet linking is not without its costs. These costs may frustrate carbon market integration in Northeast Asia even when integration is beneficial. This chapter reviews the economic and political barriers to linking that are behind these costs, first from a general theoretical perspective and then in the specific context of the carbon markets in China, Japan, and the Republic of Korea (hereafter Korea). It highlights three key barriers that policy makers must anticipate and prepare for well in advance. First, the magnitude of the existing permit price differences would imply substantial reallocation of abatement efforts and sizable financial transfers, which will be difficult to sustain from a political economy perspective. Second, linkages between systems featuring absolute and intensity targets on the one hand and operating at subnational and national levels on the other hand will be more challenging to negotiate and implement. Third, any given market's core features must be shielded from political interference to establish a track record as a credible partner posing minimal regulatory risk in a potential linkage. To facilitate mutually beneficial linkages in the future, this chapter recommends that policy makers in the region start the dialogue with one another early but also actively participate in the ongoing United Nations Framework Convention on Climate Change (UNFCCC) efforts to flesh out the mechanisms supporting the implementation of Article 6 of the Paris Agreement. Finally, it is essential that all stakeholders in the region draw on the lessons learned from the successful linkages emerging around the globe.

BARRIERS TO LINKING CARBON MARKETS IN NORTHEAST ASIA

Barriers that may slow down or even stop the process of carbon market integration through linking come in various shapes and sizes. Some are particularly relevant in the Northeast Asian context, while others apply more generally. Efforts to overcome such barriers are economically and politically costly.

These costs as well as the many economic, environmental, and strategic benefits of linking carbon markets in China, Japan, and Korea are the subject of this chapter.¹ Crucially, neither the benefits nor the costs of linking are distributed evenly across and within the countries. Therefore, it is crucial that policy makers anticipate the barriers well in advance and consider their response options carefully.

ECONOMIC BARRIERS TO LINKING

Carbon markets give companies an economic incentive to adjust their emissions. The incentive is provided by the price at which companies can obtain emissions permits (sometimes called allowances) in the primary, secondary, or derivatives markets, which in turn must be surrendered to the government for compliance.

Many factors and complex interactions between them determine the day-to-day movements in the permit price. The average level of the permit price, however, is determined by the actual and perceived scarcity of permits, which is controlled by the policy maker through the number of permits and other means made available to companies for compliance (sometimes called their compliance obligations). For example, fewer permits and offsets imply a higher price on average because companies are required to deliver greater and costlier emissions reductions.

Permit Price Differences in Autarky

Any difference between average pre-linking permit prices, also known as autarky prices, presents both an opportunity and several challenges. It is an opportunity because linking the two markets will eliminate the price differential as abatement effort is reallocated. In turn, this implies the aggregate emissions reductions are achieved at a lower cost than would be the case if the markets were not linked. Typically, both countries stand to gain from these cost savings.

On the flipside, these mutually beneficial cross-border permit transactions imply financial transfers from permit buyers to sellers that are located in different countries. This may be politically unpalatable. The relocation of abatement effort across borders also implies the redistribution of the co-benefits of abatement, such as reduced local pollution, greater learning-by-doing in abatement activities, improvements in energy security, and so on.

The equalization of permit prices creates a more level playing field for international trade between the two countries and as they compete in third-country markets. It also creates winners and losers located potentially in different countries. There are no simple mechanisms through which those who gain can compensate those who lose even when changes in the trade patterns induced by carbon market linkage generate net benefits in aggregate.

Moreover, the decision to link carbon markets may well interact with a country's decision regarding the stringency of its cap. In particular, there is a chance that countries that expect to be net sellers of permits in a future linked market will strategically inflate the number of permits they issue today. This could imply greater emissions when markets are linked relative to the case when they operate in isolation.² Even when the number of permits can be shielded from such strategic manipulation, there may be post-linking incentives to relax monitoring and enforcement in countries that expect to be net sellers.

