

Defying gravity: The Imperial Economic Conference and the reorientation of Canadian trade



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Abstract

In the wake of the Great Depression, the Canadian government embarked on a stunning reversal in its commercial policy. A key element of its response was the promotion of intra-imperial trade at the Imperial Economic Conference of 1932. This paper addresses whether or not Canada was able to defy gravity and divert trade flows towards other signatories at Ottawa. The results suggest that the conference was a failure from this perspective. Potential sources of this failure include unreasonable expectations about the likely reductions in trade costs and a neglect of key considerations related to certainty and credibility.

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1. Introduction

The collapse of international trade in the wake of the Global Financial Crisis has led to fundamental reconsiderations of the structure and sustainability of the global economy. Although the sources of this trade bust are still debated, changes in the composition of output and trade, the role of inventories, and issues related to trade credit and the spread of cross-border supply chains are all clearly implicated (cf. [Alessandria et al., 2010](#); [Bems et](#)

[al., 2010](#); [Chor and Manova, 2012](#); [Eaton et al., 2010](#); [Levchenko et al., 2010](#)). What has been less contentious is the appropriate response of policymakers with respect to commercial policy. In part, a firm and long-standing commitment to the cause of free trade ensured the quick recovery of international trade volumes to pre-crisis highs. This recent experience, of course, comes in marked contrast to that of the interwar period.

In this paper, Canada's engagement with international markets during the interwar period is explored.

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In particular, the implications of the Canadian policy response in the wake of the Great Depression and the erection of foreign trade barriers, most notably in the form of Smoot-Hawley in the United States, are considered. Apart from home-grown tariff legislation, a key element of the Canadian response was the promotion of intra-imperial trade at the Imperial Economic (or Ottawa) Conference of 1932. This represented a stunning reversal in Canadian commercial policy which had previously emphasized maintaining continued access to US goods and markets. Thus, drawing on a well-established literature in international trade, the primary question which this paper seeks to address is whether or not Canadian trade was able to defy gravity—that is, defy the attractive force for Canadian exports and imports exerted by the economic mass and geographic proximity of the US—and divert trade flows towards other signatories at Ottawa in 1932.

The choice of Canada as the observational unit is motivated by a number of reasons. First is the sheer size of the Canadian–US border trade and its long-running preeminence. By 1927, Canada had surpassed the United Kingdom as the United States' largest trading partner (Jacks et al., 2011), a position it holds into the present day and which represents the largest bilateral trading relationship over the past 80 years.¹ What is more, this single border registered roughly 5% of all world trade in the interwar period. At the same time, the Canadian response to the combined pressures of the Great Depression in general and Smoot–Hawley in particular was to embark on its most pronounced reversal in commercial policy to date. Documenting the evolution of this vital trading relationship is, thus, important not only for our understanding of history, but also of the context of commercial policy in the present.

Second, Canada provides insight into the dilemma facing small- and medium-sized economies which are dominated by a few—generally large and proximate—trading partners. Historically, we can place areas like Australasia, the Low and Nordic Countries, and Latin

America in this category. In the contemporary setting, this may become more binding for the East Asian Tigers, Japan, and—again—Australasia with the rise of China as a dominant player in international trade. The particularly Canadian experience explored here serves to highlight the tension between the benefits of integration which are often hard to identify and the more readily felt costs which are borne in the face of significant reversals in a dominant trading partner's commercial policy and economic fortunes. Such costs may come in the form of the loss of electoral support for political parties which have previously championed the cause of further integration or in the form of the loss of output and productivity attendant on the misallocation of capital in the presence of intermediate inputs and integrated economies (Bond et al., 2013). In any case, the topic of diversifying trade partners uncannily emerges any time progress along these lines falters. Unfortunately, little of the debate surrounding this decades-long issue addresses the feasibility—as opposed to the desirability—of such a re-orientation of trade flows. This paper represents a step forward in this direction.

Finally and more generally, the experience of commercial policy in the interwar period has proven to be one of the few decisive lessons learned from economic history. A consensus has emerged within the economics profession, across the political spectrum, and more haltingly—but more surprisingly—throughout the electorate. This consensus holds that while broad-based protectionism may perhaps bolster the domestic macroeconomy in its direct effects, indirectly it will almost certainly raise the counter-protectionist ire of other nations, suggesting little is likely to be won in following this path. Additionally, the experience of the interwar with respect to unilateral changes in commercial policy initiated the pronounced move towards multilateralism in the post-World War II period (Baldwin, 2009; Snyder, 1940). Therefore, a further consideration of the policy disaster of the interwar may contribute to a wider appreciation of this consensus view.

