World Trade Review (2017), 16: 2, 371–394
 doi:10.1017/S1474745616000586

US–COOL Retaliation: The WTO's Article 22.6 Arbitration

CHAD P. BOWN*
Peterson Institute for International Economics & CEPR
RACHEL BREWSTER**
Duke Law School

Abstract: This paper examines the World Trade Organization's Article 22.6 arbitration report on the dispute over the United States' country of origin labeling (US–COOL) regulation for meat products. At prior phases of the legal process, a WTO Panel and the Appellate Body had sided with Canada and Mexico by finding that the US regulation had negatively affected their exports of livestock – cattle and hogs – to the US market. The arbitrators authorized Canada and Mexico to retaliate by over $1 billion against US exports – the second largest authorized retaliation on record and only the twelfth WTO dispute to reach the stage of an arbitration report. Our legal–economic analysis focuses on several issues in the arbitration report. First, the complainants requested that, to compute the permissible retaliation limit, the arbitrators consider a new formula that would include the effects of domestic price suppression. We present a simple, economics-based model to explain the arbitrators' rejection of this proposal. Second, we provide market context for the $1 billion finding. The arbitrators relied on the trade effects' formula, which sets the retaliation limit as equivalent to the perceived loss of export revenue from the WTO violation. We argue that this amount was implausibly large, given the conditions in the US market for cattle and hogs during this period. We then describe the challenges facing arbitrators as they construct such estimates, including those likely to have arisen in this dispute.

1. Introduction

This paper examines the Article 22.6 arbitration report of the WTO dispute over the United States' country of origin labeling (*US–COOL*) regulation for meat products, and the concerns that Canada and Mexico raised that their livestock exports to the US market had been negatively impacted by the US regulation. The Article

* Email: cbown@piie.com
** Email: Brewster@law.duke.edu
The authors acknowledge useful discussions with Jennifer Hillman, Jorge Huerta-Goldman, Petros Mavroidis, and participants at the European University Institute's WTO Case Law of 2015 Conference. All remaining errors are our own.

22.6 arbitrators determined that Canada and Mexico combined should be allowed to impose tariffs on roughly $1 billion of US exports annually. However, the US repealed the *COOL* regulation before the Dispute Settlement Body (DSB) authorized the retaliation. As a result, Canada and Mexico have not applied retaliation, although both countries sought and received the DSB's formal authorization to do so.

The *COOL* saga is a long one. Congress passed the original country of origin labeling legislation in 2002, though it was defunded by Congress and thus could not be implemented as a regulation until 2008, at the very end of the Bush administration. The legislation and regulation demanded that unprocessed beef and pork products sold directly to US consumers have labels stating where the animal was born, raised, and slaughtered. Canada and Mexico argued that this regulation made it costlier for US meatpackers – most of whom slaughtered US-raised cattle and hogs – to also slaughter cattle or hogs from Canada and Mexico relative to meatpackers who handled only US animals. Canada and Mexico filed a dispute in 2008, requested a panel in 2009, and the Panel issued its report in 2011, siding with the complainants. The United States appealed, and the Appellate Body Report was issued in 2013. The United States attempted to comply with the Panel and Appellate Body Reports by reforming the COOL regulation, but the compliance Panel and later the Appellate Body rejected the modified regulation. At that point, Canada and Mexico sought the right to retaliate against the United States, and an Article 22.6 arbitration Panel was established.

The substantive legal issues involved in *US–COOL* – about the alleged discriminatory nature of the US consumer product labeling requirement – were similar to those of a number of recent WTO disputes regarding national or regional regulations for labeling or standards for animal, plant, or human health products under the WTO Agreements on Technical Barriers to Trade (TBT) and on Sanitary and Phytosanitary (SPS) measures.[1] Prior research has already examined the WTO judiciary's legal treatment of the issues in the *US–COOL* dispute, including Howse and Levy (2013) for the Panel Report and Mavroidis and Saggi (2014) for the Appellate Body Report. We point the interested reader to those analyses for a more comprehensive assessment of the dispute, Panel, and Appellate Body Reports; the only additional point worth noting here is that we are in broad agreement with the Mavroidis and Saggi (2014) critique of the earlier decisions in this case.

1 Other legal–economic assessments of related disputes under this 15-year project are Horn and Weiler (2003), *EC–Asbestos*; Neven and Weiler (2006), *Japan–Apples*; Howse and Horn (2009), *EC: Approval and Marketing of Biotech Products*; Bown and Trachtman (2009), *Brazil–Retreaded Tyres*; Hoekman and Trachtman (2010), *EC–Hormones*; Bown and Hillman (2016), *India–Agricultural Products*; Crowley and Howse (2014), *US–Tuna II*; Broude and Levy (2014), *US–Clove Cigarettes*; and Levy and Regan (2015), Conconi and Voon (2016), *EC–Seal Products*.

The analysis presented in this paper focuses on the Article 22.6 arbitration report, which is important, first, because it concerns only the twelfth WTO dispute to have reached such arbitration. Table 1 lists the earlier WTO disputes to have reached the issuance of such reports as well as prior research on them. Second, this arbitration is especially important to analyze because the authorized retaliation – roughly US $1 billion collectively for Canada and Mexico – was so sizable. Indeed, as table 1 also shows, this is the second largest authorized retaliation, following the *US–FSC (EC)* dispute in which the European Commission was authorized to retaliate over more than $4 billion annually.

The main purpose of any Article 22.6 arbitration is to determine the upper limit – or the amount of bilateral trade – over which the complainant country is authorized to impose retaliatory import tariffs in the event that the respondent does not comply with the earlier WTO decisions. Our analysis centers on two economic issues that are key to any Article 22.6 arbitration report: the choice of formula for determining the upper limit to the authorized retaliation, and the procedure used to estimate the variables required to implement the chosen formula.

On formula determination, prior arbitration reports have been described as resulting in one of two basic approaches: the 'trade effects' formula and the 'subsidy' formula (Bown and Ruta, 2010).[2] The complainants in *US–COOL* requested that the arbitrators consider adopting an alternative formula that would also include the effects of potential domestic price suppression associated with the US regulation. The arbitrators rejected this alternative formula and followed the pattern established by earlier disputes in relying on the trade effects formula. We provide a simple, economics-model-based explanation for the rejection of the alternative proposal.

Once the arbitrators decide on a formula, they must determine how to implement it, including the establishment of 'counterfactual' values – i.e., states of the world that were not observed – for some of the formula's key parameters. Thus, implementation of the formula is dependent on case- and market-specific considerations. Our view is that the arbitrators authorized a retaliation amount that was implausibly large, given the US market conditions for cattle and hogs at the time.

It is impossible for outsiders to disentangle exactly what it was in the arbitrators' chosen model – and which of the counterfactual parameters they used – that led to their estimate that such a large retaliation amount was appropriate. We suggest some likely contributing explanations. We also describe how, in their modeling approach, the arbitrators had to address the especially challenging economic conditions in this market and period.

2 The subsidy formula had been implemented in disputes arising under the Agreement on Subsidies and Countervailing Measures, such as *Brazil–Aircraft (Canada)*, *US–FSC (EC)*, *Canada–Aircraft Credits and Guarantees (Brazil)*, and *US–Upland Cotton (Brazil)*. This formula was not relevant for *US–COOL* dispute as the current case did not involve the SCM Agreement.

