

The Political Economy of Strategic Trade Policy: Explaining the Brazil-Canada Export Subsidies Saga

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Abstract

In this paper we study the on-going trade dispute between Canada and Brazil on export subsidies in the regional jet industry and the reasons for its escalation. We argue that the framework proposed by Marc Busch in his book *Trade Warriors* to analyze trade disputes in high-tech industries also holds in this case, but that the increasing use of risk-sharing arrangements, which both Bombardier and Embraer undertake, raises questions about the internalization variable. If foreign firms are free-riding on nationally-funded programs, would states be willing to go to trade war over them? We think that in both Canada and Brazil ideas have an important place in explaining why this dispute drags on. For Canada, two ideas appear important; first the country's belief in a rules-based trading regime that leads it to strongly oppose violations; and second, Canada's insecurity about its competitiveness which has led to a variety of government schemes to support Canadian firms in advanced sectors like aerospace. For Brazil, its place as a leader of the developing world acts as a rallying point for government and firms alike. The research also poses the question of whether the WTO process has actually made a resolution of the dispute more difficult. Finally, while the focus of this paper is not normative, we think that at least one broad policy implication can be drawn from this case, how to better take into account the concerns of developing countries and hence smooth the way towards further trade liberalization?

1. Introduction

Since 1998, the WTO has ruled three times that the Brazilian interest rate equalization program, called Pro-ex, is illegal. Ottawa, for its part, has been found guilty by the WTO for subsidizing Bombardier's regional jets. On 9 May 2000, Canada launched an unprecedented US\$ 3.3bn trade attack on Brazil – one of the largest disputes in the history of the World Trade Organisation (WTO) – over its refusal to remove subsidies for its aerospace sector. Major Brazilian exports, such as meat, fruit, vegetables, coffee, leather goods, wood, textiles, shoes, steel, and machinery will be affected. “The ideal outcome is a negotiated settlement. But when you see that Brazil does not seem to play fair game over such an important issue, well, you have to act and the government of Canada is going to act” said Trade Minister Pierre Pettigrew.¹ The day after, Brazil warned that Canada's threat of sanctions “could make it difficult or even impossible to seek alternatives which would prevent an irrational escalation of the dispute, with the capacity to set off counter-retaliations or other measures that would damage the economic and commercial relationship in different areas”.² Brazil suggested targeting the substantial Canadian investment there or cutting off airline flights between the two countries.

That grubby dispute erupted into an out-and-out war in February 2001 when Canada banned imports of processed Brazilian beef, citing the risk of mad-cow disease.³ Many analysts, not just Brazilian ones, said Canada was using the beef ban in a heavy-handed effort to force Brazil to scrap the jet subsidies. President Cardoso warned that a failure to correct “this hasty decision” would lead to retaliatory measures, Congress suspended consideration of all unratified bilateral agreements with Canada, and the Communications Minister hauled representatives of Canadian telecom companies warning them of the unpleasant consequences they faced if their government did not suspend the ban.⁴ When cattle breeders dressed in Mountie suits paraded a cow named Bombardièrre in front of the Canadian embassy – and argued that this was the really mad one – Ottawa's diplomats retorted that in the country of soccer it should be clear that after two yellow cards one is sent off.⁵

Why do these countries choose to wage a trade war that may benefit one firm, but have serious consequences - not only for consumers and the future of the multilateral trading world – but also for some of the largest corporations in each of them? Brazil and Canada

¹ “Trade attack launched on Brazil”, *Globe and Mail*, 10 May 2000.

² “Brazil threatens trade war retaliation”, *Globe and Mail*, 11 May 2000.

³ Canadian officials said there was no evidence of BSE in Brazil, which has the largest number of cattle in the world, but they said Brazil had not provided information Canada had requested (“Canada bans imports of Brazilian beef”, *Financial Times*, 5 February 2001).

⁴ “Brazil threatens retaliation over Canada's beef ban”, *Financial Times*, 10/11 February 2001.

⁵ “Brasil breca ‘faroeste aéreo’ do Canadá”, *A Folha de S. Paulo*, 2 February 2001 and “La vache folle Bombardièrre, vedette du rodéo entre le Brésil et le Canada”, *Le Monde*, 11/12 February 2001.

are otherwise perfect partners with hardly any serious bilateral disputes.⁶ They are both members of the Cairns Group of large agricultural exporters. Brazil is Canada's seventh most important destination for foreign investment and its largest export market in South America. Canadian suppliers have carved out Brazilian markets in mobile cellular telephony, graphics packages, remote sensing, environmental technologies, cattle genetics, and wheat. The battle with Brazil could also hurt Canada's attempts to expand trade with developing countries, sign free-trade agreements with Latin America, and strengthen bilateral relationships to counterweight the US hemispheric hegemony.⁷ That it escalated only a few months ahead of the Third Summit of the Americas in Quebec City was something that caught many by surprise.

In the latter part of the 1980s, the concept of industrial policy received fresh support from developments in the economics of international trade and industrial organization. A key advance in this regard was the concept of "strategic trade policy" (STP). This literature identifies a wide range of situations, not dealt with in standard models, in which government intervention can theoretically improve national economic welfare by helping the reallocation that trade engenders, including the creation of high value-added jobs. These situations typically involve imperfect competition, dynamic economies of scale, and/or first mover advantages. These conditions are widely postulated to be characteristic of many high tech and other "new" industries.

When it is not theoretical, most economics literature on STP is concerned with its welfare effects. On the surface, the theory provides a rationale for extensive government intervention in the form of subsidies, tariffs, or other measures as a means of promoting economic growth. However, it has been recognized that theoretically plausible rationales for limited intervention can all too easily lend themselves to rent seeking and protectionism. Much less attention is devoted to the dynamics of state support for high-technology firms and sectors, the conditions that in practice lead policy-makers to protect an industry, or more precisely in most cases a single firm, and risk retaliation from the aggravated partner.

In one of the few such studies taking a political economy approach to strategic trade policy, Marc Busch examines several of the most important commercial rivalries in high technology – civil aircraft, semiconductors, high-definition television, robotics, and semiconductors – to evaluate how externalities have shaped decision-making processes.⁸ He argues that the degree to which competing states enter into a potentially-escalating interventionist race is a function of the capacity to consume the (linkage and spillover) externalities that a national champion exhibits and retain them domestically.

⁶ "Getting Over the Jet-Lag", Canadian Foundation for the Americas (Focal), *Policy Paper*, no. 01-3, February 2001.

⁷ "Canadá vai manter subsídios a Bombardier", *Valor*, 23 April 2001 (interview with Canada's Minister of Industry).

⁸ Busch (1999).

We contribute to the literature on the political economy of strategic trade policy by testing Busch's hypotheses to the Brazil-Canada export subsidies imbroglio. We make some modifications. First, we explicitly consider the politics of making STP and the role of ideas; second, Busch's analysis largely predates the Marrakesh agreement and excludes the WTO from the reference framework, so we investigate how the new situation changes the incentives to intervene. In particular, we intend to analyze the following issues:

- On what grounds do producers of regional aircraft like Bombardier and Embraer demand export and/or research and development subsidies? How important are linkage and spillover externalities and to what extent are they internalized within national borders?
- What is the electoral clout of the regional aircraft industry in Brazil and Canada? Which other political variables and interest groups have a stake in this industry?
- To what extent does the heat of this commercial rivalry reflect the interests of the firms themselves? How strong have they proved in lobbying for protection?
- What reasoning lies behind the WTO decisions on this subject? Why has the rivalry escalated despite the WTO rulings? What difference does it make the fact that one of the interested parties is a developing country?

We proceed as follows. In Section 2 we analyze the literature on the political economy of trade policy, focusing on the concepts of consumption and internalisation whose variance, according to Busch, accounts for the variability in trade disputes and rivalry. We then argue that this reference framework must be slightly modified to reflect the introduction of a formal mechanism for trade dispute settlement following the establishment of the WTO. Section 4 describes the successive steps of the WTO dispute since 1996, while section 5 focuses on the emergence of the aerospace industry in Brazil and Canada. In the following sections we analyze a number of possible explanations for the escalation before concluding with some more general comments and policy implications.

2. The Political Economy of Strategic Trade Policy

The renewed interest in the role state authority plays in fostering domestic high-technology sectors dates from the mid-1980s, as major OECD countries including the United States entered into a phase of slower economic growth and rising unemployment levels. In particular, a host of academic and journalistic accounts of 'American decline' began to explore why that country was not ruling the roost in high-tech industries anymore and what was behind the increasing success of European and Japanese competitors, not to mention those from Asia's Newly Industrializing Countries. The first question was, is there something wrong with the American model of capitalism? The second question asked whether foreign decision-makers, in government and business alike, were developing models of development that somehow fitted better with the requirements of modern, technologically advanced economies.

This literature stream produced studies in comparative politics that, even if the comparison was not explicit, suggested that many European states – especially Germany and Scandinavian states – understood how economic success rested on an acceptance of a key role for the state in regulating economic activity.⁹ Even more influential has been the work of Michael Porter.¹⁰ He argued that national prosperity is based on a nation's competitive advantage in particular industries, which derives, in turn, from having strong domestic rivals, aggressive home-based suppliers, and demanding local customers. But as nations, states, and regions compete, they can make use of the appropriate policy instruments to create an environment in which companies can gain competitive advantage. While shying away from calling for more direct government involvement in the process, except in nations early in the development process, Porter acknowledged that, as important as static endowments may be, patterns of trade specialization change over time. Growing out of this work came an extensive body of research on the influence of location on competitiveness, with a special focus on the role of clusters.

