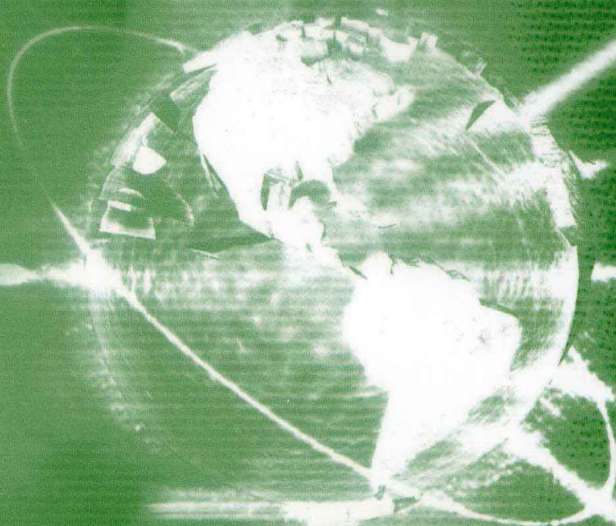


# The WTO, Subsidies and Countervailing Measures

Edited by  
Marc Bacchetta and Michele Ruta



Critical Perspectives on the  
Global Trading System and the WTO

# The WTO, Subsidies and Countervailing Measures

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CRITICAL PERSPECTIVES ON THE GLOBAL TRADING SYSTEM AND THE WTO

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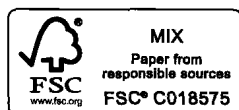
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# Introduction

*Marc Bacchetta and Michele Ruta*

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Subsidies are one of many policy instruments subject to rules in the multilateral trading system, but they present more complex issues for policy makers relative to other measures. One reason for this is that subsidies can be defined in different ways. Another is that they are used in pursuit of a wide array of trade or non-trade related objectives. For these reasons, the task of determining which sorts of subsidies are problematic from the perspective of the trading system, and what should be done about them, has occupied an important place in the academic and policy debate.

In the General Agreement on Tariffs and Trade/World Trade Organization (GATT/WTO) system, a countervailing duty is a 'special duty levied for the purpose of offsetting any subsidy bestowed directly or indirectly upon the manufacture, production or export of any merchandise' (GATT Article VI.3). Countervailing measures are imposed by governments to raise the domestic price of imported goods that are 'artificially' low in price because a foreign government affords an advantage to its producers in the form of a subsidy. Countervailing measures are allowed by the GATT/WTO rules, but their use is strictly disciplined.

This volume contains a series of major academic contributions to the literature on the economics of subsidies and countervailing duties, their role in trade agreements and their treatment in the GATT/WTO system. A close look at the welfare effects of subsidies and countervailing measures from an economic perspective is essential as it helps clarify the use of these policy tools by member governments and their economic rationale. Moreover, a careful economic analysis also helps highlighting the strengths and weaknesses of the current arrangement and provides an essential food for thought for further discussions on the efficient design of trade agreements.

This introduction offers a broad overview of these key contributions. We organized the literature into three Parts. Part I starts with a summary of the economic effects of different types of subsidies followed by a discussion of the economics of countervailing duties. Part II presents the economic rationale for subsidy and countervailing rules within trade agreements and discusses WTO disciplines and practices.

## **I. The Economics of Subsidies and Countervailing Duties**

### *The Economics of Subsidies in Open Economies*

Subsidies have been the subject of a large literature in economics. The first question to address is what constitutes a subsidy. While no common definition exists, most definitions entail a transfer from the government to a private entity. One common way of looking at subsidies from

an economic point of view is to focus on the final recipients of the subsidy (i.e. producers, consumers) or the aim of a subsidy (i.e. increase production, promote exports). In the ensuing discussion, we follow the latter approach. First we discuss production subsidies, that is, the government transfers contingent on the output level of a certain producer. Then we review the large literature on subsidies that have the goal of promoting exports of domestic firms. Finally, we consider key contributions that analyse subsidies to research and development (R&D), which are broadly defined as government transfers to firms contingent on investments (such as the ones in new technologies or scientific knowledge). The common ground of the articles included in this volume is that they focus on the role of subsidies in an open economy.