Table 1. WTO disputes resulting in retaliation decisions by Article 22.6 arbitrators

Year of report	Dispute		Key provisions	Award by the arbitrators[a]	Retaliation research
1999	DS27	*EC–Bananas III (US)*	GATT Article XIII	$191.4 million	Bown (2002) Bown and Ruta (2010)
1999	DS26	*EC–Hormones (US)*	SPS Agreement	$116.8 million	Bown (2002) Bown and Ruta (2010) Bernstein and Skully (2003)
1999	DS48	*EC–Hormones (Canada)*	SPS Agreement	CAN $11.3 million	Bown (2002) Bown and Ruta (2010) Bernstein and Skully (2003)
2000	DS27	*EC–Bananas III (Ecuador)*	GATT Article XIII	$201.6 million	Bown (2002) Bown and Ruta (2010)
2000	DS46	*Brazil–Aircraft* (*Canada*)	GATT Article XVI, SCM Agreement	$344.2 million	Bown and Ruta (2010)
2002	DS108	*US–FSC (EC)*	SCM Agreement	$4.043 billion	Howse and Neven (2005) Bown and Ruta (2010)
2003	DS222	*Canada–Aircraft Credits and Guarantees (Brazil)*	SCM Agreement	CAN $247.797 million	Bown and Ruta (2010)
2004	DS136	*US–1916 Act (EC)*	GATT Article VI, Antidumping Agreement	No specific amount, but related to size of any potential damage payments EC firms have to pay arising under 1916 Antidumping Act	Howse and Staiger (2006) Bown and Ruta (2010)
2004	DS217	*US–Offset Act (Byrd Amendment) (Brazil, Canada, Chile, EC, India, Japan, Korea, Mexico)*	GATT Article VI, Antidumping Agreement, SCM Agreement	0.72 * value of payments made the prior year under the Continued Dumping and Subsidy Offset Act of 2000	Bown and Ruta (2010)
2007	DS285	*US–Gambling* (*Antigua and Barbuda*)	GATS Article XVI	$21 million	Bown and Ruta (2010)
2009	DS267	*US–Upland Cotton* (*Brazil*)	GATT Article XVI, SCM Agreement Agreement on Agriculture	Annual formula computed and applied based on size of continued US subsidy	Grossman and Sykes (2011)
2015	DS384	*US–COOL (Canada)*	TBT Agreement	CAN $1.054 billion[b]	
2015	DS386	*US–COOL (Mexico)*	TBT Agreement	$227.758 million	

Note: (a) Unless stated otherwise, $ denotes current US dollars.
(b) Roughly $805 million.
EC = European Community; FSC = Foreign Sales Corporations; GATS = General Agreement on Trade in Services; GATT = General Agreement on Tariffs and Trade; SCM = Subsidies and Countervailing Measures; SPS = Sanitary and Phytosanitary; TBT = Technical Barriers to Trade.

Because the arbitrators are transparent in their report, we are able to raise these systemic points about the difficulties of constructing an accurate counterfactual and to consider whether these difficulties should trigger a significant rethinking of how arbitrators approach this aspect of their work. What should be done in cases when there is substantial uncertainty about the precision of counterfactual parameter estimates? The precision of such estimates matters because different values can lead to wildly divergent amounts of permissible trading partner retaliation.

This paper proceeds as follows. Section 2 briefly reviews the economic market at stake, the US country of origin labeling regulation, and the timeline of the earlier phases of the WTO dispute. Section 3 focuses on the first of the two main issues in the arbitration – the formula to be used to determine the authorized amount of retaliation. Section 4 highlights key elements of the second issue of formula implementation. Section 5 concludes.

2. Background: regulation, dispute, and trade

2.1 The United States COOL regulation and earlier phases of the WTO dispute

The US country of origin labeling legislation was introduced via the 2002 Farm Bill, which required that several agriculture goods, including beef, pork, nuts, and shellfish, be labeled with their source country. Inclusion of the COOL requirement in the 2002 Farm Bill was a legislative victory for the segment of US farming groups – as well as consumer rights groups – that had advocated for such labeling. The statute established a three-tier 'born, raised, and processed' system of identifying the source of beef and pork. Only animals that were born, exclusively raised, and slaughtered in the United States were eligible for the US origin label.

However, the 2002 COOL legislative victory was undermined when opponents of the legislation were able to defund the implementation process, delaying implementation for six years. The statute did not specify who would collect the country-of-origin information, how the label would be structured, what types of goods would be subject to the labeling, and how the system would be monitored and enforced. These issues were left to the US Department of Agriculture's (USDA) rule-making process. At the very end of the Bush administration's term in 2008, the USDA published the first version of the COOL regulations. They permitted a mixed-origin label and disappointed COOL proponents. Even COOL opponents concurred that the rule was the most relaxed regulation possible.

With the arrival of the Obama administration in 2009, regulators became more receptive in their attempts to implement the spirit of the original COOL legislation. The new head of the USDA, Tom Vilsack, on implementing the rule, issued a non-binding letter stating that meatpackers should not use the mixed-origin label if the slaughterhouse processed only US-born, -raised, and -slaughtered meat in one 24-hour period. The letter also noted that the mixed-origin label was not intended

to apply to the majority of products eligible for the US-born, -raised, and -slaughtered label (see Greene, 2015: 5).

Shortly before the final COOL rule was implemented, the Canadian and Mexican governments filed a request for consultations at the WTO in December 2008 and June 2009 respectively, and both countries requested a panel in October 2009. The subsequent Panel Report and Appellate Body Report found that the COOL regulation breached the TBT agreement by offering less favorable treatment to foreign goods (Howse and Levy, 2013; Mavroidis and Saggi, 2014). In July 2012, the DSB adopted the Appellate Body's Report.

The WTO decisions required the US government to revisit the COOL rule. Instead of simply repealing it, and to address the concerns raised by the decisions, the United States issued a new and stricter COOL regulation and notified the DSB in May 2013 that it was 'in compliance'. The option of the mixed-origin label was eliminated, thus providing more information to consumers as an attempt to address the appellate body's concern that information gathered upstream was not being communicated to consumers, and thus that the costs were not justified in terms of greater consumer information. The new labeling scheme identified where the animal had been born, raised, and slaughtered.

Canada and Mexico disagreed that the US's new COOL regulation was consistent with WTO law and requested a compliance panel in August 2013. In October 2014, the compliance Panel found that the US policy was still WTO-inconsistent. The United States again appealed, and lost in an Appellate Body decision issued in May 2015. Canada and Mexico announced their intention to suspend concessions for the United States and, in June 2015, the latter requested an Arbitration Panel to adjudicate the appropriate level of retaliation.

The Arbitration Panel issued its decision on 7 December 2015, and the DSB adopted the report on 21 December. The United States ultimately repealed the COOL regulation through an omnibus bill passed by Congress on 18 December and signed into law by President Obama the same day. Thus, the US government repealed COOL before the DSB officially authorized retaliation on 21 December 2015.

2.2 *The United States' import market for livestock*

The North American livestock market has become increasingly integrated since the implementation of first the Canada–US Free Trade Agreement (CUSFTA) in 1988 and the North American Free Trade Agreement (NAFTA) in 1994. As bilaterally applied tariffs on livestock (cattle and hogs) and other non-tariff barriers have fallen, there have been changes to the patterns in live animal shipments across borders in the more integrated North American beef and pork supply chains.[3] Firms and industries have reorganized regionally across North America, and trade in 'new' animal products – e.g., livestock of different ages – has emerged to

3 For a more complete description, see Greene (2015).

exploit differences in comparative advantage, economies of scale, and tastes and preferences. Overwhelmingly, trade in live animals has tended to move cattle and hogs from Canada and cattle from Mexico to the US market for processing into beef and pork products for consumption.

Figure 1 illustrates the US import market for cattle and hogs from 1989 to 2015, based on public data provided by the US government. Note that, in nominal terms, the combined value of these US imports rose from $800 million in 1989 to $2.5 billion by 2007. In August 2008, the *US–COOL* regulation was implemented via an interim rule and then in January 2009 with a final rule. By 2009, US imports had fallen to about $1.7 billion.

Shortly thereafter Canada and Mexico filed WTO disputes, and the COOL regulation remained in place through 2015. In 2015, Canada requested $2.4 billion[4] (CAN$3.1 billion) in retaliatory compensation and Mexico $713 million. The arbitrators granted Canada $805 million (CAN$1.054 billion) and Mexico $227.8 million, or a combined $1 billion in compensatory retaliation. Again, for perspective, prior to the COOL regulation, annual US imports of cattle and swine from Canada and Mexico were never more than $2.5 billion. In 2014, US imports reached $2.9 billion – despite the COOL regulation.

Next, consider Figure 2, which illustrates the US import *volumes* of cattle and hogs from each of its two major foreign sources. The United States imports substantial volumes of cattle from both Canada and Mexico. The total volume of cattle imports is relatively flat since at least in the mid-1990s, averaging around 2.1 million head per year, although this average masks considerable fluctuations in bilateral volumes on a year-to-year basis.