Another research stream began asking how these different domestic arrangements manifested themselves in international trade. Relative American indifference to how the international trading system operated began to erode in the late 1970s as American firms came under severe competitive pressure.¹¹ Whereas in the immediate postwar era US firms dominated their sectors, two decades of Japanese and European reconstruction produced formidable competitors. Thus, US steel, agriculture and car firms saw their foreign markets invaded and, worse, the US domestic market no longer offered a safe haven. More worryingly, however, was the seeming slippage in American dominance in the 'industries of tomorrow': electronics, computers, advanced materials, aerospace and pharmaceuticals. This particular cluster of industries interested economists because of the peculiar economics that might be present. These sectors were thought to exhibit various characteristics of imperfectly competitive industries: high barriers to entry, especially in the form of R&D intensity; learning effects; and increasing returns to scale.

There are persuasive grounds for thinking that aerospace is likely to be subject to market failures, notably long lead times, large scale economies in production, and the importance of research and development. As most recently shown by C. Lanier Benkard, the dynamics of aircraft production are characterized by huge returns from learning, thus making infant industry protection theoretically valid.¹² Equally important, the incremental nature of technological innovation in civil aerospace, coupled with the demanding and costly certification procedures, tends to force competing manufacturers to produce remarkably similar products.¹³ The regional jet market was no different in

⁹ See for example Katzenstein (1981).

¹⁰ Porter (1990).

¹¹ Winham (1986).

¹² See Benkard (2000).

¹³ McGuire (1999).

this respect. In the absence of a clear technological advantage, producers compete on price: and government subsidies can have a decisive effect on price competitiveness.¹⁴ This circumstance, however, weakens the theoretical argument for intervention. STP implications are sensitive to the mode of oligopolistic competition played by industry participants. If this is of the Bertrand type, it is questionable whether using export subsidies raises a country's welfare.

The idea that governments can affect the credibility and success of market entry was in vogue in the mid-1980s with the development of 'strategic trade theory'. In their seminal 1985 article, James Brander and Barbara Spencer modelled the international trade implications of high-technology industrial policies.¹⁵ A particular country's government assures its exporter, whom it wishes to set up as a "Stackelberg leader,"¹⁶ of subsidies supporting its sales in third countries, where it is in competition with the other world-industry duopolist. The justification for promoting these industries rest on two theoretical assumptions: rents and externalities. Rents are a premium – an excess profit – earned by an input in one use as opposed to another. Rents are not supposed to exist in perfectly competitive markets – firms will come in and compete away any excess – but they could exist in imperfectly competitive markets. In these, incumbent firms would reap the excess profits and in doing so raise national income generally. Externalities are the benefits reaped by associated industries upstream or downstream from the targeted sector. The advantage of supporting, for example, civil aircraft production lies not merely in the rents that aircraft maker might gain, but the competitive benefits reaped by its suppliers and consumers. Seen in this light, strategic trade and industrial policies offer enticing benefits to firms and their governments. According to this view, governments give credibility to entry by committing to absorb whatever losses may occur. Provision of finance for fixed development costs signal this intention. A massive research program has explored the prospects for strategic trade policy and two broad conclusions emerge.¹⁷ First, that it is difficult to identify which industries should receive strategic promotion or its appropriate form and level. Second, that even a successful strategic trade policy is likely to generate rather modest payoffs. More generally, export subsidies, even when designed to counterbalance tariffs, do not enhance welfare even when sales abroad expand.¹⁸

The literature has established the theoretical foundations for government intervention, but another, though obviously closely related, question concerns the actual outbreak of a trade war. Following the use of illicit trade policy measures by one country, the

¹⁴ Pavcnik (2001), 7. As Golich (1992: 906) observes, aircraft purchase is very capital intensive from a user's standpoint. This reinforces the focus on price.

¹⁵ According to Feenstra and Rose (2000), Brander and Spencer (1985) is the most cited paper in the history of the *Journal of International Economics*.

¹⁶ Stackelberg leadership shifts profits from the "follower" to the leader.

¹⁷ See Krugman (1986), Feenstra (1988), Baldwin (1988), and Krugman and Smith (1994). Other than those included in these edited volumes, specific studies on the aerospace industry include Baldwin and Flam (1989), Neven and Seabright (1995), and Irwin and Pavcnik (2001).

¹⁸ See Panagariya (2000).

aggravated party or parties may choose among several options, e.g. ignore, comply, retaliate, accept mediation, or bargain.¹⁹ While strategic trade policy seemed to presage an increase in trade wars as states responded to each other's rent-capture policies with their own programmes, the evidence of strategic trade wars is at best, mixed. In two of the most famous high-technology sectors, civil aircraft and semiconductors, managed trade agreements were negotiated among the main parties.²⁰ Moreover, if we consider EU-US trade relations, wars occur in decidedly low-technology sectors like bananas, beef, chicken, and pasta.

In sum, high technology relations have been the subject of disputes as governments supported their domestic industries, but they rarely escalate to trade wars. Why might this be? Busch seeks to explain the *variability* in trade disputes and rivalry: trade wars do not occur as often as one might predict and, when they arise, they do so in unexpected sectors. He does so by explicitly linking the likelihood of states risking trade war with the ability of their domestic economies to capture the benefits of subsidy programmes.²¹ In Busch's formulation (**Table 1**), two factors condition this ability: the extent to which an economy can consume spillovers; and the extent to which externalities can be contained within the domestic economy.²²

The first variable, consumption, seeks to repair a flaw in existing economic literature on externalities: the assumption that domestic firms are able to use the technologies flowing from rent capture policies. This assumption is dubious. Evolutionary economics has cast doubt on the simplistic view that technology is easily appropriable and instead argues that economies – and firms – have differential abilities to absorb and utilise new technologies.²³ Thus, it seems reasonable to assume that states will only pursue strategic trade and industrial policies if policymakers actually believe that their firms would be able to capitalize on the externalities generated. Busch also develops a second variable. Governments are more willing to implement STPs if the benefits flow disproportionately to domestic firms. Strategic trade and industrial policies are designed to benefit domestic firms, but if the externalities cannot be contained within the domestic economy – that is they cannot be internalised – then the state has little reason to support these sectors. Indeed, if externalities flow easily across borders then policymakers have an incentive to free ride on the strategic trade and industrial policies of others.

Busch then develops five theoretical options for states engaged in a competitive rivalry. The response of each state will be shaped by the extent to which each feels that

¹⁹ Sjöstedt (2001).

²⁰ Tyson (1993) and McGuire (1997). Interestingly, the engine makers were the only major "subcontractor" group to lobby on the Airbus issue. This lobbying arose because both Pratt & Whitney and GE were interested in excluding engines from any subsidy cap, while Rolls-Royce took exactly the opposite position.

²¹ Of course an additional element is that beyond a certain level reliance on foreign markets may deter exporters from filing countervailing duty petitions, in effect reducing the likelihood of trade escalation. See Pavcnik (2001).

²² Busch (1999), 16-17.

²³ See, for example, Ham and Mowery (1995) and McGuire (1999).

subsidizing will reap benefits that can be consumed and internalized. Thus, Busch asserts that only in two of the five scenarios will trade war ensue. The first, Beggar-thy-neighbour arises when both states feel that they can consume and internalise the externalities generated by the subsidy. A subsidy war escalates until, as in the case of the Boeing–Airbus rivalry, a bilateral agreement is reached to diffuse the row. In the second case, Favour-thy-neighbour, states can consume, but the inability of either state to internalize the externalities leads to limited intervention since the benefits of subsidies leak out into the international arena. In sum, Busch’s formulation directs us to understand whether Brazil and Canada thought that their economies could consume the benefits of aerospace activity and whether these benefits would be leak out into the international arena. The greater the ability to consume and internalize, the greater the incentive to go to war on behalf of the national champion.

Busch acknowledges that treating the state as a rational unitary actor is a limitation of his study, and at any rate he “hardly turns a blind eye to the domestic politics of strategic trade”.²⁴ Rational interest-based models in which interaction among domestic political forces drives policy outcomes and structural approaches in which a nation's stance on trade is solely determined by its relative international power, however, do not have a perfect track record in explaining, let alone predicting, policy outcomes. The theoretical work behind STP has also opened up space for multiple equilibria and path dependence, especially in games with few players and repeated interactions. When talking about public policies and business-government-interaction, therefore, the origin of political preferences and individual sequences of events – in other words, history – matter.

In her seminal contribution, Goldstein (1994) has shown that ideas are important in public policy formation since they provide "strategies" and "road maps" which policy makers use to maximize their interests. She maintains that interest maximization may motivate policy makers' choice of goals, but in a world of uncertainty decision makers must still make choices about how to achieve those goals. We therefore complement our analytical framework by taking into account the role of ideas, although not so much as forces that impose policy actions but rather as “a valuable supplement to interest-based, rational actor models”.²⁵

3. The role of the WTO

There is, however, another element missing from Busch’s formulation: the World Trade Organization. Busch’s model is state-centric and, though the argument for locating the source of STP preferences in the state is a powerful one, it may be that WTO rules help shape those preferences.²⁶ The WTO’s effect on international trade rivalries can be grasped at two levels. First, how do WTO rules influence the development of

²⁴ Busch (1999), 147.

²⁵ Jacobsen (1995), 285.