Market Design Differences

No two carbon markets are identical, and market design features that are desirable in one setting may be ill-suited elsewhere. By linking its market, a country is exposed to the design choices of its partners. Indeed, an argument of revealed preference suggests that if a country has chosen feature X over a potential linking partner's choice of the alternative feature Y, it is because X must be preferable given the country's circumstances and objectives. Linking can imply that consequences of both X and Y will be experienced in both countries.

The determination of the emissions target in a given year, a core design feature of any carbon market, is a case in point. An absolute target imposes a mass-based limit on the total emissions and issues a fixed

number of permits accordingly. An intensity target specifies a rule that determines the total number of permits based on a yet-to-be realized variable. Both approaches are found in Northeast Asia, as discussed later. Economic theory and differences among existing carbon markets suggest country-specific economic characteristics (e.g., the level, volatility, and correlation of economic output and emissions) may render an absolute target in one country desirable, while an intensity target is preferred elsewhere.³ When linked, the increase in emissions uncertainty of the country with the absolute target may be unacceptable, perhaps to the extent that it precludes linking.

A similar barrier to linking arises if the markets' cost containment mechanisms differ in the countries contemplating a linkage. These can include whether banking and/or borrowing is permitted and if so to what extent; emissions reserves; price controls such as price ceilings, floors or collars, and offsets. Consider, for example, the case of two markets where price collars are in place to prevent large fluctuations in permit prices. For the sake of argument, suppose one country is more comfortable with permit price variability and that this is reflected in a broader range for the price collar that, in particular, contains the partner country's entire price collar range. In this simple but extreme case, the unrestricted linking of the two carbon markets implies that the broader price collar becomes irrelevant—a development that may not be welcome in the country that apparently prefers that the markets, rather than the price collar, determine the permit price.

Anti-leakage provisions in the form of freely allocated permits, and the method by which they are allocated, are already among the most controversial elements of carbon market design in practice. In a similar vein, negotiations with domestic stakeholders regarding the source, type, and quantity of offsets that are allowed into the market to retire obligations can be contentious. Both leakage and offset provisions affect the level and distribution of economic rents captured by different stakeholders. Linkage implies both a rescaling and a redistribution of these rents. As such, it will be contested, which may present a significant stumbling block for the linkage process.

Countries contemplating carbon market linkages should also share a common understanding regarding other carbon market design features. These include each country's approach to permit auctions and the use of the revenues from those auctions; measurement, reporting, and verification processes; operation of allowance registries; dispute resolution procedures; and length of trading and compliance periods. Relative to differences in target type, cost containment mechanisms, anti-leakage and offset provisions, one would expect countries to find common ground more easily along these dimensions.

Differences in economic structure, stages of development, and shock resilience between countries can be important in determining the scale of the barriers to carbon market linkage.

Persistent Differences

As a policy instrument, a carbon market exists in, and interacts with, a complex economic system. A plethora of formal and informal institutional arrangements between the key actors in the country regulates this economic system. Together with historical events and the country's natural and human resource endowments, these arrangements determine the structure of the country's economy, its level of development, and its resilience to withstand domestic and international shocks.

Differences in economic structure, stages of development, and shock resilience between countries can be important in determining the scale of the barriers to carbon market linkage. These variables tend to be particularly persistent over time and difficult for governments to steer in the short to medium run. For example, the demand for permits in an advanced country where most of the gross domestic product is generated in the tertiary sector will behave very differently compared to permit demand in a developing country where the secondary sector is growing rapidly and the country's physical infrastructure, including its energy system, is being built. In addition, countries may have varying degrees of government intervention in the economy, reflecting divergent levels of comfort and experience with markets as the primary mechanism for allocating real and financial resources. They may have different track records in running a carbon market. Loosely speaking, the more dissimilar countries are along these dimensions, the higher the barriers to linking are likely to be.