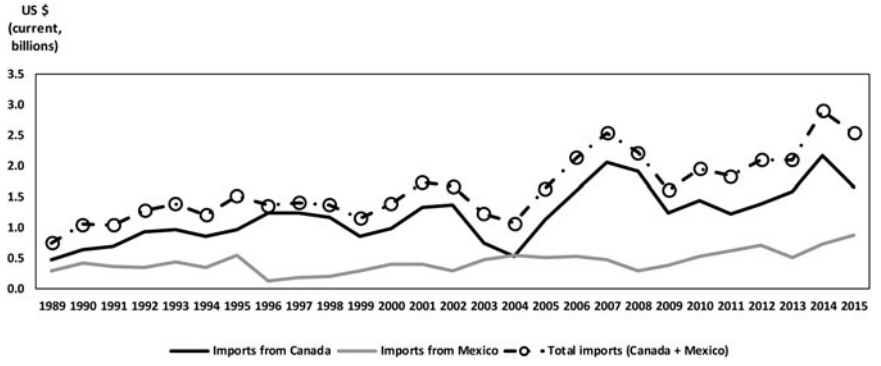
There are many apparent sources for the annual volatility in the bilateral volumes, some of which are associated with major shocks that have nothing to do with the COOL regulation. For example, in 1995 Mexico's exports plummeted in response to the peso crisis. In 2003, Canada suffered an outbreak of bovine spongiform encephalopathy (BSE) that resulted in a US import ban on the country's cattle until 2005.[5] In 1998, the United States initiated antidumping and countervailing duty investigations against Canada and an antidumping case against Mexico, and it is not uncommon for such cases to have a chilling effect on bilateral trade volumes.[6] In other years during this period, Mexico experienced droughts

4 Unless stated otherwise, $ refer to US dollars. Amounts reported in Canadian dollars are denoted CAN$. For context, Bown and Reynolds (2015) provide information on the average amount of bilateral trade in disputed products at stake in WTO disputes over 1995–2011.

5 Later in 2003, the US experienced its own first reported case of a BSE outbreak, and this led to a massive decline in US exports of beef globally that bottomed out in 2004.

6 In 1998, the US initiated antidumping and countervailing duty investigations against imports of cattle from Canada and an antidumping investigation against imports of cattle from Mexico. The case against Mexico ended with a negative injury determination in the preliminary stage. Preliminary duties of 4.73% were applied against imports from Canada in July 1999 but refunded after the November 1999 negative final injury determination by the USITC (Bown, 2015).

Figure 1. US import values of products subject to the US–COOL dispute, 1989–2015



Source: Constructed by the authors with data from the USITC's Dataweb.

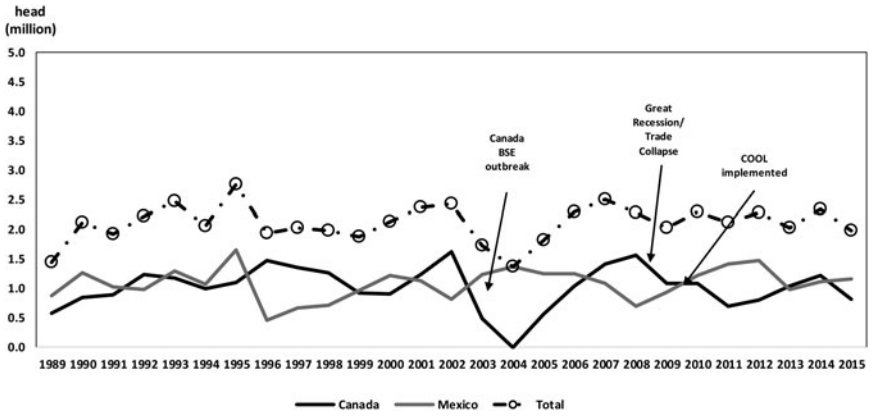
and Canada shut down domestic slaughterhouses, both of which exogenously increased the supply of exports of live animals to the US market. Furthermore, this figure also does not capture likely changes in the types of cattle (of different ages) being traded as the North American industry was developing into a relatively more efficient regional supply chain. Overall, the main point to keep in mind is that several factors shifted US import demand as well as Canada's and Mexico's export supplies for cattle during this period.

Figure 2 also shows why the timing of the imposition of the US interim and final COOL regulations was important. Beginning in summer 2008, US trade flows *in general* were in a free fall – indeed, the Great Recession led to a simultaneous collapse in trade for virtually all countries across almost all goods. Cattle and beef were no exception. Furthermore, the value of the Canadian dollar increased substantially relative to the US dollar, making it less attractive for Canadian livestock producers to export to the US market. In the end, the coincidence of the imposition of the COOL regulation and the Great Recession makes it difficult to separate a potential decrease in 2008–2009 trade volumes due to COOL from unrelated events associated with the macroeconomic shock of the Great Recession. Indeed, Figure 2 shows that while US imports of cattle from Canada were falling in 2009–2011 from their 2008 peak, US imports of cattle from Mexico were increasing.

Figure 3, illustrating the US import market for swine, shows a somewhat different story. The first distinction worth noting is that virtually all US imports of swine during the period were from Canada;[7] there were no imports from Mexico. Second, integration of the North American market in the 1990s led to a general increase in

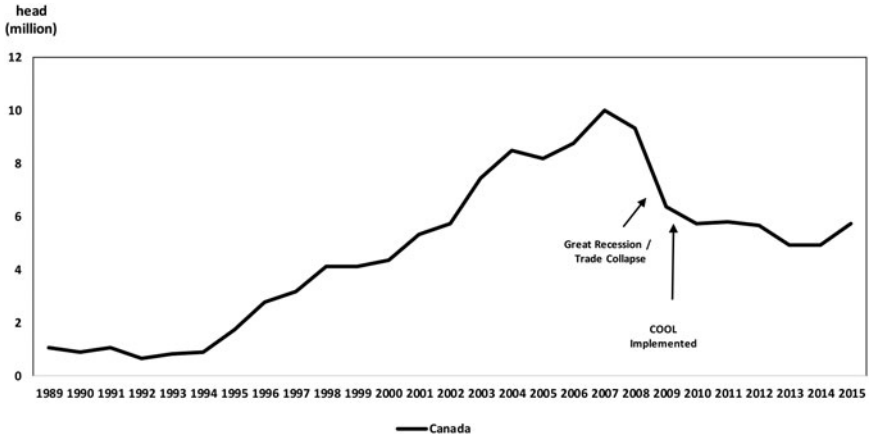
7 The US imported a tiny amount of swine from countries in Europe during this period.

Figure 2. US import volumes of cattle by source, 1989–2015



Source: Constructed by the authors with data from the USITC Dataweb.

Figure 3. US import volumes of swine by source, 1989–2015



Source: Constructed by the authors with data from the USITC Dataweb. The United States did not import swine from Mexico during this period and had sporadic imports of swine – at very small volumes – from other countries, mostly in Europe, during this period.

US import volumes from Canada until the trade collapse associated with the Great Recession in 2008.[8] US imports declined from a peak of 10 million head in 2007 to 6.3 million in 2009; again, the Great Recession's timing coincided with the

8 In 2004, the US initiated antidumping and countervailing duty investigations against imports of swine from Canada. Preliminary duties of 14.06% were applied in October 2004 but refunded after the April 2005 negative final injury determination by the USITC (Bown, 2015). US import growth of swine from Canada rose steadily until 2007.

implementation of COOL. Since then, volumes have stabilized at slightly more than half their peak levels.

3. Determination of the Article 22.6 Arbitrators' Formula: more than trade effects?

The dispute between, Canada, Mexico, and the United States tasked WTO arbitrators with determining the upper limit to the amount that Canada and Mexico would be authorized to retaliate against the United States if the latter failed to bring its regulation into compliance with WTO legal rulings. The first issue that arbitrators need to confront in every instance in which retaliation is authorized is: What formula will be used? Canada and Mexico argued that the retaliation level in this case should go beyond the 'trade effects' approach that prior arbitrations had relied on to also include domestic price effects. This section evaluates potential frameworks, the complainants' arguments, and the arbitrators' selected formula.