²⁶ He examines consultations and early settlement in GATT/WTO dispute resolution in Busch and Reinhardt (2001).

government support policies for important industries like aerospace? Second, does the operation of the WTO's disputes process alter state calculations concerning trade war?

Understanding the first of these requires us to recall how disciplines on government subsidy developed. In the WTO, a subsidy is a financial contribution by a state where it: transfers funds or liabilities (eg. loans or loan guarantees); foregoes revenue (eg. tax credits); provides goods and services other than for general infrastructure; or entrusts a private body to conduct the above and in doing so confers a benefit.²⁷ The subsidy must also be specific, in the sense that it is aimed at a particular firm or industry. WTO regulations concerning subsidies are themselves complex and do not constitute a prohibition on subsidy. Instead, the aim is to, 'refine, clarify and enforce previously murky distinctions between subsidies that distort trade and those that do not.'²⁸ Three categories of subsidy are delineated in the agreement: prohibited, actionable, and permitted. Prohibited subsidies include all types of export subsidies or those that have the effect of discriminating against imported goods. Actionable subsidies are in the first instance permitted provided they do not cause serious injury to other WTO members. The final category of subsidy is the permitted category. These, non-actionable subsidies, "could either be non-specific subsidies, or specific subsidies involving assistance to industrial research and pre-competitive development activity, assistance to disadvantaged regions, or certain types of assistance for adapting existing facilities to new environmental requirements imposed by law/or regulations".²⁹ WTO subsidy rules are designed to offer incentives to states to shift from direct, targeted support toward supply-side initiatives to increase innovative capacity of the economy.³⁰ Diffuse innovation policies are preferred to national champion policies; leaving aside the presumed efficacy of these policies, innovation policies are more likely to comply with the MFN principle.

The second important element of the WTO is the robust dispute settlement process. The new disputes settlement understanding is meant to be comprehensive, quick and binding. It is comprehensive in the sense that it covers all the WTO agreements. A failing of the previous GATT arrangement was that the various codes operated their own disputes procedures in addition (or competition) to the main disputes apparatus. Thus, a party cannot escape the disputes process by 'forum-shopping' or claiming exemption from the process. Strict time limits are set as well. This is to avoid having disputes drag on for years and thus damage the credibility of the system. Ideally, a dispute should not take more than eighteen months to resolve. Finally, the DSU is meant to be both difficult to block and binding. Once the appeals process has been exhausted, the Council will ratify the decision on a case unless a consensus emerges to block the report's adoption. Thus, the WTO process is the opposite of GATT's; whereas in GATT one state could

²⁷ WTO, *Agreement on Subsidies and Countervailing Measures*, Art. 1.1: 1.

²⁸ Kleinfeld and Kaye (1994), 43.

²⁹ WTO (1998).

³⁰ Bora, Lloyd and Pangestu (2000)

block a panel report's adoption, now a state must muster a consensus in favour of blocking. This is effectively impossible and panel reports – as amended by the Appellate Body – are *de facto* adopted as soon as they are announced. A member state is required under WTO rules to act to bring the offending regulation into conformity with WTO articles; should it fail to do so, the complainant states are allowed to retaliate.

This has led to a much more credible dispute settlement process. While the new DSU is an undoubted achievement, its more legalistic character may be impairing dispute resolution in a small – but important – set of cases. Although the DSU has solved many more disputes than its GATT predecessor, it is also worth noting that several cases have not been resolved and appear to have escalated. These include the EU-US disagreements on bananas and hormone-treated beef, as well as the regional aircraft dispute. Indeed, both Canada and Brazil have taken unprecedented legal steps by asking for panels to be reconvened and appealing arbitrator decisions. As Wolfe notes, the WTO itself encourages states to use the consultation stages of the disputes process as an opportunity to settle the problem amicably.³¹ Consultation is important to the WTO because the institution's members are sovereign states; compelling states to do something can be problematic as compulsion strikes at the heart of sovereignty. Moreover, as Goldstein and Martin warn, 'uncertainty about the costs of trade agreements on the domestic level suggests that fully legalized procedures that apply high, deterministic penalties for non-compliance could backfire, leading to an unravelling of the process of liberalization'.³² Thus the importance tied to negotiation and compromise as they allow states to resolve disputes amicably. Given the delicacy of the sovereignty issue, it may be that WTO's own interests are best served by injecting an element of judicial restraint into the panel procedures: indeed, there are some indications that this is already happening.³³ It reflects a paradox: vigorous activity by the WTO, rather than strengthening the trade system, might make states opt out of it in the face of domestic political pressures to preserve national economic policy space.

4. Bombardier and Embraer: two national champions?

The Brazil – Canada dispute has its genesis in the birth of a new aircraft market: regional jets plying routes generally shorter than 1,000 kilometers and with an average travel time of approximately one hour. Unheard of fifteen years ago – when commuter aircraft were propeller-driven machines – regional jet sales are booming. As industry liberalization made major carriers increasingly dependent on the traffic generated outside major hubs, “feeder” carriers were pushed into extending the length of the “spokes” (the cities that are served by each hub) and increasing the frequency of services. In addition, passengers started expressing a clear preference for jets, which are faster, more versatile, and less noisy and vibrant than turbo-props. The market has thus grown by more than 50 per

³¹ Wolfe (1999), 218.

³² Goldstein and Martin (2000), 621.

³³ Bronckers (1999), 556; also Jackson (1998).

cent between 1998 and 1999 and is estimated to equal at least US\$ 56bn in the next decade.³⁴ The already favorable prospects are made even rosier by the upcoming expiration of the 1980s agreements between airlines and unions in the United States. These specified that “feeder” carriers would not use planes with more than 70 seats, as the big-airlines pilots feared that if they did jobs would shift to these lower-cost affiliates. Although scope clauses were widely expected to be dying out by now, they seem to be strengthening. On the other hand, new, independent regional airlines, flying between medium-sized cities rather than connecting with the big carriers’ hubs, are growing in importance. This applies also to Europe, where scope clauses are rarer, although lack of airspace is another threat to the regional jet makers’ ambitions.

Both companies developed models to compete in this booming sub-sector of the civil aircraft market.³⁵ In 1989 Embraer decided to venture into what was then a niche market with a 50-seater. The ERJ-145 project was stopped in the early 1990s as the company sought new owners, but was accelerated after privatization as so much hinged on its success.³⁶ The new plane was presented at the 1996 Farnborough fair and secured its first contract with Continental Express.³⁷ In the meanwhile Bombardier had started producing the CRJ-200, which goes slightly farther and faster but is also two tons heavier, US\$ 2.5m dearer to buy, and 15 per cent more expensive to operate than the ERJ-145 (**Table 2**).³⁸ According to industry experts, the ERJ is superior in terms of avionics integration and is less noisy, while the CRJ can be used in badly-maintained airports.³⁹ In 1998 Embraer rolled out the first prototype of the ERJ-135, a 37-passenger version of the ERJ-145 with 96 per cent commonality, thus lowering development costs and making the smaller plane more attractive to operators already committed to its larger counterpart.⁴⁰ The 300th ERJ-145 was delivered to British Regional Airlines in September 2000, three years and eight months later. As a term of comparison, it took almost seven years for Bombardier to deliver the same number of CRJ-200s.

Bombardier

³⁴ “Regional jet market gains altitude over bigger rivals”, *Financial Times*, 17 April 2000.

³⁵ Interestingly enough, other companies that were producing turboprops in the 1980s either did not enter this segment or had major problems – Fokker did indeed go bust in 1996. The successful launches of Bombardier’s and then Embraer’s jets were followed by that of the 328, a 32-seater from Fairchild Dornier, an American-German firm, which however has nothing in the most popular, 50-seat range. In 1991 the EU blocked the takeover of De Havilland by the Franco-Italian ATR consortium on the grounds that the merged firm would have dominated the turbo-prop aircraft market. Bombardier eventually bought up its smaller Canadian rival. A simulation of the international market for regional jets, which ATR has not entered, could determine whether Brazilian export subsidies, insofar as they prevented Bombardier from acquiring monopoly power, have increased consumer welfare.

³⁶ Embraer planes, which were originally designated as EMB, gained the suffix ERJ in late 1997.

³⁷ The ERJ-145 is equipped with Rolls-Royce’s engines and flight instruments, such as engine-indication instruments, crew-alert systems, and digital flight control systems, produced by Honeywell.

³⁸ “Embraer’s little jet could circle the globe”, *Business Week*, 28 October 1996.

³⁹ “Na hora da venda, Embraer leva vantagem sobre a Bombardier”, *O Estado de S. Paulo*, 12 March 2001.

⁴⁰ For instance, pilots need only to be trained on any aircraft within a family in order to be certified to fly all aircraft within that family and the same ground support equipment can be utilized.

Montreal-based Bombardier, 60 per cent-owned by the founding family, emerged as a global player in the aerospace industry via a series of acquisitions that shifted the company well away from its roots as a snowmobile producer. Quebec not being exactly the industrial heartland of Canada, Bombardier has used this backwater status to become the province's industrial champion.⁴¹ Already in the 1970s, when the snow-mobile market slowed down in the wake of the oil-price increases, Bombardier bought an ailing railway-engine company with the help of aid from the Quebec government – and soon afterwards landed a large order to build the rolling stock for the Montreal subway. The company then moved into aerospace with the purchase of state-owned Canadair – an executive jet manufacturer – in 1986. The Federal government enabled the purchase by absorbing C\$ 1.2 billion of Canadair's C\$ 1.35 billion debt.⁴² Further purchases of Canadian (de Havilland), British (Short Brothers), and American (Learjet) firms followed. By the early 1990s, Bombardier's aerospace portfolio ranged from the propeller-driven cargo aircraft to glamorous executive jets. However, the firm's major coup was to identify the growth potential of regional jets. Again with funding assistance of the Federal government, the company decided to enter the regional jet market by leveraging its executive jet technology and experience.