### I.A PRODUCTION SUBSIDIES

The classic papers of Bhagwati and Ramaswami (1963; Chapter 1) and Johnson (1965; Chapter 2) show that in the presence of domestic distortions, such as positive external economies in a specific sector, a production subsidy rather than a tariff is the optimal government intervention. The argument is a well-known application of the first-best principle. Domestic distortions create a divergence between the domestic price and opportunity cost. Both a tariff and a subsidy may offset such distortions, as they both result in larger domestic production; however, social welfare will be higher when a subsidy and not a tariff is used. The reason is that an import tariff affects both consumer and producer margins as it is equivalent to a production subsidy combined with a consumption tax. The advantage of the production subsidy as a tool to address domestic market distortions is weakened if the taxes required to finance the subsidy create their own distortions. However, these two fundamental contributions made a clear argument that governments should be allowed some discretion in setting production subsidies. We shall come back on this point in Section II.B when discussing rules on domestic subsidies within trade agreements.

### I.B EXPORT SUBSIDIES

A large body of literature that developed in the 1980s studies the role of export subsidies when markets are imperfectly competitive. While the traditional analysis of export subsidies under perfect competition showed that a country has no economic reason to implement such policy measures, the path-breaking work of Brander and Spencer (1985; Chapter 3) highlighted that when firms are large, governments have a strategic reason to subsidize exports. In fact, export subsidies may shift profits from a foreign oligopolist to a domestic one, thus increasing domestic national welfare (to the expenses of foreign welfare). In the Brander–Spencer model there are only two firms, a foreign and a domestic producer, that export a perfectly substitutable good into a third market. They show that when firms compete in quantities (Cournot competition), if the home government pays an export subsidy to the domestic producer, it allows the home firm to compete at a lower marginal cost than its foreign rival. Subsidization induces an expansion of domestic production and exports to the third market, which drive lower profits for the foreign producer and larger profits for the home firm.

While the Brander–Spencer result raised a large amount of attention in policy circles (it provided a justification for activist trade policy), the ensuing theoretical findings cast doubts on the strategic-trade theory as a positive analysis of export subsidies. The optimal export subsidy result was found to be dependent on some key assumptions of the model, namely the number of competitors in the market and their mode of competition.<sup>1</sup> First, Dixit (1984; Chapter



4) proved in a model à la Brander and Spencer (1985; Chapter 3) that an export subsidy continues to be the best policy from the perspective of the home government even if there are more than two competitors, but only so long as the number of domestic firms is not too large. Second, Eaton and Grossman (1986; Chapter 5) analysed a model of the Brander–Spencer type where firms compete in prices rather than quantities (Bertrand competition). In this setting, an export tax rather than an export subsidy is the optimal trade policy from the domestic perspective.

These findings highlight the difficulties in extracting general principles of conduct in subsidy policy. One aspect that seems particularly problematic is the detailed knowledge that policy makers need to acquire in order to efficiently intervene in international competition. For instance, if a government has the wrong belief that firms compete in quantities and offers an export subsidy, the country's welfare is actually reduced. Therefore, this information requirement should make governments refrain from offering subsidies. Chapter 6 by Maggi (1996), however, shows that this argument may have been overemphasized. This chapter studies subsidy policy when the government is uncertain about the mode of competition of oligopolistic firms. The model shows that, when policy makers can design (small) subsidies that encourage expansion of the domestic firms' productive base (such as investments in new plants), national welfare increases independently of the specific characteristics of the market. In other words, informational constraints may not necessarily prevent unilateral government intervention, but rather influence the shape that such intervention takes.