Conversely, the costs associated with these barriers may prove more manageable for a group of countries with long-standing close international trade and financial ties. Such countries can more easily adapt and extend existing arrangements to also cover carbon market linkages, having over the years built the organizational, institutional, and legal infrastructures that underwrite their economic ties. However, such familiar relationships can at times be accompanied by historical animus and traditions of strategic competition and friction, even in the context of close trade ties. Relationships in Northeast Asia present both sides of this coin.

To summarize, this section highlights three classes of economic barriers to linking. Based on economic considerations alone, it would appear straightforward to confront the barriers arising due to the differences in average autarky prices and in market design. They are, after all, under the direct control of policy makers. On the other hand, barriers due to differences in the maturity of their emissions trading systems, levels of development, and economic structure are harder to grapple with. Policy makers can only influence rather than fully drive these variables. As I argue in the next section, political barriers may confound the problem.

POLITICAL BARRIERS TO LINKING

A domestic carbon market is one of many instruments that can deliver emissions reductions. Moreover, delivering emissions reductions with the aim of contribution to global climate change mitigation efforts is one of many climate policy goals that a government may wish to achieve with its carbon market. The government may also wish to achieve reductions in domestic emissions, incentivize low carbon investment as well as research and development, raise auction revenues, reduce other proximate pollutants, or pave the way for a more equitable distribution of the burden of domestic climate policy on society. While an appropriately designed carbon market can deliver emissions reductions and, at the same time, make a substantive contribution to the achievement of these other goals, linking it with another carbon market or markets may create tensions between goals.

The previous discussion surrounding differences in average autarky permit prices suggests price differences are at the core of the gains from linking. These gains are realized when prices across markets are equalized. Note, however, this implies that the price in one country must decline while it increases in another.

In the country where the permit price declines, *domestic* emissions increase but the price of energy-intensive goods, especially power, may decline. The price signal guiding financial, physical, and human capital toward low carbon investment and innovation is attenuated within the country but enhanced in its partner. Moreover, the volatility of the permit price, an important determinant of investment in principle, may decline in one or both countries. Nonetheless, the country can benefit from the enhanced research and development efforts of its partner because knowledge ultimately is a public good.

In addition, the auction revenues the government collects may decline as the permit price decreases, but the decline in price may be more than compensated for if the country increases the number of permits it auctions because price equalization creates a more level playing field. Finally, the distribution of the policy burden is altered relative to autarky with a new set of winners and losers. Put differently, the country takes a step forward toward some policy goals while moving away from others.

Economic analysis is of little help in this respect, because it is often difficult to identify how a government prioritizes its policy goals. Moreover, minimum acceptable levels for the economic welfare of certain groups, for environmental quality, and for energy security place important constraints on the government's choices and are likely to be important. An incumbent government will also be concerned with implementing policies that will increase its chance of staying in power. In other words, it faces a reelection constraint. Finally, a government may view carbon market linkage as a political goal worth pursuing by itself or as a part of its broader domestic or international agenda, but it may or may not be able to expend the necessary political capital to see it through.

Another aspect of the problem that may prove politically unpalatable for the government is that, by linking, it may in effect cede control over some aspects of its domestic carbon market policy to a foreign government. As discussed earlier in this chapter, the domestic government's position on market design features, such as cost containment mechanisms, may be rendered irrelevant under linking as its partners' choices may propagate across. Even when these changes to domestic policy parameters are welfare enhancing individually and in aggregate, the apparent foreign control of what was once a domestic matter may be difficult to sustain.

Linking also exposes countries to regulatory risks elsewhere. For example, after the linking arrangement is operational, a partnering government may decide to unilaterally impose fees or quotas on cross-border permit transactions, provide exemptions to previously regulated entities, or terminate the arrangement.⁴ These opportunistic behaviors underline the importance of having an independent dispute resolution forum in place, which may prove difficult to implement if there are historical animosities or current regional rivalries between the countries.