Canada's approach to aerospace clearly underlines the belief that, in Busch's formulation, externalities generated can be consumed by domestic industry. Bombardier has become a "flagship firm", not only valuable in a monetary sense as a buyer or seller, but as a leader whose activities and strategy affect the competitiveness of the entire network.⁴³ With a strong competitive position in areas such as commercial and virtual flight simulators and landing gears, Canada boasts the fourth largest aerospace industry in the world.⁴⁴ According to the Aerospace Industries Association of Canada (AIAC), 90,000 people work in 250 aerospace manufacturing and service sector companies, with sales exceeding C\$ 20 billion in 2000. In 1999, the Canadian aerospace industry invested more than C\$ 2 billion, or about 12 per cent of revenue, on research and development and new infrastructure. This level of investment is about 15 per cent of all manufacturing R&D in Canada. This intensive R&D effort by the aerospace sector, in areas such as advanced composites materials and efficient fuel consumption technologies, finds application in other industrial sectors as well as contributing to Canada's sustainable development and climate change goals. Defending this cluster is a clear aim of Canadian trade policy.

Canadian governments – both federal and provincial – took a keen interest in the development of a domestic aerospace sector. History and geography provide part of the explanation; Canada boasted one of the world's largest air forces after the Second World War as the Allies made extensive use of Canada as a production site and training base.

⁴¹ "Subway to the sky", *The Economist*, 21 August 1997.

⁴² Killing and Miller (1993), 3.

⁴³ Rugman (1997).

⁴⁴ Aerospace Industries Association of Canada (<http://www.aiac.ca/industry/industryfacts.html>).

Until the cancellation of the Avro Arrow project in 1957, Canada even harboured hopes of developing an indigenous military aircraft capability. Vast distances made Canada an early user of telecommunications satellites.⁴⁵ However, a second reason for government involvement in aerospace arose in the 1980s as policymakers became concerned at Canada's reliance on primary industries. Moving Canada up the value-added ladder emerged as a policy objective, in both Ottawa and provincial capitals. Ontario's Liberal Premier David Peterson, in particular, established the Ontario Premier's Council, an advisory body composed of cabinet ministers and leaders of business, labour and academic communities, in April 1986, with the mandate to "steer Ontario into the forefront of economic leadership and technological innovation." In November 1987, during the annual first ministers' conference, Peterson proposed "that in order to increase productivity and international competitiveness Canadian governments should provide leadership in committing (funds) to R&D as a national priority".⁴⁶ As a result, the 1990s saw the development of various government incentive schemes designed to promote Canadian firms in selected industries as well as enticing foreign firms to locate in Canada.⁴⁷

One federal programme, Technology Partnerships Canada (TPC), identified aerospace, along with biotechnology and environmental technologies, as a target sector. TPC pays 25-30 per cent of the cost of developing new products, reimbursable through a system of royalty payments. It disbursed C\$ 631 million in research and development support to the aerospace industry. Some of this money did go to support Bombardier's regional aircraft production. In 1992, the TPC programme provided C\$ 38 million to support the development of the first regional jet model. In 1996, C\$ 87 million was provided for Bombardier's new, larger regional jet, the CRJ-70 (check designation). Foreign-owned suppliers also received support (**Table 3**). Canada also provided funding to support Bombardier's (and other exporters) sales efforts. In 2001, money provided by the TPC programme persuaded Roll-Royce plc to relocate small turbine R&D to Canada from the UK. To further encourage the development of new technologies, the government also offers a science and experimental research tax credit, reimbursing companies for R&D spending at the rate of about 30 cents on the dollar.

Bombardier's supply chain and product development strategy reflect two pressures evident throughout the industry. First, the perception of the sector as 'strategic' leads governments to encourage localised clusters to develop around the anchor firm. The complex production process also encourages suppliers to locate nearby. Bombardier has

⁴⁵ The commercial space industry – embracing satellite manufacture and operation - had been an important sector since at least the 1970s. Moreover, the industry's structure – high R&D intensity coupled to large-scale, costly projects – led to a state dominated industrial policy where key firms were reliant on government for both funding and policy direction. See Atkinson and Coleman (1989), 112.

⁴⁶ Government of Ontario (1988), *A Commitment to Research and Development: An Action Plan*, 2nd ed., Toronto, quoted in Palda (1991).

⁴⁷ The latter goal reflects increased Canadian concern about its slippage in the world rankings of FDI destinations. From 1985 to 1998, Canada's share of world FDI slipped from 9 to 4 per cent, and in North America from 24 to 12 per cent. See *Financial Times: Canada Survey*, 11 June 2001.

done well, but so have Canadian supplier firms (and for that matter universities) as the Toronto-Montreal corridor becomes a hub of aerospace activity. Invest Quebec, the province's investment promotion agency, does indeed boast the fact that Greater Montreal – with a proportion of the workforce employed in aerospace 1.5 times larger than in the United States and three times greater than in France – “is the only city within the global aerospace community where an entire aircraft could be assembled using only local suppliers – airframe, engine, avionics, undercarriage”.⁴⁸ Many of the firms are subsidiaries of European and American firms but, in addition to Bombardier, Canadian firms like CAE and Spar Aerospace have developed a global presence.⁴⁹ There are however growing concerns that problems in the lower tier have kept SMEs from enjoying this ride – or, perhaps more precisely, that public policies have paid too much attention to the demands from large firms and that structural problems beneath the OEM level have not received the attention they deserve. This, however, does not seem to be a concern for Bombardier, according to whose executive vice president for engineering and product development argues: “A Canadian supplier base *per se* is not critical to us. We are global, and we will hire the best suppliers, regardless of locations”.⁵⁰

The comments from Bombardier reflect another trend within the aerospace industry: the need to involve foreign firms in the production process. This has long been done for political reasons; offset arrangements were effective in gaining sales in export markets. However the escalating cost of aircraft production, coupled with increased technological sophistication, have pushed aircraft manufacturers to develop complex supplier relationships where component firms can sometimes become risk-sharing partners.⁵¹ Thus only half of the US\$ 800m spent on developing the Global Express long-range business jet (which can take eight passengers from New York to Tokyo in under 14 hours) has come from Bombardier; the rest comes from risk-bearing partners such as Mitsubishi, Rolls-Royce and Honeywell.⁵²

Thus, Canada's approach to aerospace builds on earlier efforts in telecommunications and commercial space and tries to accommodate two policy goals. First, industrial policy is aimed at creating an indigenous industrial capability. Bombardier is the most successful and prominent firm to emerge from this process, but the creation of an aerospace cluster around Montreal, in particular, is testimony to the broader success of this policy. However, as paradoxical as it might seem, Canadian policy eschews the autarkic industrial policy; indeed attracting foreign firms into Canadian clusters is a key goal of the Technology Partnerships Programme.

⁴⁸ “Canadian Aerospace: A Tale of Two Industries”, *Aviation Week and Space Technology*, 4 December 2000.

⁴⁹ In particular, CAE, which controls 75 per cent of the world's flight-simulator market, is investing some US\$ 100m in a new training centre in Guarulhos, São Paulo's international airport.

⁵⁰ “Canadian Aerospace”, *cit.*.

⁵¹ Mowery (1987).

⁵² “Subway to the sky”, *cit.*.

Embraer

The transformation of Embraer has been described as “a saga from agony to glory” and the company itself as a “scrappy, audacious, and canny survivor”.⁵³ Embraer’s story, like that of many other aerospace firms, begins with the military. As regards the aeronautical sector, concrete strategies involved a policy of market reserve, state financing, and technological support to private firms through the *Centro Tecnológico Aeroespacial* (CTA). Established in São José dos Campos in 1969, Embraer was majority-owned by the government, but it was governed by private law and headed for a long time by a competent, well-connected, and independent manager. Much bureaucratic red tape was avoided and a clear sense of corporate mission could emerge, although the relationship between the company and the Ministry of Aeronautics has been a very close one from the very beginning. The Brazilian government provided ample support to Embraer; for example favouring the firm in public procurement and developing government financing support mechanisms.

In the course of its 25-year history as a state-owned enterprise, Embraer used licensing and co-operation agreements to bring new resources and knowledge into the firm and develop a strong core competence – system engineering for producing aircraft. For the most part, Embraer shied away from manufacturing high-value, high-technology components and concentrated instead on designing the aircraft, producing fuselages, and assembling the final product. This learning process was initially accompanied by progress on other fronts – such as organizational and marketing skills – and allowed Embraer to become an important exporter, although the *net* foreign exchange impact was minor. Moreover, spill-overs, if any, never reached a critical level, not least for the obstacles to labor mobility posed by the dual-nature (civil and military) technology developed and used by Embraer’s technicians.