Finally, the further studies in this section show that export subsidies may be efficient when the government or customers face information problems and do not directly observe the quality of the goods sold in the market. As for export subsidies under imperfect competition (and complete information), the optimal policy is however contingent on specific aspects of the economic environment. Early studies look at the case where countries face 'reputation' problems. In this environment, promoting the exports of a high-quality sector may have a positive effect on other sectors. This argument was first made by Mayer (1984). If firms have to sustain costs to signal their quality to customers, export subsidies may be inefficient as they may lead to adverse selection problems. Namely, subsidies may lead to excessive entry of low-quality firms (Grossman and Horn, 1988; Chapter 7). Bagwell and Staiger (1989; Chapter 8) analyse a scenario where firms cannot sell at a price which reflects the quality of their product. If export subsidies can be designed to be contingent on observed quality, this helps producers overcoming informational barriers and, therefore, improves efficiency. Finally, Raff and Kim (1999; Chapter 9) provide a generalization by showing that the optimal export policy, whether a subsidy or a tax, depends on industry characteristics (i.e. the extent of competition in the market) and the signalling distortion. The latter calls for an export subsidy, while competition for an export tax. This implies that an export subsidy may be an optimal policy when information problems are large. However, as the signalling distortion disappears, an export tax might dominate as the socially optimal policy.

## I.C SUBSIDIES TO R&D

Up to this point we implicitly assumed that the technology that rival firms in international markets use is given. In practice this is obviously not the case and governments enact policies, such as subsidies to R&D, aiming at influencing producers' technology choices. As for export subsidies, one reason to provide subsidies to R&D may be to promote 'national champions'

(i.e. domestic firms that can be highly competitive in world markets). A second rationale for R&D subsidies may be to offset some form of market distortion, as we have seen for production subsidies, such as a positive domestic spillover of research activities onto other sectors of the economy.

The work of Spencer and Brander (1983; Chapter 10) focuses on the first rationale for R&D subsidies. They build a model where oligopolistic firms compete in a third market and invest in the innovation of their production process (i.e. the efficiency with which they produce, not the quality of the good they produce). In this environment, similarly to what we have seen for policies that promote exports, R&D subsidies may have a strategic role. Specifically, measures that induce domestic producers to adopt cost-efficient technologies improve firms' competitive position in international markets, leading to larger market shares and bigger profits – at the expense of foreign producers. Under the assumption that the foreign government does not subsidize research, such policy strategy unambiguously improves home welfare. This, however, ceases to be true when domestic and foreign governments enter an R&D subsidy war, as governments' policy may lead to excessive investment in innovation. In this case, one can show that a subsidy agreement can improve welfare (see Section II.B).

The previous model is based on some simplifying assumptions. First, it assumes away the uncertainty which is inherent in the process of innovation; second, it abstracts from the possibility that R&D investment by one firm has positive effects on other domestic or foreign producers. The article by Bagwell and Staiger (1994; Chapter 11) introduces uncertainty in the Spencer–Brander model, while Leahy and Neary (1999; Chapter 12) consider the case of externalities in research activities. Intuitively, the uncertainty in the result of R&D activities has the effect of lowering firms' incentives to innovate and thus provides a rationale for subsidizing innovation. The presence of research externalities also affects the results of the Spencer–Brander model. Leahy and Neary (1999; Chapter 12) show that the direction of change, however, can be quite complicated as it depends on the type of spillovers (local or international) and its interaction with the strategic trade effect discussed above.

### *The Economics of Countervailing Duties*

Countervailing duties are 'anti-subsidy' measures, in the sense that governments use them as a response to subsidized imports that harm their domestic industry. This section surveys the literature that analyses the welfare effects of countervailing duties and the economic rationale for using them. It shows that in the perfect markets case, countervailing duties typically have a negative effect on aggregate welfare in the country imposing them. Two main caveats to this proposition are examined. First, countervailing duties can improve the importing country's terms-of-trade. If the terms-of-trade gain from the duty is larger than the efficiency loss, there may be an aggregate welfare argument for the government to countervail. Second, countervailing duties may deter subsidization altogether and thereby confer benefits to producers in the importing country who must compete with subsidized goods in their export markets. Releasing the perfect markets assumption provides further aggregate welfare-based explanations for the use of countervailing duties. For example, in presence of wage rigidities in the domestic labour market, a subsidy can harm the importing country. This provides a second-best argument for introducing countervailing methods. The bulk of the recent literature however focuses on the case of imperfect competition in the product markets. With imperfect competition in the product

markets, countervailing duties can be used for 'rent extraction' which may provide a further argument for governments to use them.