3.1 A model-based formulation of reciprocity to limit retaliation

To evaluate the arbitration approaches proposed by Canada and Mexico, as well as that adopted by the arbitrators, we introduce a very simple model (Bown and Ruta, 2010) that illustrates the retaliation limit implied by the Bagwell and Staiger (2001) mathematical formulation of reciprocity.[9] The Bown–Ruta model was previously used to evaluate how close earlier Article 22.6 arbitrators were in relying on the Bagwell–Staiger formulation in the first ten disputes that reached that phase of the DSU process.[10]

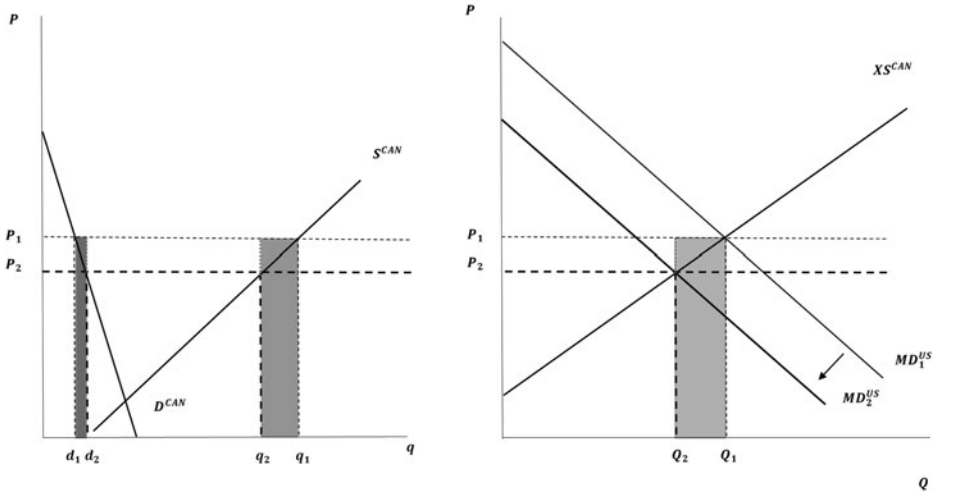
For ease of exposition, we limit the discussion to two countries: the United States (respondent) and Canada (complainant).[11] Figure 4 illustrates the Canadian domestic market for livestock (left panel) and the international market for livestock trade between Canada and the United States (right panel), including Canada's export supply of livestock, given its domestic market conditions (shown in the left panel), and US import demand for livestock given its domestic market conditions (not shown). A WTO-consistent regime for the United States would yield an import demand curve of MD_1^{US}, the market-clearing price would be P_1, and the equilibrium volume of trade – Canadian exports of livestock to the United

9 Bagwell and Staiger (2001) present the partial equilibrium model first developed in general equilibrium in Bagwell and Staiger (1999). For a book-length treatment that incorporates many additional extensions to these models, see Bagwell and Staiger (2002).

10 See also Grossman and Sykes (2011), Howse and Staiger (2006), Bagwell (2008), and Bown (2002). In particular, our qualitative analysis here abstracts from the issues raised by Grossman and Sykes that the results can change once we take into consideration cases where there are differences in the import demand and export supply elasticities.

11 On the issue of what formula to select, Mexico's arguments essentially duplicate the Canadian arguments described here.

Figure 4. The retaliation limit under the mathematical formulation of reciprocity: Canadian domestic livestock market (left) and Canada–US livestock trade (right)



States – would be given by Q_1. In the Canadian domestic market (left panel), Q_1 is equivalent to the difference between domestic quantity supplied (q_1) and domestic quantity demanded (d_1) at price P_1.

Now suppose the United States implements a non-tariff barrier, such as the COOL regulation. This shifts the US import demand curve for livestock from MD_1^{US} to MD_2^{US}, causing the volume of US imports from Canada to fall from Q_1 to Q_2 (right panel) and total livestock production in Canada to fall from q_1 to q_2 (left panel).

Under the Bagwell and Staiger (2001) mathematical definition of reciprocity serving as a limit to the tariff retaliation, the Bown–Ruta model shows that this would be given by the shaded area in the right panel, or equivalently by the combination of the two shaded areas of the left panel. These rectangular areas are determined by the initial world price (P_1) multiplied by the difference between the WTO-consistent level of exports (Q_1) and the level of exports under the WTO-*in*consistent COOL measure (Q_2) i.e., $P_1[Q_1 - Q_2]$ in the right panel, which is equivalent to $P_1[q_1 - q_2] + P_1[d_2 - d_1]$ in the left panel.

It would be easy for arbitrators to implement this theoretical formula. Provided that post-violation import volumes (i.e., quantities Q_2) can be disentangled from post-violation import values (i.e., P_2Q_2), this reciprocity formula is no more difficult to implement than the trade effects formula that the arbitrators have frequently chosen, including in *US–COOL*, as we describe next.[12]

12 In practice, there are some instances in which trade volume data are not reported or available; all that is available is the value of the transactions. In such instances, this formula could not be implemented.

In both this case and in the arbitrators' choices, Q_1 and P_1 are unobserved or 'counterfactual' (WTO-consistent) levels of trade volumes and prices. The arbitrators need to derive these counterfactual levels for Q_1 and P_1 through economic modeling techniques, as we describe in Section 4. For now, it is sufficient to note that the arbitrators could come up with estimates for Q_1 and P_1, and this implies that they could have implemented the theoretically motivated Bagwell–Staiger formula of Figure 4 if they had wanted to do so.

3.2 *The Arbitrators' decision on the formula in US–COOL*

The arbitrators in *US–COOL* could have implemented a level of retaliation consistent with this definition of reciprocity, but they did not. Instead, they followed earlier panels, such as *EC–Bananas III* and *EC–Hormones*, and used a trade effects formula under a slightly different definition of a change in export revenues. The alternative formula is illustrated in Figure 5.

In *US–COOL*, the arbitrators authorized the complainants to retaliate by an amount equal to $[P_1Q_1 - P_2Q_2]$ (right panel of Figure 5). This is equivalent to $[P_1(q_1 - d_1) - P_2(q_2 - d_2)]$, illustrated in the left panel. The change in export revenue under this trade effects approach allows not only for volumes to change $(Q_1 \rightarrow Q_2)$, as is also the case under the reciprocity formula, but also for prices to change $(P_1 \rightarrow P_2)$. The latter is different from the reciprocity formula, which evaluates the change in export volumes at the fixed price of P_1.

The level of retaliation under the trade effects approach illustrated in Figure 5 will be at least as large as the amount of retaliation authorized under the reciprocity approach illustrated in Figure 4.

It is, however, instructive to consider two scenarios in which the trade effects and reciprocity approaches are equivalent. The first occurs when $Q_2 = 0$, i.e., the WTO-inconsistent US non-tariff barrier is *prohibitive* and cuts off all imports from the complainant of the disputed product. The second occurs when $P_2 \rightarrow P_1$, i.e., the WTO-inconsistent US non-tariff barrier results in very little change in the exporter received price, which could happen if the export supply curve is very elastic. Otherwise, the trade effects approach permits a larger amount of retaliation by the complainant than the strict definition of reciprocity implied by the Bagwell–Staiger formulation.

3.3 *Evaluating the complainant's request for a different formula*

Next consider what Canada, the complainant, requested in the arbitration for additional compensation – *beyond* the trade effects illustrated in Figure 5 – for the negative impacts on domestic sales (in the Canadian market) due to the WTO-inconsistent COOL measure. In Figure 6, we use this simple economic model to describe potential ways of interpreting this request to evaluate the arbitrators' decision not to include it in the formula for determining Canada's retaliation limit.