By the mid-1980s engineering considerations overtook other criteria in the mindset of senior management. Linkages between different parts of the company – and *a fortiori* between Brazil and the foreign affiliates that were supposed to provide advance warnings of what customers were demanding – weakened. The world’s recession in the late 1980s, the Brazilian government’s decision to cut export financing, and the drying up of the key Middle Eastern market also hit Embraer. Despite the opposition of the military and a long strike, in December 1994 a syndicate – that put together an aggressive New York investment boutique, one of Brazil’s greatest financial conglomerates, and two semi-public pension funds – bought a controlling 45 per cent stake for US\$ 89m. The government injected new capital, assumed the debt (US\$ 700m), and retained 6.8 per cent of the company’s stocks. Services such as site maintenance, transportation, catering, security, and machinery upkeep were outsourced and the payroll fell from a peak of 12,700 in 1990 to 3,600 in 1995.

⁵³ “Decolou!”, *Exame*, 30 June 1999” and “Brazil’s Hot Commodity? Not Coffee or Soccer”, *The New York Times*, 31 December 2000. This section is fully based on Goldstein (2001).

Riding on this trend, Embraer returned to profitability in 1998 after 11 consecutive years in the red.⁵⁴ Exports now make up 90 per cent of total sales and Embraer claims to lead unit sales in the world market for regional aircraft. Embraer has also become Brazil's biggest exporter, accounting for 3.5 per cent of total Brazilian sales abroad in 1999. In 2000, the company earned US\$ 297 million on revenues of US\$ 2.4 billion.⁵⁵ In 1999, a consortium of four large French aerospace companies (Aerospatiale-Matra, Dassault Aviation, Snecma, and Thomson-CSF) acquired a combined 20 per cent stake in Embraer, valuing the company US\$ 1 billion *circa*.

Not unlike Bombardier, the firm owes much of its late success in the ability to identify the growth potential of regional jets and leverage its existing technology and experience. The ERJ family's superior engineering performance partly results from the incorporation of the turbofan technology developed for the AM-X fighter program, while its price competitiveness owes something to the 30 per cent commonality (including the nose section and cabin) with the Brasília, a smaller plane developed in the 1980s. Public sector institutions such as BNDES and FINEP (*Financiadora de Estudos e Projetos*, part of the Ministry for Science and Technology) have actively supported this process, contributing 22 per cent and 100 per cent of the development costs of the ERJ-145/135 family and of the AL-X light-attack jet fighter respectively.

Embraer also understood the need to invest heavily in design and automated manufacturing processes and, as its archrival, learned to contract out the making of many important parts to a group of supplier-partners sharing the costs and risks of developing a new plane. In the case of the ERJ-145s being assembled at São Jose dos Campos, wings have been flown in from Spain, tail fins built in Chile, rear fuselages from Belgium, and cabin interiors from the United States. First-tier suppliers deliver whole systems – rather than discrete components – and take on the responsibility of managing the supply chain by sub-contracting discrete parts from lower-tier suppliers. This strategy should not only reduce Embraer's development costs and risks, but also, by reducing the number of its suppliers and easing logistics, allow it to concentrate in what it does better, i.e. design, assemble, market, and service the final aircraft. Some foreign suppliers (such as Pilkington Aerospace, Parker Hanefin, and Sonaca) have already set up operations in Brazil, while others (such as Latecoere) are planning to do so.

5. The WTO saga

The rivalry between Embraer and Bombardier started its steady escalation from the firm to the national level in 1996 when Canada requested the establishment of a panel to investigate the consistency of export subsidies granted under the Proex with the WTO

⁵⁴ Operating results have been positive since 1996.

⁵⁵ "Embraer Posts Highest Profits Ever", *Aviation Week and Space Technology*, 26 March 2001.

Subsidies Agreement (**Tables 4-5**).⁵⁶ The panel found that Brazil's measures were inconsistent with Articles 3.1(a) and 27.4 of the Subsidies Agreement. Brazil did not dispute that Proex payments were subsidies; its legal defence largely rested on the justification for these payments.⁵⁷ For its part, Brazil presented a complain in March 1997 in respect of certain subsidies granted by the government of Canada or its provinces intended to support the export of civilian aircraft. The complaint against Canada centred on the provision of export-contingent production and R&D subsidies. The panel found that the Technology Partnerships Canada research fund and the Canada Account for financing exports to developing countries were indeed inconsistent with Articles 3.1(a) and 3.2 of the Subsidies Agreement, but rejected Brazil's claim that such assistance constitutes export subsidies.⁵⁸

During a Team Canada visit to Brazil in January 1998, Prime Minister Chrétien agreed with President Cardoso to appoint Special Envoys to recommend ways to resolve the dispute. In May, the Envoys recommended that the two governments negotiate, within two months, a bilateral accord that is consistent with the WTO Agreement. The agreement would subject export financing programs to a "common template," using the OECD Consensus as a model; contain a dispute settlement mechanism, including annual consultations and recourse to a neutral and independent monitor; and provide for consultations with respect to domestic programs to determine their WTO consistency.⁵⁹ Talks between the two governments for a negotiated settlement, which were expected to be concluded within two months,⁶⁰ dragged on for years and broke down in May 2000. Brazil had proposed to compensate the Canadian economy for losses due to Brazilian subsidies, bring its subsidy into compliance with international standards,⁶¹ and negotiate a bilateral monitoring mechanism to ensure both sides comply with trading practices. But the Canadian delegation insisted on a specific time frame for a monitoring mechanism to be put in place, which Brazil declined on sovereignty grounds.⁶² The parallel idea of favoring Canadian exports of railways equipment and wheat also proved unviable.

⁵⁶ The dispute surfaced in December 1996, when Bombardier subcontracted a NATO US\$ 90m deal to Raytheon Aircraft for 24 T-6A-1 training, unexpectedly backing out of a order for Embraer's Super-Tucano.

⁵⁷ WTO, *Brazil – Export Financing Programme for Aircraft*, Report of the Appellate Body, (WT/DS46/AB/R), 2 August 1999, p.45.

⁵⁸ WTO, *Canada – Measures Affecting the Export of Civilian Aircraft* (WT/DS70/R), Geneva: WTO, 14 April 1999 at www.wto.org, hereinafter 'the Panel Report'.

⁵⁹ Although the details differ, the agreement embraces many of the principles underpinning the EU-US Airbus-Boeing agreement: special rules reflecting the particular circumstances of the sector; a consultation process; and a commitment to transparency.

⁶⁰ "The Government of Canada and Brazil Welcome Report of Special Envoys on Regional Aircraft", Department of Foreign Trade and International Trade, 7 May 1998, No. 111.

⁶¹ Proex currently provides a 2.5 per cent equalization subsidy.

⁶² "Canada, Brazil aircraft talks stall" *Financial Times*, 21 July 2000. The situation did not change during the following negotiating round in September ("Brasil detalha pacote de compensações", *Valor*, 27 September 2000).

In the meanwhile both countries appealed sections of respective panel reports, claiming that the panel had made mistakes in interpreting the ASCM agreement.⁶³ On 2 August 1999, the Appellate Body, having heard arguments from Canada, Brazil as well as the European Union and United States as third parties, issued its report on both cases, upholding all the findings of the panel.⁶⁴ Brazil appealed in May 2000, partly on the grounds that it could not breach its contractual obligations *vis-à-vis* Embraer's customers, the first country ever to do so against a verdict on compliance, thus taking the WTO into uncharted legal waters. In July 2000 an appellate panel ruled that Canada has complied with an earlier ruling to end illegal subsidies to Bombardier, but that Proex still violates international standards.

In January 2001, using Canada Account funds, Ottawa offered to loan a breathtaking US\$ 1.75 billion to Air Wisconsin to finance its acquisition of 75 Bombardier regional jets. The terms of the loan were exactly the same as Proex was offering. Enticed, Air Wisconsin has signed a memorandum of understanding with Bombardier.⁶⁵ Here is considerable uncertainty about the WTO-legality of the matching. While some Canadian officials claim that matching is allowed under WTO rules, there are suggestions that Canada is deliberately pursuing a WTO non-compliant policy to force a resolution.⁶⁶ In late February, there were bilateral meetings held in Geneva, but these broke up without any progress being made. Brazil then requested that a DSB panel be set up, challenging support for Bombardier sales from the Canada Account program, the Export Development Corporation (EDC) and the Province of Quebec.⁶⁷ In March, the WTO approved the setting up of this panel, which means that the dispute is likely to continue through most of 2001.

⁶³ Appeals can only be based on flaws in legal interpretation. Members are barred from introducing new arguments at the appellate stage.

⁶⁴ WTO, *Canada – Measures Affecting the Export of Civilian Aircraft: Report of the Appellate Body* (WT/DS70/AB/R), Geneva: WTO at www.wto.org, 2 August 1999, hereinafter 'the Appellate Report'.

⁶⁵ In April 2001, Bombardier announced that it had finalized a contract for the sale of up to 150 aircraft, made up of 51 firm orders, 24 conditional orders and 75 options. The value of the firm and conditional orders is about \$1.68 billion. The CRJ won out in part because it is expected to operate with fewer restrictions than the ERJ in summer at mile-high Denver airport, one of the carriers' hubs. In July Bombardier won a similar contract to supply 75 regional jets to Northwest Airlines. Canada's federal government agreed to loan Northwest Airlines as much as 80 per cent of the purchase price at the OECD reference rate.

⁶⁶ Telephone interview with DFAIT official, 5 July 2001; "Ottawa Meets Fire with Fire in Air Battle with Brazilians", *Financial Times*, 10 July 2001.