#### I.D COUNTERVAILING DUTIES WHEN MARKETS ARE PERFECT

Sykes (1989; Chapter 13) examines the welfare effects of countervailing duties in partial equilibrium under all possible assumptions. He first shows that if a small importing country imposes a countervailing duty on a subsidized import product, this duty like any other duty unambiguously reduces welfare. If, however, the country is large enough, the duty lowers demand which depresses the world price of the product, mitigating the initial price increase in the protected market and reducing the price in the subsidizing country. If the country is large enough, the terms-of-trade gains could more than compensate the efficiency loss from the duty. Sykes then discusses reasons why the terms-of-trade gains argument should not be interpreted as a justification for the use of countervailing duties. First, the subsidizing government is likely to recognize that countervailing duties absorb part of the subsidy and may respond by curtailing or abolishing the programme. As the importing country gains from the subsidy, it would be worse off in the case where the market returns to the pre-subsidy equilibrium. Second, even if the subsidy remains in place, it would be difficult to assess the welfare effect of the countervailing duty. A considerable amount of information, on demand and supply, would be needed to measure and compare the size of the deadweight loss with the terms-of-trade gain.<sup>2</sup>

Feenstra (1986; Chapter 14) retains the assumption of perfect markets but examines the effects of subsidies and countervailing duties in a general equilibrium model. He shows that a countervailing duty can benefit the importing country even if it has no effect on the world price of the good. The essential ingredient of his model is that he has several goods which allow him to explore the effect of various patterns of substitution and complementarity between goods at home and abroad. In a model with three goods, Feenstra demonstrates that a countervailing duty imposed on one of two importables is welfare improving for the countervailing country if the two importables are complements in this country and substitutes in the exporting country or if they are stronger complements in the countervailing country than in the subsidizing country. The intuition of this result is that if the two goods are strong substitutes in the foreign country, the terms-of-trade gain on the countervailed good may be offset by the terms-of-trade loss on the other good.

#### I.E COUNTERVAILING DUTIES WITH MARKET IMPERFECTIONS

As we have seen in Section I.A, in the presence of imperfect competition, the exporting nation does not necessarily lose and the importing country does not necessarily gain from export subsidies. Spencer (1988a,b; Chapters 15 and 16) extends the analysis to countervailing duties in the context of capital or investment subsidies. The papers focus on the issue whether the chosen level of duty actually serves the purpose of offsetting a foreign subsidy so as to maintain the competitiveness of domestic firms. They also examine whether GATT/WTO-compatible countervailing duties would be sufficient to deter subsidies. Spencer (1988a; Chapter 15) shows that while the maximum duty allowed under GATT/WTO rules is just sufficient to offset a direct export subsidy, it is not necessarily sufficient to offset subsidies to the purchase of additional capital equipment. A set of sufficient conditions under which firms in the importing country will be hurt is developed. They depend on both the nature of the production function

in a subsidized firm and the magnitude of the subsidy. Spencer (1988b; Chapter 16) notes that the usefulness of a GATT/WTO-compatible countervailing duty as a deterrent is likely to depend mainly on a commitment by the importing country to countervail in an immediate and sure way.

The structure in Dixit (1984; Chapter 4), discussed in Section I.A, allows for simultaneous selection of export subsidies and possibly offsetting tariffs. As argued by Brander (1995), using the term 'countervailing' to describe simultaneously selected duties may be misleading. In practice, subsidies are applied first and they may possibly be countervailed later with a tariff. Chapter 17 by Collie (1991) considers this sequence of interventions to analyse the effects of retaliation on the profit-shifting argument for export subsidies. Collie (1991; Chapter 17) examines different cases and concludes that in practice the possibility of retaliation with a countervailing tariff is sufficient to eliminate the foreign country's incentive to use an export subsidy. Collie (1994; Chapter 18) extends Collie (1991; Chapter 17) by allowing the timing of trade policy interventions to be explained by the model. Collie shows that the home government will always prefer to set its trade policy before the foreign government. This results in the home government committing not to use countervailing duties which leads the foreign firm to use a larger export subsidy because using a countervailing duty is no longer a credible threat. Consequently, both countries are better off. The domestic market benefits from the foreign export due to its impact on consumer surplus and the foreign firm benefits from a lower tariff regime. The conclusion is that imperfect competition does not provide an economic rationale for countervailing duties.