Figure 5. The retaliation limit under 'trade effects'

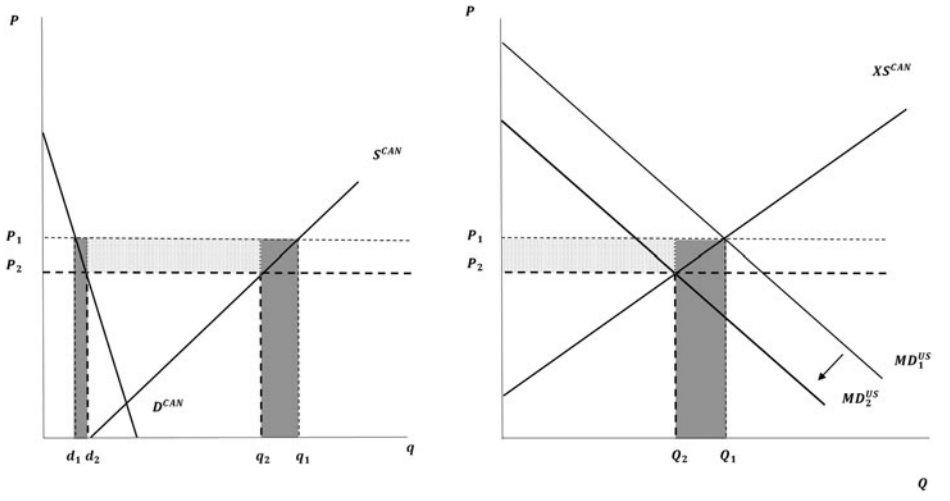
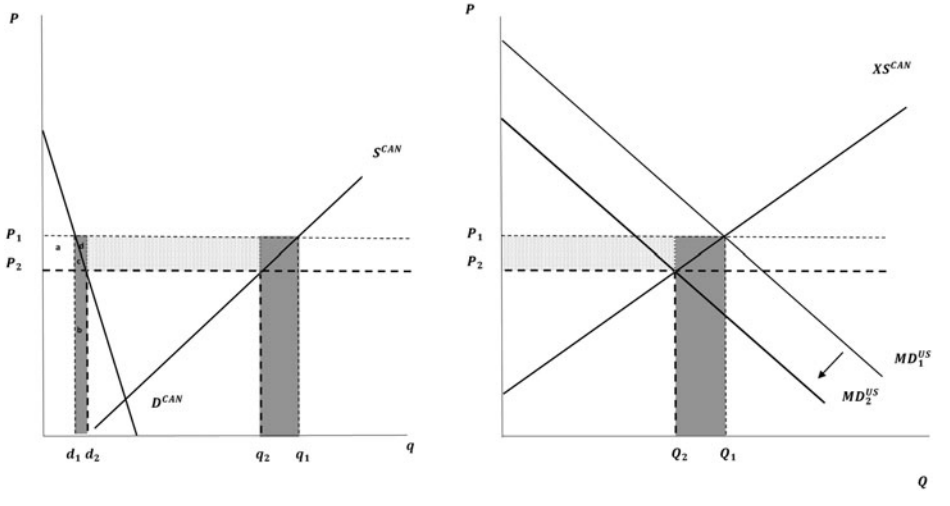


Figure 6. The retaliation limit under 'trade effects' plus 'domestic price suppression'



One possible way to interpret the request is that Canada seeks to be compensated for lost domestic revenue for its livestock producers for their livestock sold at home. Recall that in the model, the Canadian price of livestock falls from P_1 to P_2 when the United States implements COOL. However, as Figure 6 illustrates, because of

the standard assumption that the Canadian demand curve for livestock is downward sloping, quantity demanded (i.e., the volume of domestic sales) increases from d_1 to d_2 with the decline in price. Thus, it is not necessarily the case that Canada's domestic revenues fall with the implementation of COOL. The change in revenue associated only with the change in domestic (Canadian) sales is given by $[P_2d_2 - P_1d_1]$, or the area $[b - a]$ in Figure 6. If $b > a$, the change in domestic revenues associated with the decrease in price is positive because of the COOL requirement. Specifically, revenues associated with domestic sales increase with a decline in the domestic price when the initial equilibrium is situated at a relatively elastic part of the demand curve, so that the percentage increase in quantity is larger than the percentage decrease in price.

An alternative way of interpreting the request is that perhaps Canada seeks to recoup the lost revenues, associated with the drop in price, which would be limited to the domestic sales volume that would have existed under a WTO-consistent policy. This approach ignores the (positive) change in revenues associated with the increase in Canadian quantity demanded due to the fall in price (area b in Figure 6) and only considers the losses due to the original level of sales (area a in Figure 6).

The problem with such an approach is that it ignores the fact that when the Canadian price of livestock falls from P_1 to P_2, Canadian purchasers of livestock (meatpackers and final consumers) benefit. In Figure 6, their economic well-being is measured by the economic concept of 'consumer surplus': with the decline in price, Canada's consumer surplus in the livestock market increases by the area given by $[a + c]$. These gains to Canadian consumers of the lower price more than offset the losses in producer surplus associated with the change in domestic sales $[a]$.[13]

Furthermore, the complainant's proposed approach is ad hoc and moves further from reliance on an economic modeling framework. Such a framework is beneficial in that it imposes discipline on the arbitrators through both consistency of analysis and the requirement that all changes be taken into account.[14]

13 Of course, they do not offset the total loss in producer surplus that would also include the loss in producer surplus associated with lost export volumes, but we have already addressed those through the analysis of trade effects.

14 One way to allow the complainant to include domestic price suppression losses into their calculation would be if, when computing the products over which to retaliate, the modeling approach took into account not only the lost exports that would arise due the retaliatory tariff, but also the domestic price suppression losses in the respondent's market that it would suffer as a result of the retaliation. Our conjecture is that if markets were symmetric, the theoretical result would be that the domestic price suppression effects would cancel out and we would end up with what is given in Figure 5 under the trade effects approach. Thus, it is unnecessary to expand the scope of the analysis to consider the effects of domestic price suppression because the retaliation would lead to equivalent domestic price suppression for the goods being retaliated against in the respondent's market.

The complainant's proposal seeks to focus only on the ways in which COOL imposed losses on Canadian economic well-being, ignoring benefits elsewhere in the Canadian economy. Such a non-model-based approach leads to double counting. It also raises follow-up questions regarding where to draw the line.

First, if one were to adopt the complainant's approach, the next logical question would be: Why stop at only trade losses (the shaded areas of Figure 6) and losses in domestic sales (area *a* in Figure 6)? For example, in a different modeling framework, one could show that there were also losses to domestic factors of production that are specific to the livestock industry. From that perspective, why not also add into the calculation the workers whose wages are lower or the investors in livestock production (capital owners) whose rents are lower, each of which also loses in the short run because of falling prices of Canadian livestock? Our reason for leaving them out of the analysis here is that they are not included in this particular economic model, and the choice of economic model determines what data are needed, and what are not, to compute the retaliation. Put differently, reliance on an economic model clarifies not only where to begin the analysis but also where to draw the line and end the analysis.

Second, the complainant's non-model-based approach ignores that any change in trade policy has distributional impacts for a country that must be considered in an economic welfare calculation. Specifically, there are segments of the Canadian economy in which the change in economic well-being due to the COOL requirement is positive, as observed in Figure 6. As mentioned, Canadian meatpackers and consumers of beef gain from COOL because more domestic production is retained locally and prices are lower. However, just as an economic model provides a framework to show where to draw the line in counting up losses, it imposes discipline that appropriately limits the scope of those who benefit from the COOL measure as well. In a different economic model, other domestic groups could be shown to benefit from the lower Canadian consumer prices for beef from the COOL measure. For example, Canadian producers of ketchup and mustard – complements to the consumption of beef – are better off as the price and consumption of such goods increase with the increased consumption of beef.

These points push back against the complainant's proposal in the *US–COOL* arbitration, in which the complainant cherry-picked a longer list of groups in Canada that suffered negative distributional effects from the measure, without considering what would likely be an equally long list of those who enjoyed positive distributional effects.

However, these observations also reinforce the argument against the approach that the arbitrators have undertaken in *US–COOL* and in other disputes (e.g., *EC–Hormones*). While the Bagwell and Staiger (2001) modeling framework provides logic-based and model-based consistency for defining a level of retaliation limited to the WTO-consistent policy's world price multiplied by the change in export volumes (e.g., $P_1[Q_1 - Q_2]$; Figure 4), it does not follow for the change in

the export revenue rule that the arbitrators have seemingly followed (e.g., $[P_1Q_1 - P_2Q_2]$; Figure 5) since the early WTO decisions (Bown and Ruta, 2010).