OVERCOMING BARRIERS IN THE NORTHEAST ASIAN CONTEXT

How are these economic and political barriers manifested in Northeast Asia and, more importantly, can they be overcome? By now, China, Japan, and Korea have substantial experience with carbon markets.⁵ In China, this experience derives from several subnational pilot carbon markets going back to 2013. These markets deliberately differ in design with a view to building the knowledge base for a robust national system that came into existence in early 2018. The Japanese carbon markets in Tokyo and

Saitama have operated since 2010 and 2011, respectively, and are linked with each other. For more than three years, Korea has operated a national market that is now in its second phase. While the countries' experiences with domestic emissions trading will no doubt be helpful for potential linkages in the future, the cross-country differences along the dimension highlighted earlier can present significant challenges.

Even though China, Japan, and Korea have no near-term plans to link their carbon markets, it is illustrative to consider the hypothetical case of immediate and unrestricted linking of their markets as a thought experiment. Roughly speaking, the aggregate cap in the existing pilots in China is about twice as large of that in Korea, which in turn is several times larger than that in the Japanese systems. Moreover, the recent prices in the Chinese markets were significantly lower than those in Japan and Korea. Taken together, these suggest that in the hypothetical case under consideration, regulated entities in Korea and Japan will

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acquire permits from China, and will have to reduce their emissions more than they would have under autarky. This has several effects including potentially large financial transfers to, and higher compliance costs in, China, as well as greater domestic emissions but lower carbon prices in Korea and Japan.

Of course, the hypothetical case would not take hold in this precise form. It would be difficult, if not impossible, to negotiate a link between the existing *subnational* markets in China and Japan and the national market in Korea. While China is well on its

way to implementing a mandatory national market with what is essentially an intensity target, a mandatory national market is currently not a priority in Japan, and Korea has opted for an absolute target. The existing markets differ substantially in the sectors they regulate with Korea's market covering most economic sectors, while those in Japan exclude the emissions of power and transport sectors.

The priorities of the governments in China, Japan, and Korea also differ widely. The countries are at different stages of economic development. In China, economic growth and poverty reduction continue to be paramount, but concerns over income distribution and worsening environmental quality have gained increasing prominence. Japan is an advanced economy but faces many challenges in maintaining the high standard of living of its aging population while improving its energy security in a post-Fukushima world where its options are limited. Korea has transformed itself from a poor, war-ravaged country in the 1950s to the modern industrialized nation it is today but has to address the legacy of a large carbon- and energy-intensive industrial sector. International trade is central for each country's economic strategy. They compete intensely in one another's markets as well as in third countries to gain market share. Their climate change policies reflect these goals, and future carbon market cooperation will imply trade-offs between them. The countries' historical animosities as well as the delicate and ever precarious relationship each has with North Korea present further challenges. Indeed, the slow progress of the linkage negotiations between the carbon markets of the EU and Switzerland suggests that issues that are not directly related to carbon market integration can significantly hamper their progress nonetheless.

HOW TO OVERCOME THE BARRIERS

The key to reaping the many economic, environmental, and strategic rewards from linking carbon markets is to anticipate the barriers well in advance. By now, there are several real-world instances of linking to draw lessons from.⁶ These include the formation and growth of the Regional Greenhouse Gas Initiative (RGGI) in the United States and the roller coaster relationship the state of New Jersey has had with it; the joint design and smooth operation of the linkage between the state of California and the province of Québec under the Western Climate Initiative (WCI), which recently integrated the province of Ontario without a significant hiccup; and the long and arduous path to the linking agreement between the EU and Switzerland, which is yet to be ratified at the time of writing. China, Japan, and Korea can and should capitalize on the experiences of these markets. Japan's knowhow gained in its linked markets can also be extremely helpful in this context.

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Starting the conversation now, that is, years in advance of a link being operational, will go a long way in aligning the key parameters (e.g., stringency of the cap) and design features (e.g., cost containment mechanisms) of the markets early on or, failing that, enable the countries to establish a mutually acceptable timetable for doing so in the future.⁷ The barriers to linking would be minimized if, in particular, this conversation yielded a plan for China to move from an intensity-based system to a mass-based system, for Japan to expand its city-level and voluntary carbon markets to a mandatory national market, and for Korea to eliminate the policy and regulatory uncertainties that have plagued its carbon market during the early years of its operation.