Qiu (1995; Chapter 19) also examines whether and how retaliation by a domestic country can efficiently reduce the profitability of export subsidization in a duopoly model. His analysis differs from that of Collie (1991; Chapter 17) in that he assumes that there can be no countervailing duty if there is no subsidy and that there can be a delay between the imposition of the subsidy and retaliation. Qiu (1995; Chapter 19) demonstrates that free trade is almost always the optimal trade policy in face of likely retaliation but that a foreign country may find subsidizing exports attractive when retaliation by the domestic country is extremely slow. Qiu also shows that the GATT/WTO constraint (i.e. a countervailing duty cannot exceed the amount of the subsidy) lessens the punishment and gives more room for export subsidization.

While most of the literature has focused on the case of imperfect product markets, imperfections in the labour market may also, at least theoretically, justify countervailing duties. Sykes (1989; Chapter 13) presents theoretical arguments in favour of using countervailing duties as a second-best response to adjustment costs and distributional effects resulting from subsidized imports. The efficiency-based argument rests on the assumption that workers earn a rent in the sense that they are paid more than the competitive wage. In this case, the effect of a foreign subsidy is no longer unambiguously beneficial. This is because part of the reduction in producer surplus resulting from the subsidy is not compensated by an increase in consumer surplus. In this environment, there can be cases where a countervailing duty may be welfare enhancing.

### *Empirical Analysis*

#### **I.F THE EFFECTS OF SUBSIDIES**

While there is a large theoretical literature on the economics of subsidies, few articles have analysed the effects of these policy measures. Part of the reason may indubitably be attributed

to the lack of transparency and availability of precise subsidy data. This is unfortunate as several questions that are raised by the theoretical literature can only be effectively addressed with careful empirical studies. In this section, we include two examples of such analyses. The first, by Rodrik (1995; Chapter 20) studies the effectiveness of export subsidies in different regions, while the second by Irwin and Pavcnik (2004; Chapter 21) documents the effects of limiting subsidies in the aircraft industry.

As we have seen in Section I.A there are several reasons to doubt that export subsidies may effectively increase national welfare, as the predictions of the Brander–Spencer model are weakened, or even reversed, by small alterations of its basic assumptions. An even more basic question, however, is to understand whether export policies are effective, that is if subsidizing exports achieves the goal of expanding exports. If this were not the case, quite obviously, no positive effect on national welfare can be expected. The work of Rodrik (1995; Chapter 20) compares successful export subsidization in Brazil and Korea, failures in promoting exports in Bolivia and Kenya and the mixed experiences of India and Turkey. According to Rodrik (1995; Chapter 20), two key elements may help explaining these contrasting findings: policy coherence, that is the consistency of the export programmes with the broader policy priorities, and state autonomy, that is the ability of shielding the government from special interests' requests.

The aircraft industry offered to economists a real-world application of a classic textbook example of strategic trade policy. First, the market for large aircrafts is oligopolistic, essentially a duopoly. Second, governments have on several occasions and in different forms subsidized their industries. What are the effects of subsidies on international competition? The work of Irwin and Pavcnik (2004; Chapter 21) addresses this question in reverse, as they study the effects of an international agreement which limits subsidies to infer the effects of subsidization of domestic industries. They find that government subsidies do affect international rivalry in the civil air transport market. Namely, they estimate that the effect of the 1992 agreement to limit civil aircraft subsidies between the United States and the European Union resulted in a 3.7 per cent increase in final prices and a 5 per cent increase in firms' marginal costs.

## I.G THE EFFECTS OF COUNTERVAILING MEASURES

Most of the empirical literature on countervailing duties (CVDs) analyses US countervailing law. There are several reasons for this. First, countervailing duties seem to be an American invention which can be dated back to the late nineteenth century (Congressional Budget Office, 1994). Second, the United States have not only been an early user of CVDs, they have also been their main user. Third, detailed data on US CVD cases is easily available. While the early literature was mainly concerned with the determinants of countervailing actions, the more recent literature focuses on the effects of CVDs. The reader interested in empirical work on CVDs should also refer to the empirical literature on antidumping (AD; see Bown, 2006). Most if not all empirical work that examines CVDs also covers AD, while the opposite is not true. Empirical AD work is thus much richer. Moreover, when AD and CVD cases are analysed, the effect of CVDs can often not be distinguished from that of AD measures.