⁶⁷ The Export Development Corporation (EDC), as the name makes clear, exists to provide support, including export finance, to Canadian firms selling on international markets. The complaint states that Canada's grant or offer to allow Canada Account export credits to Air Wisconsin is a prohibited export subsidy under the GATT agreement. It also says that export credits, including financing, loan guarantees or interest rate support by or through the EDC, are prohibited export subsidies. The Brazilian complain also points to loan guarantees, equity guarantees, residual value guarantees and first loss deficiency guarantees provided by Investissement Quebec as being prohibited export subsidies. The last time a WTO panel examined the Crown corporation, it found that there was not enough evidence to support Brazil's contention that it offered illegal, cut-rate loans. Nevertheless, the panel reprimanded Canada for not being forthcoming with information about the EDC.

The renewal of hostilities came in spite of changes made to the Proex under which BNDES has agreed to use commercial interest reference rates (CIRRs). But even with this minimum interest rate in place, there are many other areas of continued dispute with Canada, including an argument over the tenor of loans on offer in support of regional jet sales. Canada would like to see a 10-year maximum term, which is also recommended by the OECD. Brazil expressed outrage that Canada was still challenging loan subsidies which Brazil regarded as having been covered by the tariff retaliation approved by the WTO, arguing that all transactions done before the December 1999 cut-off date were taken into consideration in the WTO retaliation ruling. It also argued that while a developed country like Canada can put 10-year financing in place, even if there needs to be a refinancing at that point, for one such as Brazil, the refinancing risk is too great. Brazil carries a sovereign rating of BB minus, which is shared by BNDES, which means that, instead of having access to the investment-grade market, it has to do its financing in the much more volatile junk bond market, where pricing and access are highly unpredictable. Yet another interim decision, taken in June 2001, said the reformed Pro-ex doesn't necessarily contravene international trade rules although the WTO decision panel also recognized that it would be quite possible for Brazil to abuse the program and subsidize sales of regional jets.

Future clashes between Boeing, Airbus, Embraer, and Bombardier over smaller aircraft are almost inevitable, so the days when Canada and Brazil fought their bilateral battle at the WTO may soon be over. The involvement of Boeing and Airbus will make things much more complex, so the chances are that the WTO panels will be busy hearing disputes, including those involving both Embraer and Bombardier, for many years to come.

6. The reasons for escalation: business-state relationships and ideas

How did the dispute reach such an astonishing impasse without attaining a negotiated settlement? In Busch's model, the beggar-thy-neighbor game – where both parties can consume and internalize – should result in a bilateral agreement on subsidy limits. This is exactly what happened in the Airbus - Boeing dispute during the 1980s: a subsidy agreement was negotiated in 1992. As we saw above, there was an attempt to secure this type of agreement in the regional aircraft case; however it was the first of many failed efforts.

It is a contention of this paper that an adequate explanation of the dispute requires an examination of both state-firm relations in Brazil and Canada and the ideas that underpin these relationships. While it is commonplace to regard the countries as very different – Canada as a developed state and Brazil as developing – they are remarkably similar in key respects. Both states are important producers of commodities and, in spite of their comparative advantage in these sectors, government policies reflect a desire to move up the value-added ladder. Relatedly, both countries have a relatively narrow set

of international competitive firms in these high-technology sectors. As a result of their status, these firms have considerable political weight. Finally, both states have a tradition of government intervention in the economy, coupled with a nervousness about the influence of the US over both their domestic economies and the international trading system.

The dynamics of state-firm relations

Canadian industrial and trade policy has tried to balance conflicting pressures: the small domestic market and the resultant dependence on exports; and a reluctance to embrace fully American *laissez-faire* economics. This has led to policy mix that is broadly supportive of international economic liberalization provided it accommodates some forms of government intervention. As Atkinson and Coleman argue, Canadian industrial policy is aimed, “at harnessing the best features of markets and protecting citizens against the worst.”⁶⁸ Winham argues that Canadian support for the Uruguay Round Agreement can be traced to the acceptance that the small Canadian economy would never offer sufficient markets for home firms; faced with this trade dependence, Canada naturally preferred a robust, international framework regulating global trade.⁶⁹ That said, Canada has traditionally resisted wholesale adoption of the ‘American model’ of free market capitalism. Government spending as a percentage of GDP has generally approached European levels – 40 per cent – rather than lower US levels. Moreover, as Atkinson notes, income distribution is far less inequitable in Canada than in America. “We have two North American countries, sharing a long frontier, with considerable cross-border economic flows, where the degree of integration has increased with NAFTA, and yet the time paths of income inequality are noticeably different.”⁷⁰ Part of the explanation is political. In a country whose popular culture is highly Americanized, political institutions and practices assume importance. As O’Brien notes, greater acceptance of state intervention in the economy is one of the few things that differentiates Canada from its southern neighbour. “If markets were entirely open and there was little difference in the organizing principles of the US and Canada, the existence of a separate countries would no longer be required.”⁷¹ In short, the state remains an important element in Canadian political economy.

On a similar vein, Embraer’s emergence as a corporate success story cannot be understood in isolation from the dramatic evolution of the Brazilian economy from protectionism to the embrace of a ‘new economic model’ (NEM) of privatization, liberalization of trade and finance, and openness to international investment to replace discredited import substitution policies.⁷² Unlike early liberalizers such as Chile, Brazilian elites preferred to delay liberalization until 1990 – some ten years after NEM

⁶⁸ Atkinson and Coleman (1989), p. 195.

⁶⁹ Winham (2000).

⁷⁰ Atkinson (2001), p. 434.

⁷¹ O’Brien (1997), p. 44

⁷² Reinhardt and Peres (2000)

had first arisen - and initiated privatization only in 1994.⁷³ This reluctance grew out of a blend of political and economic factors. Politically, Brazilian elites were reluctant to make decisions about which parts of Brazilian society would bear the inevitable adjustment costs associated with the fiscal austerity demanded by the international markets. Historically, this choice had been avoided by recourse to inflationary fiscal policy; the Real Plan instituted by Cardoso represented a break with this tradition.⁷⁴ Economically, there remained concerns about the swamping of domestic producers by foreign multinationals. Brazilian firms operating in their large but protected domestic market had stagnated and fallen behind foreign firms in key technologies. Liberalization might help address this, but only if foreign firms transferred technology and skills; market opening was blended with incentives to achieve this.⁷⁵

Brazilian liberalization in no sense represented a defeat for domestic businesses. Some businesspeople did oppose liberalization and worked to stop it, but other elements of the business community saw an opportunity to break out of the domestic market and increase profitability via exports.⁷⁶ Maintaining the liberalization process has meant privileging business ahead of labour in the policy process. As Phillips notes, “business sectors have come to form the backbone of political support for reforming governments [in Latin America]”.⁷⁷ But this political support in turn rests on how well Brazilian firms cope with the restructuring that liberalization brings. Micro-level analyses of Latin American firms present us with an interesting – and highly complex – picture. There has been significant export growth, signaling that firms are indeed grasping the nettle of international competition. However, Reinhardt and Peres note that export growth has occurred mainly in traditional industries like natural resources. Moreover, there is little evidence that firms are shifting resources out of these areas and into more technologically-intensive sectors.⁷⁸ In short, liberalization might be reinforcing rather than reducing the region’s traditional reliance on commodities. The exception here is Embraer; it is one of the few Latin American firms to have succeeded in leveraging foreign technology and indigenous managerial expertise for international success. It is this position that provides Embraer with its political clout.

The role of ideas

Thus, while both countries share an approach to economic policy that recognizes the need for public support to private entrepreneurship, in the export subsidy imbroglio they have found themselves at loggerhead as they defended different principles. Canada has argued that it was left with no options other than ask the WTO permission to

⁷³ Goldstein (1999), p. 680.

⁷⁴ Amann and Baer (2000), p. 1805.

⁷⁵ Dedrick *et al.* (2001), p. 1204.

⁷⁶ Goldstein and Schneider (2001). Doctor (2001) presents an interesting case study of conflicting business interests in the area of port reform.

⁷⁷ Phillips (2000), p. 290, brackets added.

⁷⁸ Reinhardt and Peres, (2000), pp. 1556-57.

retaliate. Her main argument is that in so doing, far from weakening the rule-based system, it is providing a public good to all WTO members. According to one of Ottawa's legal advisors, "Canada is bound by the world trading system to ensure that the WTO Embraer decision be enforced. [...] To stop now, bury the hatchet and leave the WTO decision un-enforced would be detrimental to the whole WTO trading system. Failure to do so, would engender a system which, in the long run, favours countries that have considerable political and economic strength irrespective of the merits of the dispute".⁷⁹ Bombardier's market position was also a crucial element in the decision. As one Canadian official made clear, under no circumstances could Canada accept a situation where Bombardier lost market share unfairly, in a market it had created.⁸⁰ A further reason why the Canadian government is in favor of a rules-based regime is because it feels the need of the full weight of the regime to defend the country's interests against American protectionist surges.

Bombardier clearly enjoyed widespread support within the domestic industry, although some of the largest and most influential advocates for business, such as the Business Council on National Issues, the Canadian Manufacturers & Exporters, and the Canadian Chamber of Commerce, have refrained from taking any official position in the dispute.⁸¹ The reason given by one Canadian official for this support was enlightened self-interest – "other Canadian companies could find themselves the subject of WTO action in the future".⁸² AIAC, the aerospace industry association, has endorsed the Federal government's decision to retaliate, arguing that the dispute is about a level playing field for all firms and all nations, in which the fundamental integrity of a rules-based global trade regime is at stake.⁸³ This despite the explicit understanding that a number of the industry's members – possibly starting from the smaller ones that may be the most interested in selling components to Embraer – could be hurt by this course of action.⁸⁴

A less charitable interpretation was that subcontractor firms feared that appearing to oppose Bombardier would have consequences for their ability to get future business from the company. CAE, the Canadian flight simulator manufacturer, remained on the sidelines and took no official position, reflecting perhaps that fact that the firm counts both Embraer and Bombardier as customers.⁸⁵ The attitude of foreign firms toward the Canadian action also gave the Canadian government scope for action. While several

⁷⁹ Colas (2001).