Moreover, the regional partners may find it beneficial to approach linking gradually. It may, for example, be less costly to link two markets first and add other regional partners later, much like in the broadly successful case of the WCI. This could reduce the challenges associated with negotiating complex agreements multilaterally and allow those with new carbon markets to gain experience and establish a track record domestically first.⁸

Alternatively, or simultaneously, restricted linking options may be considered during a transition period to full linkage.⁹ Quantitative limits or taxes on cross-border permit trade, much like the quotas and tariffs in the international trade of goods and services, can be implemented. Exchange or discount rates that adjust the compliance value of permits by origin and/or destination may also be used to constrain linking options to a range in which the economic and political costs of linking are manageable.

The restricted linking options come with a health warning, however; by constraining what would otherwise be mutually beneficial permit trades, they diminish the gains from linking. The history of international trade in goods and services also provides countless instances where restrictions in the form of tariff and non-tariff barriers end up costing society dearly. For example, the import substitution policies, which were popular in Latin America and elsewhere, failed to nurture the so-called infant industries into engines of growth.¹⁰ Any restrictions on trade also create welfare losses for the society as well as vested interests resisting their eventual removal.¹¹ In recent decades, these restrictions have primarily taken the form

of non-tariff barriers that present unique challenges.¹² These barriers, including quantitative restrictions, rules of origin, and standard-like measures, may be particularly relevant for restricted linkages between carbon markets.

On a more positive note, there is increasing empirical evidence suggesting that the competition implied by increased participation in international markets for inputs and outputs improves the productivity of firms.¹³ In brief, the main message from the international trade literature is that countries contemplating restricted linking options during a transitional period would be well advised to agree on a clear and renegotiation-proof exit strategy right at the start.

Article 6 of the Paris Agreement sets out general principles regarding the voluntary use of internationally transferred mitigation outcomes (ITMOs) toward the implementation of the Parties' nationally determined contributions. It also creates a mechanism to govern the cross-border movement of ITMOs among the Parties to ensure the environmental integrity of the system.¹⁴ It is essential that the countries from the

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region participate actively in the ongoing negotiations to flesh out this mechanism. The negotiations are likely to provide a valuable forum for knowledge exchange between those who have established carbon market linkages and those who are aiming for them in the future.

mutually beneficial, it may facilitate linkages among the countries of the region. At the same time, it will create a clear path to further integration when the region's linked carbon markets consider linkages with clubs of carbon markets emerging elsewhere, or with countries where alternative climate policy instruments are being deployed.¹⁵ This would constitute an important step toward the economist's Holy Grail, a globally uniform carbon price.

To the extent that the Parties to the Paris Agreement believe the mechanism that ultimately emerges from these negotiations is fair, effective, and

CONCLUDING THOUGHTS

Cost-effectiveness of climate change efforts will become increasingly important as policy ratchets up under the Paris Agreement. Carbon market linkages provide a powerful tool to deliver cost-effectiveness as well as other environmental and strategic benefits. Yet it is not a forgone conclusion that linkages will go ahead, even when they are mutually advantageous to all participating countries. Anticipation of economic and political barriers to linkage well in advance is crucial. Epistemic communities have an important role to play to dispel myths about linking but also to underline the real challenges that must be confronted head on. The best way to do this is by building a comprehensive and robust evidence base that documents the potential benefits of and barriers to linking carbon markets, both *ex ante* and *ex post*. While there is a growing body of primary academic research and policy literature on the topic, several unanswered questions remain. Many others will emerge as linked markets mature and new linkages are formed. Against this backdrop, it is essential to maintain an active and open dialogue between the members of the research community, carbon market practitioners, and policy makers.

ENDNOTES

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