Finger *et al.* (1982; Chapter 22) provide econometric evidence supporting their idea that the function of administrative import restraint mechanisms in the United States is to resolve or defuse complaints about import competition. They develop a theory of how the mechanisms work and deduce operational implications from the theory which they test empirically over the

record of countervailing duty, antidumping and escape clause cases decided by the United States administration from 1975 to 1979. The empirical analysis shows that technical factors determine the outcome of CVD and AD cases. This confirms the technical nature of the CVD and AD determinations, which contrasts with the more political nature of the escape clause. Going one step beyond, Hansen (1990; Chapter 23) explores the factors that affect the demand for and the supply of trade protection for US industries and demonstrates that industries self-select themselves in applying for protection from the US International Trade Commission (ITC). The main result is that industries base their decisions to apply or not on their perception of the maximum expected utility of being granted protection by the ITC. In other words, the industries that believe their requests will probably be rejected will not bother to apply. Further, the likelihood of industries being granted protection, given that they applied, seems to depend less on economic need and more on political factors.

Still using empirical evidence on AD and CVD cases from the United States, Leidy (1997; Chapter 24) examines whether there is a link between macroeconomic conditions and pressures for protection through AD and CVD. The measure of protectionist pressures under CVD/AD used as the dependent variable in the regressions is the yearly number of petitions for AD and CVD in the United States over the period 1980 to 1995. The two indicators of macroeconomic activity used as explanatory variables are the unemployment rate and the rate of industrial capacity utilization. Results indicate that the number of petitions responded in a statistically significant way, to the state of domestic macroeconomic activity. Fewer petitions were initiated when the unemployment rate was low and the rate of capacity utilization was high.

Gallaway *et al.* (1999; Chapter 25) is the first paper presenting an estimate of the net economic welfare cost of US AD/CVD law using a Computable General Equilibrium (CGE) model. The main contribution of the paper is to propose solutions to overcome difficulties that significantly complicate the use of CGE modelling to analyse AD/CVD actions, such as that AD/CVD actions are typically targeted at narrowly defined product categories while CGE models specify sectors at a very aggregate level, or that the nature of AD orders and the fact that they can change over time presents a modelling challenge. The authors find that the cost of AD/CVD laws (about US\$4 billion) was larger than that of any other US import restraint programme in place in 1993 except the Multifiber Arrangement restrictions. The magnitude of the impact is due not only to the number of AD/CVD orders, but also to the structure and administration of these orders.

## II. Law and Economics of WTO Subsidy and Countervailing Disciplines

### II.A INSTITUTIONS AND HISTORY

Part II of this book deals more closely with subsidy agreements in the world trading system. The first three papers set the stage by analysing the key institutional features of the WTO rules on subsidies and countervailing measures from a legal perspective. The classic work of Jackson (1997; Chapter 26) deals with substantive issues on subsidies, such as the legal definition of what constitutes a subsidy, the landscape of national and international rules that affect subsidization in international trade, and the evolution of such norms from the GATT system to the WTO. The second article by Sykes (2005; Chapter 27) critically revisits the legal framework of subsidy and countervailing disciplines under the GATT and the WTO Agreement on

Subsidies and Countervailing Measures (SCM) from an economic perspective. This chapter also briefly touches on the treatment of subsidies in the Agriculture Agreement. The issue of WTO rules on subsidies in the service sector is addressed in Gauthier *et al.* (2000; Chapter 28). While the possibility that subsidization may have distorting effects on trade in services is acknowledged in the GATS (General Agreement in Trades in Services) Agreement (Article XV), subsidies in services remain essentially unregulated and this article deals with how subsidies might eventually be treated in GATS.