⁸⁰ Telephone interview with Department of Foreign Trade and International Trade (DFAIT) official, 5 July 2001.

⁸¹ The President of the Canadian Association of Importers and Exporters said "We realize governments have to wave big sticks and everything else, but we're being held hostage and we have nothing to do with aircraft" ("Diplomat talks tough on trade with Brazil, *The Globe and Mail*, 2 February 2001).

⁸² Telephone interview with DFAIT official, 5 July 2001.

⁸³ "Aerospace Industry supports government decision to seek WTO authorization for retaliation against Brazil", AIAC news release, 5 December 2000 (<http://www.aiac.ca/about/pressreleases/pr12052000.html>).

⁸⁴ The Trade Business Council, one of AIAC's subcommittees and the one more closely involved in framing the country's official position at the WTO, is chaired by the president of Rolls-Royce – the firm that supplies engines on the ERJ 135, ERJ 140, and ERJ 145, as well as the new Embraer ECJ Legacy and the Brazilian SIVAM military surveillance aircraft – in Canada.

⁸⁵ Telephone interview with DFAIT official, 5 July 2001.

Canadian affiliates expressed concern and ‘nervousness’ in the early stages of the dispute, the WTO decision in respect of TPC might actually have emboldened Canada. This was because foreign investors could be reassured that new TPC aid would be fully WTO-compliant; the firms did not have to worry that the incentives that got them to Canada in the first place might be suddenly wound up.⁸⁶

On the other hand, although the government claimed that the beef ban was not related to the aircraft subsidy battle, the startling escalation in hostilities raised fears that Canada was going too far in its support for Bombardier.⁸⁷ The suspicion was that the close ties between the company and the government influenced Ottawa’s willingness to be aggressive.⁸⁸ Already in 1997, when the government took the company’s defense in an investment dispute in Mexico, “a number of eyebrows were raised in Ottawa by Chretien’s energetic pursuit of Bombardier’s interests”.⁸⁹ When Ottawa provided low-interest loans to help close the Air Wisconsin sale, complaints were heard loud and clear from opposition leaders and taxpayer advocates.⁹⁰ Brazil’s theory is that Canada was ready to sign on the package until it talked to Bombardier, which nixed the agreement.⁹¹ Of course the fact that a firm like Bombardier characterized by very high asset specificity, as indicated by R&D intensity and job immobility, may forcefully engage in political lobbying is to be expected.⁹² But the boundaries between the defense of high principles by government and the risk of capture by interested parties are never set in stone.

At the same time it is evident that Brazil cannot let one of its preciously few international superstars be run over. Embraer may not score spectacularly high on the internalization and consumption boards, but it still generates hard currency receipts, develops indigeneous technology, and induces foreign companies to invest in Brazil. When the appellate review upheld Canada’s argument that the Proex-based contracts with airlines had to be unwound, Brazil’s argument was that Embraer had signed binding contracts with airlines for some 900 aircraft with a value of US\$ 3 billion; the company could not renege on its legal obligations. As one industry observer noted, asking Embraer to

⁸⁶ Telephone interview with DFAIT official, 5 July 2001.

⁸⁷ Or, as *The Globe and Mail* put it, “Canada is fast taking on the role of the bratty brother who steals your toys and hides them because Mom likes you best. That is what the woeful conduct of its dispute with Brazil over sales of passenger jets amounts to” (“Our war with Brazil”, 9 February 2001).

⁸⁸ “The dangers of war”, *Mac Lean’s*, 19 February 2001 quoting Alan Alexandroff, research director of the Munk Centre for International Studies.

⁸⁹ See “Running off the Rails”, *Time*, 13 October 1997 and “‘Bottomless hypocrisy’ demands scrutiny”, *The Ottawa Citizen*, 21 March 2000.

⁹⁰ The Canadian Taxpayers Federation, for example, asked “Why should individual taxpayers in Halifax or a small company in Calgary continue to subsidize deep pocketed transnational corporations such as Bombardier?” (“Taxpayers respond to Tobin’s funding announcement favouring Bombardier”, 10 January 2001).

⁹¹ Interview with Brazilian Foreign Affairs Ministry official, Brasília, 17 May 2001. Bombardier directors include Andre Desmarais, Prime Minister Chretien’s son-in-law; former Liberal cabinet member Jean-Pierre Goyer; and former Quebec Liberal leader Daniel Johnson. Pierre MacDonald, currently a director of the Export Development Corp., is a former Bombardier executive.

⁹² See for example Alt *et al.* (1999).

comply with the ruling and unwind the contracts was essentially asking the company to put itself out of business.⁹³

Equally important, Brazil has also tried to widen its support base by acting as a champion of developing countries' rights. In this it purports to be supplying a public good, just like Canada does when arguing that not to enforce the WTO decision would be detrimental to the global trading system. The main claim made by Brasília is that the ASCM unfairly allowed countries to use only export credit rates that comply with the OECD Arrangement, which are "not suited to the needs and specificities of developing countries or of any non-participant". The criticism runs at two levels. On the one hand it questions the fairness of imposing OECD norms on countries that did not sit at the negotiating table.⁹⁴ On the other hand it casts doubt on the use of virtual values, such as the CIRR, when financial markets have now developed much more sophisticated instruments for export financing.⁹⁵ Other developing countries, such as India, Tanzania, and Jamaica, go beyond and propose that developing countries be authorized to use subsidies for regional development, export diversification, and technological upgrading that are currently prohibited by the ASCM.⁹⁶

If media reactions are any indication, Brazilian elites have unflinchingly stood behind the government's strategy of not yielding to Canada's demands,⁹⁷ although some observers have noted that the problems the country encountered in defending its commercial interests in international organizations relates to the commitment of its diplomatic body to ideologies opposite to free trade itself.⁹⁸ A Canadian negotiator noted that his country had no natural allies within the Brazilian business community who might intervene with Brasília on Ottawa's behalf.⁹⁹ Interestingly, concerns in business circles have come less from exporters to Canada than from other heavy users of Pro-ex that feared that the excessive publicity given to the scheme could alert competitors.¹⁰⁰

⁹³ Allen and Collitt (2000), 12.

⁹⁴ The Arrangement, developed under the auspices of the OECD, came into being in April 1978 following agreement among its Participants. The Arrangement is a "Gentlemen's Agreement" among its Participants. Although it is not an OECD Act, it is incorporated, via a Council Decision, into European Community law. The Arrangement receives the administrative support of the OECD Secretariat.

⁹⁵ See Azevêdo (2001), by a Brazil's senior delegate at the WTO.

⁹⁶ "As regras unilaterais da OMC", *Gazeta Mercantil*, 26 July 2000.

⁹⁷ See "Negociação, sim, ultimato, não", *Gazeta Mercantil*, 13-14 May 2000; "O impasse Brasil-Canadá", *O Estado de S. Paulo*, 1 October 2000; and "Guerra no ar", *Folha de S. Paulo*, 30 January 2001.

⁹⁸ See Pio (2001).

⁹⁹ Telephone interview with DFAIT official, 5 July 2001.

¹⁰⁰ "Itamaraty S/A", *Istoé*, 31 July 2000.

7. Conclusion

For all their enmity, Bombardier and Embraer have much in common. Both firms are regarded within the industry as well-run companies and have benefited from strong, imaginative leadership, which has *inter alia* produced excellent relations with each country's policy-makers. Both firms identified the promise of the regional jet market ahead of rivals. However, for all their business acumen, in each case government assistance has been vital. Both Brazilian and Canadian governments absorbed debt and provided other means of financial support. Prima facie, our case almost perfectly complements one of the disputes studied by Marc Busch, that between the EU and the US in the aircraft industry. There externalities could be consumed and internalized and yet there was no trade war. In our case, although the two national champions heavily depend on imports, Embraer admittedly more than Bombardier, and are correspondingly limited in their capacity to consume, they did wage a trade war.

The increasing use of risk-sharing arrangements, which both Bombardier and Embraer undertake, raises questions about Busch's second variable – internalization.¹⁰¹ If foreign firms are free-riding on nationally-funded programs, would states be willing to go to trade war over them? The willingness to lure foreign firms, especially in Canada but increasingly in Brazil as well, is testimony to policy-makers' belief that, on balance, externalities generated by these affiliates will remain in the host country and diffuse throughout the rest of the economy. Seen in this light, it becomes clear why Canada would wish to defend its flagship firm – Bombardier – from foreign threats. If the game played by Canada and Brazil is indeed Beggar-thy-neighbor (both can consume and internalize) then the expected subsidy agreement remains elusive.

However, if Canada can both consume and internalize, but Brazil can only consume, then this game is not accommodated in Busch's existing framework. Busch's aerospace case – Airbus versus Boeing – bears an important difference with the one we consider. Both the EU and the US are capable of both consuming and internalising benefits as both actors had large and sophisticated aerospace industries *before* the subsidies became a trade issue.¹⁰² Neither Brazil nor Canada has the same capability; both are much more reliant on foreign subcontractors and international alliances. They are not able to internalize subsidy benefits to the same extent.