Thus, while the arbitrators made the right decision to reject the complainant's proposal to include domestic price suppression effects, it is still somewhat unclear why they have continued to apply the trade effects formula that they apply.

4. Implementing the formula

Once arbitrators decide on a formula, the next step is for them to establish the counterfactual values needed to implement it. This section describes what the complaining countries requested in this case, what the arbitrators granted, and some of the challenges that arise when arbitrators attempt to implement the formula.

4.1 The scale of the trade effects in US–COOL

Before going into details of the determination of which elements would feed into the formula, we step back to consider the scale of retaliation that Canada and Mexico requested, as well as what was authorized, to put these into perspective.

In the 2015 arbitration, Canada requested roughly $2.4 billion (CAN $3.1 billion) and Mexico $713 million in retaliatory compensation. Even when focusing on the requests limited to perceived export revenue losses (under the trade effects formula), Canada requested $1.6 billion (CAN $2.0 billion) and Mexico $515 million. The United States claimed much smaller trade effects due to the COOL measure, estimating the lost export revenue for Canada at $43 million and for Mexico $48 million – i.e., less than $100 million combined.

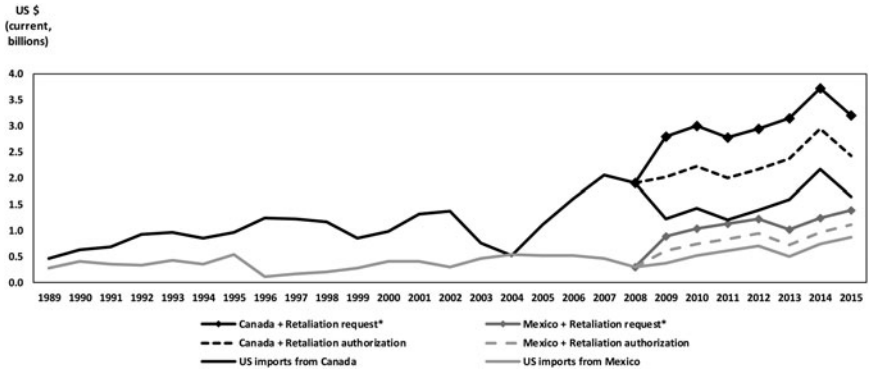
The Article 22.6 arbitrators ultimately granted Canada $805 million (CAN $1.054 billion) and Mexico $227.8 million. Again, retaliation granted is based on a formula that gives the value of export revenue *lost* annually because of the COOL regulation. These figures thus represent approximations of the value of *additional* annual bilateral exports to the US market in 2009–2015, had the COOL regulation not been in place.

Figure 7 puts these amounts into perspective by plotting them with the information on actual US imports of cattle and swine from Canada and Mexico over the 1989–2015 period. The solid lines represent US imports from Mexico (grey) and Canada (black), the dashed lines represent what the arbitrators granted plus the actual level of imports, and the lines with boxes represent the 'trade effects' portion of the Canadian and Mexican requests plus the actual level of imports.[15]

Consider Canada beginning in 2009, the year of COOL implementation. The arbitrators' authorized level of retaliation puts their approximation of what Canada's exports to the United States would have been without the COOL

15 That is, for the Canada and Mexico retaliation requests, we do not plot the additional amount that each requested due to the 'domestic price suppression' effects that the arbitrators denied.

Figure 7. US imports of livestock and implications of proposed WTO retaliation levels, 1989–2015



Source: Constructed by the authors with data from the USITC's Dataweb and WTO reports.
*indicates the retaliation requests limited to only the 'trade effects' component and thus does not include the additional request for the 'domestic price suppression' component (that the arbitrators denied formulaically).

regulation at $2 billion, roughly equivalent to its peak level of exports in 2007. This is relevant because the arbitrators are essentially indicating that Canada's cattle exports would not have declined at all in 2007–2009, even though there had been a global trade collapse in 2008–2009 – in virtually all products and in all countries – due to the Great Recession.

The story for Mexico is even more dramatic. The arbitrators' decision implies that Mexico's exports of cattle to the United States would have increased by roughly 30% in 2007–2008 but for the COOL regulation.

Before imposition of the COOL regulation, total US livestock imports from Canada and Mexico peaked at $2.5 billion in 2007. Given that exports in 2014 – with the COOL regulation still in place – were $2.9 billion, this implies that total combined exports without COOL in 2014 would have been $3.9 billion, or that – but for COOL – Canada's and Mexico's exports would have increased by 87% over seven years. These numbers are clearly difficult to rationalize against the US market reality and thus raise important questions about how the arbitrators arrived at such figures.

It is worth pointing out that at least the arbitrators did not grant the even higher levels that Canada and Mexico had requested, which are also plotted in Figure 7.

4.2 *Difficulties for Arbitrators in attempting to implement the COOL formula*

As indicated in Section 3, once arbitrators decide on a formula, they need information on the values of the parameters that will be used to compute the formula. In particular, post violation import volumes (i.e., quantities, Q_2) are known – see,

for example, the data for the US cattle market (Figure 2) or US swine market (Figure 3). Thus, the arbitrators only need to determine counterfactual levels of Q_1 and P_1, or the projected trade volumes and prices if the United States had implemented a WTO-consistent COOL regulation.

The intellectual exercise is thus to predict Canada's exports of cattle and hogs and Mexico's exports of cattle to the US market in 2009 and beyond, in order to compare those predicted values with the actual volumes of exports – in other words, to determine what the 2009–2015 export volumes would have looked like if the United States had not imposed the COOL measure. In such an exercise, economists typically use data from the past to predict the future.

In Figures 8 and 9, we illustrate just how divergent the outcomes to this basic prediction can be when we change only one element: the past years used to predict the future. We rely only on publicly available data, which will not match exactly what was described by Canada, Mexico, the United States, or the arbitrators in the report – data to which we do not have access. Furthermore, although we refer to decisions made by the arbitrators in implementing these economic models, we recognize that the arbitrators are frequently constrained by the quality of the data, analysis, and models that the parties put before them. This is an important factor, but we focus here on other challenges that arbitrators face.

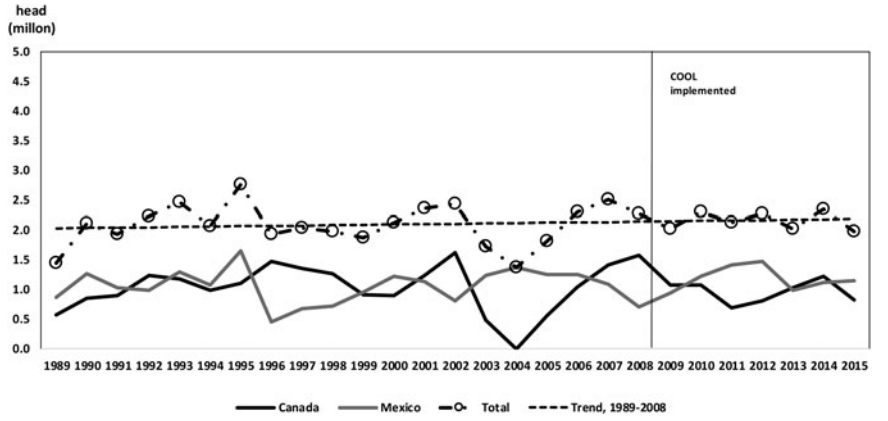
Figure 8 illustrates the supposition that post-2009 total import volumes of cattle followed the trend of total US imports of cattle over the prior 20 years (1989–2008). As we noted above, notwithstanding substantial annual fluctuations in bilateral trade during this period – e.g., when US imports from Canada declined in a year in response to a shock at home, imports from Mexico would tend to increase to fill the gap – total US cattle import volumes from the two were fairly flat. Thus, using the past data from the whole period to predict the counterfactual would suggest that US imports in 2015 were not much different from what they would have been as predicted by this 20-year pre-COOL trend – about 2.2 million head.

Suppose instead that we modify the approach that generates the counterfactual prediction very slightly along two dimensions. First, rather than data from the 20-year period we use data only from a more recent period – say, 2004–2008. Second, we construct the prediction for each US trading partner individually.