### *The Economics of Subsidy Agreements*

What are the effects of subsidy rules? Why do governments sign subsidy agreements? How should such agreements be designed from an efficiency point of view? What is the rationale of countervailing duties in trade treaties? This section reviews the key contributions in the economic literature that address these questions. We divide the discussion into three groups of articles. The first set of papers, Bagwell and Staiger (2002; Chapter 29) and Leahy and Neary (2009; Chapter 30), focuses on export and R&D subsidies and analyses subsidy agreements *per se* (i.e. it transcends beyond the role of subsidy rules within broader trade treaties). The second group, Bagwell and Staiger (2006; Chapter 31) and Horn *et al.* (2010; Chapter 32), instead studies rules on domestic production subsidies within trade agreements. The two, therefore, represent complementary analyses both in terms of the policy they examine and the questions they address. Finally, the last group of articles – Grossman and Mavroidis (2003; Chapter 33) and Horn and Mavroidis (2003; Chapter 34) – deals with the economic rationale of countervailing disciplines in trade agreements.

### II.B SUBSIDY AGREEMENTS

Let us begin with models that focus on subsidies only. Bagwell and Staiger (2002; Chapter 29) consider competitive producers located in two countries that export a homogeneous good into a third market. If a government of one of the two exporting countries offers an export subsidy to its producers (for instance as a response to domestic lobbying pressures), the effect of this measure is to lower the world price. This, in turn, implies a negative effect on the other exporting country, as sellers export the good at a lower price, and a positive effect on the importing country, whose consumers pay less for their imports. In this environment, an agreement that limits or bans export subsidies may benefit exporters and hurt importers. Lower subsidies reduce the volume of world trade and sustain a higher price, which boosts the export industry profits and lowers consumer surplus. This approach, therefore, provides little normative support to the prohibition of export subsidies in the SCM Agreement and for rules that restrict the use of agricultural export subsidies.

Chapter 30 by Leahy and Neary (2009) assumes oligopolistic competition, much in the spirit of the strategic trade literature analysed in Section I.A, and focuses subsidies to R&D. In this context, unilateral government policies may have a positive and a negative effect on trading partners. R&D subsidies can be used as an instrument of strategic trade policy, but at the same time, they may improve foreign welfare if there are cross-border spillovers in R&D investments. As, in the absence of a subsidy agreement, governments act unilaterally, they will disregard the effects of their policies on their trading partners. This, however, is not always bad from the point of view of global welfare, precisely because subsidies to R&D can have both positive

and beggar-thy-neighbour effects. The model, therefore, predicts when an agreement that bans subsidies may move the global economy towards efficiency relative to the situation where governments uncooperatively set their policy. Leahy and Neary find that whether a subsidy agreement is efficient or not depends on several factors such as the size of cross-border R&D externalities and the extent of market competition.

## II.C SUBSIDY RULES IN TRADE AGREEMENTS

We turn now to the analysis of subsidy rules within trade agreements. As we have discussed in Section I.A, a production subsidy may be a first-best policy measure when the domestic economy suffers some form of market imperfection (such as a positive externality of one sector on the rest of the economy). This argument implies that, at least in the presence of domestic distortions, an international trade treaty should leave scope for flexibility to governments in their choice of production subsidies. This simple logic, however, fails to acknowledge the reason why a trade agreement is signed in the first place. In the standard approach (Bagwell and Staiger, 1999), the rationale for a trade agreement is to help governments internalize an international externality (the terms-of-trade externality). This is important as, once tariffs have been committed through a trade treaty, production subsidies can be used by governments to undo those commitments (and exploit the terms-of-trade externality). This provides a rationale for rules that limit government flexibility in their subsidization decisions.

The work of Bagwell and Staiger (2006; Chapter 31) argues that a subsidy agreement needs to strike a balance between the benefits of government flexibility in setting subsidies to offset domestic distortions and the costs of using subsidies for uncooperative behaviour on the international arena. Importantly, they argue that rules on domestic subsidies in the WTO system (see Section II.A) may have gone too far in the sense of limiting discretion. More precisely, Bagwell and Staiger (2006; Chapter 31) formally show that rules that are excessively restrictive may end up having a 'chilling effect' on trade negotiations. That is, if a government values flexibility, but the agreement constrains its use of subsidies, then the government may not be willing to accept a tariff cut in order to maintain an instrument (even if a second-best one) to address domestic market distortions. For this reason, the authors are critical of the increased rigidity of domestic subsidy disciplines introduced with the SCM Agreement.