We argue that in both Canada and Brazil ideas have an important place in explaining why this dispute drags on. Canada has presented itself as a champion of the rule-based trading system, Brazil as the herald of the rights of non-OECD to be treated with greater fairness on the global arena. At the same time, both countries are insecure about their

¹⁰¹ He, however, is careful to state that benefits do not have to remain entirely within national borders – only that they remain 'in disproportionate measure' within the country (Busch 1999, 18).

¹⁰² The percentage of American-made parts of Airbus aircraft dropped as newer models were developed and European subcontractors got more business. American policymakers took this as evidence that European subsidies were profit shifting. McGuire (1997).

economic structures. Canada is desperate to throw off its mantle as a commodity-dependent economy relying on a depreciating currency to maintain export competitiveness.¹⁰³ Brazil has few internationally competitive firms and has only recently embraced liberalization as a policy goal. Hence the point is not that these ideas – which can crudely be labeled “multilateralism” and “developmentalism” – are intrinsically cogent. Rather their importance stems from the functional role they play in reconciling “the interests of elites active in the institutions of [the two states] so that they can form a coalition capable of enacting” them.¹⁰⁴ Bombardier and Embraer are corporate success stories in countries in need of internationally competitive domestic firms. The willingness of Canada and Brazil to defend these firms demonstrates that governments, while embracing liberalization, are not agnostic about the nationality of internationalised firms.

The research also poses the question of whether the WTO process has actually made a resolution of the dispute more difficult. As Goldstein and Martin note, it is misleading to think that increased legalization within the WTO regime necessarily leads to higher levels of trade liberalization: obliging states to maintain liberal commitments may have high domestic political and economic costs.¹⁰⁵ One result of the binding nature of WTO dispute settlement is that the costs of losing have risen dramatically. As we saw in the case of Embraer, losing the case meant the possible loss of 900 sales; the firm simply could not accept a defeat of this scale. The case illustrates how losing can become politically and economically unviable for states; faced with few palatable options, political leaders choose to drag out a dispute. For that matter, ‘winning’ posed problems for Canada; any retaliation on the scale allowed would have grave consequences for a large number of Canadian firms. The compensation figure represented some 25 per cent of total Brazilian – Canadian trade; it is inconceivable that firms not party to the dispute would be unaffected. In this situation, the DSU’s credibility suffers as neither party can develop a politically acceptable way out of the process. Both Canada and Brazil have made aerospace a cornerstone of their technology policies and neither can afford to abandon the field to the other side.

Finally, while the focus of this paper is not normative, we think that at least one broad policy implication can be drawn from this case, how to better take into account the concerns of developing countries and hence smooth the way towards further trade liberalization? **To be completed**

¹⁰³ Martin and Porter (2000) note that Canada has failed to develop truly competitive firms with distinctive core competencies; instead, they argue, Canadian firms continue to rely on imitation and low cost.

¹⁰⁴ Jacobsen (1995), 294.

¹⁰⁵ Goldstein and Martin (2000), 604.

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Table 1. State incentives for strategic trade policies

| | | |
|--------------------------|----------------------|-------------------|
| Internalisation → | NO | YES |
| Consumption ↓ | | |
| YES | Limited Intervention | Full Intervention |
| NO | Non Intervention | |

Source: Busch (1999), Fig. 2.1.

Table 2: A Comparison of Models

| | Bombardier CRJ-200 | Embraer ERJ-145 |
|--------------------------------------|---------------------------|------------------------|
| No. of Passengers | 50 | 50 |
| Wing span (ft.)/ Wing area (sq. ft.) | 69.7/560 | 65.8/551 |
| Cruise speed (mach) | 0.77 | 0.78 |
| Range (miles) | 1134/1893/2307 | 1186/1771 |
| Year of launch | 1992 | 1995 |
| Engines | General Electric CF34-3B1 | Rolls-Royce AE 300&A |
| Weight (kgms) | 13,740 | 12,007 |
| Price (US\$ m) | 21.0 | 18.5 |
| Units sold | | |
| Cumulated market share | | |
| Market share 2000 | | |

Sources: *Aviation Week and Space Technology*, Aerospace Source Book, 17 January 2000, 70-71 and companies.

Table 3. TPC programme funding for Canadian affiliates of foreign MNEs (indicative list only)

| Company | Funding (C\$ million) | Purpose |
|--------------------|------------------------------|---|
| Canadian Marconi | 1.1 | Control display unit for military helicopters |
| Messier-Dowty Inc. | 3.48 | Development of landing gear for Raytheon business jet |
| Sextant Avionique | 9.9 | Avionics systems for Bombardier aircraft |
| Allied-Signal | 3.7 | Development of components for small turbofan engines |

Source: Government of Canada, Technology Partnerships Canada: News Release Archive.

Table 4. A synthetic view of the regional aircraft dispute

| | Date | Description |
|------------------------------|------------------|--|
| | January 1998 | President Cardoso and Prime Minister Chrétien agree to appoint Special Envoys to recommend ways to resolve the regional aircraft dispute. |
| Report of the Special Envoys | 7 May 1998 | Recommendation that the two governments negotiate, within two months, a bilateral accord that is consistent with the WTO Agreement, subject export financing programs to the OECD Arrangement on export credit rates, and contains a dispute settlement mechanism. |
| Canada's request to the WTO | 10 July 1998 | To examine whether the "Interest Equalization" component of Proex constitute subsidies within the meaning of Article 1 of the Subsidies and Countervailing Measures (SCM) Agreement and whether, insofar as they are contingent on export performance, such subsidies contravene Article 3 of said Agreement. |
| Brazil's request to the WTO | 10 July 1998 | To examine export financing by the Export Development Corporation and Industry Canada support for research and development. |
| Panels appointment | 22 October 1998 | The European Union and the United States reserved their rights to participate in both panel proceedings as third parties. |
| Dispute panel decision | March 1999 | Brazil afforded Embraer an illegal subsidy with its Proex scheme and should withdraw it without delay, i.e., within 90 days. |
| Dispute panel decision | 14 April 1999 | Some Canadian subsidy programmes supporting Bombardier violated the SCM Agreement and should be withdrawn without delay. There is not sufficient cause to pursue Brazil's complaints about submarket-rate financing by EDC any further. |
| Appellate body decisions | 2 August 1999 | Upheld the initial findings in both cases. |
| Brazil's status report | November 1999 | The interest rate equalization payments under Proex would be granted only to the extent that the net interest rate applicable to a transaction under that program was brought down to the appropriate international "benchmark" (and not below, as had sometimes happened in the past). |
| Canada's status report | November 1999 | The Canada Account financing of regional aircraft exports was discontinued immediately, and all existing obligations to disburse TPC funds to that industry terminated. |
| Bilateral Agreement | 23 November 1999 | Canada and Brazil both filed notices to the WTO requesting that the original dispute settlement panels be reconvened to decide if the two countries have complied with the panel decisions. |
| Compliance panel ruling | May 2000 | The Proex-based sales (some 900 Embraer aircraft) cannot proceed |
| Appellate body decision | 21 July 2000 | Upheld the previous decision. |
| Arbitration panel decision | 28 August 2000 | Canada is entitled to impose tariffs on Brazilian goods worth US\$ 230 million per year until a bilateral accord is concluded |
| | 16 February 2001 | Canada can impose trade sanctions on Brazilian goods worth US\$ 226 million a year. |
| Interim decision | 20 June 2001 | The reformed Pro-ex doesn't necessarily contravene international trade rules. In order for Brazil not to abuse the program, financing must be at market rates plus a premium for risk; loans must be for no longer than 10 years; and the Pro-ex loans must cover no more than 85 per cent of the purchase at stake. |

Table 5. Synthetic view of countries' positions

| Issue | Brazil | Canada |
|----------------------|--|---|
| Export subsidies | <ul style="list-style-type: none"> • Brazil is a developing country and has the right to subsidize exports to offset the higher country risk premium. • Developing countries had not negotiated the OECD Arrangement on export credit rates. • Proex works so as to cancel out the beneficial effect of Canada's support to Bombardier. • The ability to lease a Bombardier plane for the same monthly payment as its Embraer counterpart, when the former costs more to manufacture, constitutes <i>prima facie</i> evidence of a sub-market rate for EDC financing. • Canada is as deep into the export subsidy game as Brazil, but it does it much more quietly through the secretive EDC, which doesn't have to report who it loans money to and under what conditions. | <ul style="list-style-type: none"> • Proex is being applied to firms that are obtaining financing outside of Brazil. • Embraer's customers (e.g., Comair, Skywest, ASA) had acknowledged that Proex brought down their financing costs by about 1.8 to 3.5 per cent below market-based rates. • While Brazil is a developing country and therefore entitled to special and differential treatment, Proex had been expanded instead of being phased out as required by the SCM. • Compensation, rather than sanctions to Brazilian exports, is conditioned on reducing Proex on orders contracted for but not delivered. |
| Production subsidies | <ul style="list-style-type: none"> • The provision of TPC risk-capital to the Canadian regional jet industry was explicitly conditioned on its high export-propensity and therefore constituted a banned export subsidy. • Canada did not disclose important information to the initial WTO panel inquiry. | <ul style="list-style-type: none"> • TPC focused on general economic benefits to Canada rather than export propensity <i>per se</i>. |
| Countermeasures | | |