The result is illustrated in Figure 9, which shows the other extreme. This model predicts a level of Canadian exports of 4.5 million head of cattle by 2015 – twice as much as Canada had exported to the United States in any given year before COOL, and twice as much as the total predicted to be exported by Canada and Mexico combined in Figure 8 under the alternative approach.

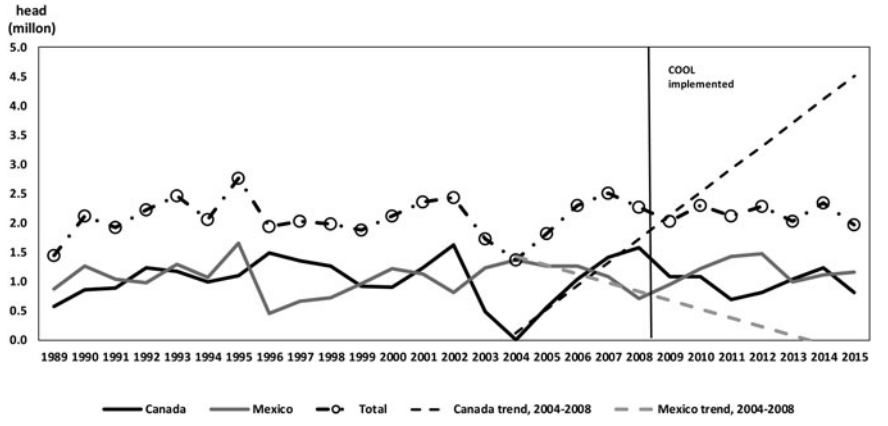
Why is this prediction for Canada so different? Canada had a BSE crisis that left its cattle exports at zero in 2004. Once the US BSE import ban was lifted, because Canada already had a highly developed production capacity, it experienced a substantial increase in export growth to the United States in 2005–2008. However, this growth was not driven by some underlying economic fundamental, like a boost in productivity that might occur after adoption of a new technology. The sharp

Figure 8. Using 1989–2008 total trends to construct counterfactual cattle export volumes



Source: Constructed by the authors with data from the USITC's Dataweb.

Figure 9. Using 2004–08 bilateral trends to construct counterfactual cattle export volumes



Source: Constructed by the authors with data from the USITC's Dataweb.

increase in export growth over 2005–2008 was simply due to Canada's resuming cattle exports from zero in 2004 to the 2002 (pre-BSE) levels. Put differently, it is unlikely that Canada would have kept up the same level of export *growth* that it experienced in 2005–2008 after 2008 – i.e., once it had reattained its pre-BSE levels of exports to the United States and was again producing and exporting at capacity.

The years chosen to illustrate this argument were selected deliberately, of course. The point is that even the selection of years to use in the historical sample to generate a prediction can make a sizable difference in the results.

To see this even more clearly, suppose that the years 2004–2008 were also chosen to predict Mexican export volumes to the United States. As Figure 9 illustrates, Mexico's cattle exports to the United States were declining slightly during those years. Some of this decline was a normal market response – US imports from Mexico were declining slightly as US imports from Canada were resuming after the US lifted the BSE import ban on Canada.

The challenge of determining counterfactuals raises at least two additional complications for arbitrations such as *US–COOL* – that involve *multiple* complainant countries – to have to address.

First, to what extent should it be necessary for arbitrators to demand consistency in approach across the complainant countries? For example, the demand for consistency in generating the predictions that we have just described would require using the same years for Mexico as for Canada. That would seem like a reasonable rule of thumb, if not a requirement. But, in this instance, when that approach is taken, the trend predicts that Mexico's exports to the United States (even without COOL restrictions) would have declined to zero by 2014 (Figure 9). Would this then invalidate the use of the approach for the Canadian data?

Second, and regardless of whether such consistency of approach is required, should there be an 'adding up' constraint to impose discipline on the arbitrators? For example, in a dispute such as this, should the arbitrators be required to ensure that each country's individual model does not aggregate up to result in a combined counterfactual volume of total US cattle imports that is unrealistic, given the underlying market conditions?

Suppose that the arbitrators had adopted the approach illustrated in Figure 8 to determine Mexico's counterfactual exports and the approach illustrated in Figure 9 to determine Canada's counterfactual exports. An adding-up constraint would reveal that the *combination* of the two models' predictions provides an implausibly large increase in total exports of cattle to the US market to nearly 6 million head.

While the cases illustrated in Figures 8 and 9 are extremes, these simple exercises starkly illustrate important issues that arbitrators face in these types of disputes. Using only a very simplistic economic (time trend) model to predict the counterfactual volumes, we showed that even slight (and arguably quite reasonable) differences in the methods of applying that model can yield wildly divergent results.

Furthermore, in the application that the arbitrators adopted in the *US–COOL* dispute, there were many complicating factors besides the COOL regulation – including the Great Recession – that impacted Canadian and Mexican exports of cattle (and swine, not shown) to the United States. We documented several of them in Section 2. Constructing a level of counterfactual exports depends heavily on which of these factors the arbitrators took into consideration. As outsiders, we are unable to discern exactly which of the arbitrators' choices led to the

authorized retaliation levels that we argue were implausibly large.[16] Identifying the precise factors would require access to the underlying data and models.

4.3 Additional concerns associated with implementation of the formula

Other important issues arose during the arbitration. We do not have sufficient space to assess them all here, but flag two that raise additional concerns about the process.

The first involved the discrepancy between Canada's provision of counterfactual estimates based on weekly data and US counterfactual estimates based on monthly data. The data led to quite different results.[17] Canada argued that the weekly data were preferred because the higher frequency provided more variation that allowed for more precise estimation. The United States argued that there was likely to be more measurement error in the weekly data, which were collected by a different government agency (USDA's Animal and Plant Health Inspection Service, APHIS) than the one tasked with collecting data on official US trade statistics (Census Bureau). Unlike the monthly official trade statistics, the weekly APHIS series was not checked for errors, corrected, or revised.

Each side has a legitimate argument on theoretical (statistical) grounds. The question is: Which effect is larger and more likely to significantly bias the results? Unfortunately, that may only be discerned empirically through careful examination of the data, if at all.

Furthermore, there is the potential long-run impact associated with the US government not being allowed to prevent certain data from being used in the arbitration. Would this encourage the United States to become less transparent or have other unintended consequences? Indeed, this case involved a different US government agency (APHIS) collecting unofficial data on cattle border crossings for its own purposes of tracking animal health. But such data inadvertently ended up harming the United States. Could this result in one US government agency (e.g., the Census Bureau) being forced to instruct another US government agency (e.g., USDA) to not collect its own data on trade flows if it does not have the resources to revise the data and reconcile them with other official US data series? Given that APHIS was collecting the data with good intentions, a byproduct of such a policy could be that such a prohibition inadvertently harms public (and animal) health.

The second important concern arose because Canada and the United States used very different empirical approaches to establish their estimates.[18] Canada relied on econometric regression techniques, whereas the United States chose to use a partial

16 It is worth noting that Canada chose September 2005 as its starting point for empirical estimates (WTO, 2015: 59), consistent with our observation that the post-BSE export rebound could significantly influence the size of the results.

17 See, in particular, the discussion on WTO (2015: 54–60).

18 See, in particular, the discussion on WTO (2015: 62–67).

equilibrium simulation model referred to as an equilibrium displacement model (EDM). The arbitrators did not rule out the US approach a priori, but they did not consider it seriously, under the argument that they considered the US implementation of the model flawed because the United States assumed that the compliance costs of the COOL measure were non-discriminatory and applied to US industry.

An open question is whether the arbitrators would have been satisfied with a US model in which the United States assumed that a US meatpacker using (some) imported Canadian livestock as an input faced a higher cost of compliance than a US meatpacker using only domestic US livestock.[19] While the United States attempted such an approach in response to questions from the arbitrators, it did so only for the original COOL measure, not the amended COOL measure. The arbitrators found that to be enough to dismiss it.

In our view, it is unfortunate that more attention was not paid to exploring the results of such an alternative estimation approach. This is mainly because the parties and arbitrators constructed such widely divergent estimates for the size of the trade effects. A better understanding of the US model might have provided more insight as to the source of the large differences, and this information might have allowed the arbitrators to use an approach that provided trade effect estimates more in line with the market reality. Again, as described in Section 3, the figures they settled on seem far too large.