While this study is quite sceptical about the design of rules on domestic subsidies within the WTO, the article by Horn *et al.* (2010; Chapter 32) provides a more positive outlook. In their paper, the trade agreement is an endogenously incomplete contract, in the sense that governments decide what policy to regulate in the agreement as the result of a trade-off between the benefits of a more detailed contract and the costs associated with writing it (transaction costs). The rationale for subsidy rules that emerges from this approach is to limit the policy substitutability between tariffs and subsidies.<sup>3</sup> In other words, allowing subsidy flexibility when tariffs are committed leaves open the door to (inefficient) terms-of-trade manipulation. The theory therefore suggests that the agreement should be more rigid on the use of domestic subsidies the more a country has the ability to exploit the terms-of-trade externality and the more substitutable are tariffs and subsidies as tools to manipulate the terms-of-trade.

## II.D COUNTERVAILING DISCIPLINES IN TRADE AGREEMENTS

The chapter by Grossman and Mavroidis (2003; Chapter 33) views the role of countervailing duties in trade agreements from the point of view of economic theory.<sup>4</sup> As discussed earlier,



according to the standard theory, the rationale of a trade agreement is to reciprocally eliminate beggar-thy-neighbour policies, and countervailing duties serve the purpose of imposing costs on a government that chooses to use subsidies. As we have seen, however, the negative externality imposed by the subsidy does not necessarily correspond to a loss of aggregate economic welfare. If the presumption is that the negative externality imposed by the subsidy does not typically correspond to a loss of aggregate economic welfare but only to a loss of producer surplus, the rationale for countervailing duty law should be seen as to protect an entitlement of domestic producers from the harmful effects of foreign subsidies rather than to promote global efficiency.

As pointed out by Grossman and Mavroidis (2003; Chapter 33), this interpretation finds support in a number of provisions of the SCM Agreement. If countervailing duties served the purpose of neutralizing subsidies that inflict a welfare loss on trading partners, then their application should be sanctioned only for cases in which a subsidy can be shown to have this sort of negative spillover. As discussed below, however, the SCM Agreement confines the use of countervailing duties to situations where the importing country can provide evidence that an industry has been injured by subsidized imports.

Similarly, Horn and Mavroidis (2003; Chapter 34) argue that governments plausibly do not maximize national social welfare but rather put more weight on the well-being of certain groups, such as the import-competing industry. Under this assumption, countervailing duties can be seen as instruments that allow importing countries to neutralize negative externalities from subsidies. As demonstrated in the literature discussed above, the government of an importing country can set countervailing duties so as to restore the price prevailing in the absence of a subsidy, thereby leaving domestic consumers and producers unaffected by the subsidy. In the process however it collects tariff revenue which makes it better off than before the subsidy.

Chapter 13 by Sykes (1989), that we already encountered in Section I.B, discusses the argument that countervailing duties may be part of a larger multilateral system aimed at discouraging trade-distorting subsidies and at facilitating trade concessions. He observes that a system of constraints upon subsidies can only be effective if it is properly enforced. He suggests that countervailing duties may be part of the enforcement mechanism. While Sykes is aware that, in a narrow sense, countervailing duties are often detrimental to national economic welfare, his view is that there might nevertheless be systemic gains from the use of countervailing duties by all countries. On the one hand, the threat of countervailing duties abroad may allow governments to resist political pressures for wasteful subsidization at home, on the other, the use of countervailing duties by all countries may deter subsidies that would otherwise injure each nation's exporters in their overseas markets. Sykes (1989; Chapter 13) also notes that countervailing duties are unlikely to be very useful as a means to enforce international constraints on subsidies unless the duties are imposed multilaterally. This is because countervailing duties imposed by a single country are likely to deter subsidization by other governments only haphazardly and not necessarily when such deterrence is most likely to improve the welfare of the country that imposes the duty.

## II.E AN ECONOMIC PERSPECTIVE ON WTO CASE LAW

The last articles analyse the case law from the adjudicating bodies of the WTO on disputes related to subsidies and countervailing measures. These studies contain both an economic and a legal analysis of the trade disputes and provide a useful contribution to understanding the