5. Conclusions

This arbitration involved Canada and Mexico requesting and being granted the right to retaliate against the United States for the lost export revenue associated with the US country of origin labeling regulation put into effect in late 2008, at the same time as the global trade collapse and Great Recession. The arbitrators assessed the combined losses in Canadian and Mexican export revenue at over $1 billion. This is not only the second largest retaliation authorized by an arbitration, we argue that it is unreasonably large, given that the peak value of their combined exports to the US market before the COOL regulation was roughly $2.5 billion in 2007.

Putting aside our specific critiques, the *US–COOL* arbitrators should be praised for their transparency and the level of detail provided in their report. Especially relative to earlier Article 22.6 reports, this one made it much easier for outside analysts to identify potential sources of concern with the process and applied techniques. We hope the sort of analysis and feedback presented here can help the process improve over the long term. Improvements based on specific critiques are

19 The key here is 'some' Canadian livestock. If the US firm used only Canadian livestock as an input for its beef production, it would also not have to segregate.

possible only when the arbitrators are transparent and provide useful and rich detail.

We conclude by considering the broader question of whether too much is being asked of the arbitrators in these cases. To help frame the discussion, we compare what is asked of the typical arbitrator with what is asked of an editor at a scholarly economics journal.

The editor receives two complicated empirical economics papers. The author of each paper has been asked the same question, and each seeks to convince the editor that his answer is the correct one. The editor is not an expert in the area, and so relies on referees (i.e., WTO Secretariat staff) for guidance. But that is where the similarities end, as the arbitrator faces several additional constraints. First, there is no academic literature providing even an attempt to answer a question close to what the two papers address. Second, unlike academic research, both papers reveal very little about their underlying assumptions, and they certainly provide no information as to the robustness of their estimates, where they break down, or where they are otherwise imprecise. Third, unlike a journal editor, the arbitrator has very little leeway in the requests that she can make of each 'author' to provide additional information (e.g., new specifications, robustness checks). Fourth, she has only a very limited period in which to make her decision. Finally, unlike the journal editor, the arbitrator can only choose to 'publish' and accept the results of one of the papers. In WTO dispute settlement, they cannot both be right.

References

Bagwell, K. (2008), 'Remedies in the WTO: An Economic Perspective', in M. E. Janow, V. J. Donaldson and A. Yanovich (eds.), *The WTO: Governance, Dispute Settlement, and Developing Countries*, Huntington, NY: Juris Publishing, pp. 733–770.

Bagwell, K. and R. W. Staiger (1999), 'An Economic Theory of GATT', *American Economic Review*, **89** (1): 215–248.

—— (2001), 'Reciprocity, Non-discrimination and Preferential Agreements in the Multilateral Trading System', *European Journal of Political Economy*, **17**(2): 281–325.

—— (2002), *The Economics of the World Trading System*, Cambridge, MA: MIT Press.

Bernstein, J. and D. Skully (2003), 'Calculating Trade Damages in the Context of the World Trade Organization's Dispute Settlement Process', *Review of Agricultural Economics*, **2**(2): 385–398.

Bown, C. P. (2002), 'The Economics of Trade Disputes, the GATT's Article XXIII and the WTO's Dispute Settlement Understanding', *Economics and Politics*, **14**(3): 283–323.

—— (2015), *Temporary Trade Barriers Database*, June, World Bank, http://econ.worldbank.org/ttbd/.

Bown, C. P. and J. A. Hillman (2016), 'Bird Flu, the OIE, and National Regulation: The WTO's India–Agricultural Products Dispute', *World Trade Review*, **15**(2): 235–257.

Bown, C. P. and K. M. Reynolds (2015), 'Trade Flows and Trade Disputes', *Review of International Organizations*, **10**(2): 145–177.

Bown, C. P. and M. Ruta (2010), 'The Economics of Permissible WTO Retaliation', in C. P. Bown and J. Pauwelyn (eds.), *The Law, Economics and Politics of Retaliation in WTO Dispute Settlement*, Cambridge: Cambridge University Press, pp. 149–193.

Bown, C. P. and J. P. Trachtman (2009), 'Brazil – Measures Affecting Imports of Retreaded Tyres: A Balancing Act', *World Trade Review*, **8**(1): 85–135.

Broude, T. and P. I. Levy (2014), 'Do You Mind If I Don't Smoke? Products, Purpose and Indeterminacy in US – Measures Affecting the Production and Sale of Clove Cigarettes', *World Trade Review*, **13**(2): 357–392.

Conconi, P. and T. Voon (2016), '*EC–Seal Products*: The Tension between Public Morals and International Trade Agreements', *World Trade Review*, **15**(2): 211–234.

Crowley, M. A. and R. Howse (2014), '*Tuna–Dolphin II*: A Legal and Economic Analysis of the Appellate Body Report', *World Trade Review*, **13**(2): 321–355.

Greene, J. L. (2015), 'Country-of-Origin Labeling for Foods and the WTO Trade Dispute on Meat Labeling', *Congressional Research Service Report* 7-5700, 8 December.

Grossman, G. M. and A. O. Sykes (2011), 'Optimal Retaliation in the WTO: A Commentary on the Upland Cotton Arbitration', *World Trade Review*, **10**(1): 133–164.

Hoekman, B. and J. P. Trachtman (2010), 'Continued Suspense: *EC–Hormones* and WTO Disciplines on Discrimination and Domestic Regulation Appellate Body Reports: Canada/United States – Continued Suspension of Obligations in the *EC–Hormones* Dispute, WT/DS320/AB/R, WT/DS321/AB/R, adopted 14 November 2008', *World Trade Review*, **9**(1): 151–180.

Horn, H. and J. H. H. Weiler (2003), 'European Communities: Measures Affecting Asbestos and Asbestos-Containing Products', in H. Horn and P. C. Mavroidis (eds.), *The WTO Case Law of 2001*, Cambridge: Cambridge University Press, pp. 14–41.

Howse, R. L. and H. Horn (2009), 'European Communities: Measures Affecting the Approval and Marketing of Biotech Products', *World Trade Review*, **8**(1): 49–83.

Howse, R. and P. I. Levy (2013), 'The TBT Panels: *US–Cloves, US–Tuna, US–COOL*', *World Trade Review*, **12**(2): 327–375.

Howse, R. and D. J. Neven (2005), '*United States – Tax Treatment for 'Foreign Sales Corporations*, Recourse to Arbitration by the United States under Article 22.6 of the DSU and Article 4.11 of the SCM Agreement (WT/DS106/ARB): A Comment', in H. Horn and P. C. Mavroidis (eds.), *The WTO Case Law of 2002: The American Law Institute Reporters' Studies*, Cambridge: Cambridge University Press, pp. 36–63.

Howse, R. and R. W. Staiger (2006), '*United States – Anti-Dumping Act of* 1916 (*Original Complaint by the European Communities*), Recourse to Arbitration by the United States under 22.6 of the DSU, WT/DS136/ARB, 24 February 2004: A Legal and Economic Analysis', *World Trade Review*, **5**(1): 254–279.

Levy, P. I. and D. H. Regan (2015), '*EC–Seal Products*: Seals and Sensibilities (TBT Aspects of the Panel and Appellate Body Reports)', *World Trade Review*, **14**(2): 337–339.

Mavroidis, P. C. and K. Saggi (2014), 'What Is Not So Cool about *US–COOL* Regulations? A Critical Analysis of the Appellate Body's Ruling on *US–COOL*', *World Trade Review*, **13**(2): 299–320.

Neven, D. J. and J. H. H. Weiler (2006), 'Japan: Measures Affecting the Importation of Apples (AB-2003–4): One Bad Apple?', in H. Horn and P. C. Mavroidis (eds.), *The WTO Case Law of 2003: The American Law Institute Reporters' Studies*, Cambridge: Cambridge University Press, pp. 280–310.

WTO (2015), *United States – Certain Country of Origin Labelling (COOL) Requirements, Recourse to Article 22.6 of the DSU by the United States, Decisions by the Arbitrator*, WT/DS384/ARB and WT/DS386/ARB, 7 December, Geneva, Switzerland: WTO.