Section 2 below sets the scene leading up to the events surrounding the period from 1929 to 1932. It reveals that the Canadian economy was highly exposed to changes in commercial and economic conditions in the United States and, thus, unprepared for the Great Depression. This fact might help explain why the Canadian economy had not regained the economic ground lost during the depression even as late as 1939. Sections 3 through 5 represent the main contribution of the paper. Canadian trade statistics are particularly rich for this period and allow us to explore the effects of

¹ This blanket statement has a few notable exceptions when the United Kingdom–United States bilateral trading relationship reasserted itself. These came in 1933 when Canadian–US commercial and diplomatic relations were close to their nadir and the war years of 1940 through 1944 when the US engaged in an unusually large and highly unrepresentative export trade with the UK. Putting things in further perspective, the volume of Canadian–US trade still held a commanding 15% lead on the runner-up, namely China and the US, in 2012.

the 1932 Imperial Economic Conference on Canadian bilateral trade at a highly disaggregated level. The results suggest that the conference was a failure in that the cause of Canadian trade with the rest of the Empire seems to have been furthered little in its wake. The final sections seek to identify the sources of this failure as well as place the results in a broader context. They demonstrate that the implicit goals of the conference carried with them unreasonable expectations about the scale of the attendant reductions in bilateral trade costs and, thus, the scale of effects on bilateral trade flows. Furthermore, the discussion at Ottawa neglected key considerations with respect to certainty over the likely course of Canadian commercial policy and credibility in maintaining any set of provisions emerging from the conference itself.

2. Canadian Trade: Policy and Performance, 1921–1939

Riding the tide of an immigration and investment boom in the early 1920s, the Canadian economy experienced significant growth in this period, with real GDP per capita rising 50.9% in the years from 1921 to 1929 (Maddison, 2004; Safarian, 1970). This growth was also mirrored in its trade statistics: Canadian real exports and imports grew by 30.3% and 20.8%, respectively. Underlying this trade boom was the development of new resource exports such as newsprint and non-ferrous minerals to the United States as well as a durable consumer goods sector, especially for automobiles, which serviced both the market of Canada and the British Empire (Pomfret, 2000). However, forces were mounting even from the beginning of the decade which would draw this effervescence, especially in the external sector, to an end.

Of particular note in this respect was the rise of protectionist sentiment within the United States beginning with the tariff bill of 1922. In response to deteriorating conditions in world agricultural markets following World War I, the Fordney–McCumber tariff soon found room to incorporate wider calls for industrial protection. Although relatively innocuous in terms of its effects on international trade in general and Canada–US trade in particular (Hart, 2002), Fordney–McCumber did act as an ominous warning of things to come: namely the all-too-easy willingness on the part of the United States to sacrifice foreign access to the domestic market in the face of slack business conditions at home.

Deteriorating conditions in world agricultural markets were also to have a more direct impact on the Canadian economy during this period. Canada's privileged geographic position and imperial ties had allowed for unrivaled access for its agricultural goods in European markets during World War I. However, the share of agriculture in Canadian exports was in secular decline from 1919. In terms of its wider external relations, the Canadian economy was also heavily reliant on a handful of markets and a handful of goods. Even in the face of efforts to promote trade diversification, at no time were more than 33% of all exports shipped to destinations other than the United Kingdom or the United States (Hart, 2002). Of course, anything which threatened demand from either nation, whether it be deteriorating incomes or protectionist commercial policy, could potentially have serious implications for Canada.

The combination of these forces was already being signaled in Canadian trade statistics from the middle of the decade. Fig. 1a and b, respectively, depict real quarterly exports and imports for the period from January 1925 to December 1939. In 1925, exports clearly outstripped imports. However, comparing the evolution of the two series, it is clear that whereas exports had effectively plateaued imports continued to climb throughout the late 1920s. In combination, this was to have strong implications for the Canadian trade balance as depicted in Fig. 1c. From an excess of exports over imports of 3.292 billion 1990 USD in 1925 (or 7.94% of GDP in that year), the balance of trade had declined to 1.083 billion 1990 USD in 1928 (or 2.07% of GDP in that year). This necessarily represented a significant drag in the years leading up to 1929.

1929, of course, was to inaugurate a series of even more unfortunate developments for the Canadian macroeconomy. The simultaneous peak in the economic activity of the United States as well as drafting of the Smoot–Hawley tariff bill in the summer of 1929 constituted a serious threat to the two sources of Canadian success in external—and particularly American—markets: buoyant incomes and open commercial access. Little wonder then that the second and third quarter of 1929 represented the absolute peaks for the 12-month moving averages of Canadian exports and imports, respectively.

However, any glimmer of hope which remained for Canada steadily diminished throughout the remainder of 1929 and the beginning of 1930 as the session and accompanying log-rolling process surrounding Smoot–Hawley was taken to unprecedented lengths

(Taussig, 1930a). As Kindleberger (1989, p. 170) writes, “Democrats joined Republicans in their support for tariffs for all who sought them; and both Republicans and Democrats were ultimately pushed from the committee room as lobbyists took over the

task of setting the rates.” The aim of the legislation was remarkably clear in its focus as well as remarkably myopic to its likely consequences: in response to official Canadian protest and not-so-veiled threats of retaliation, the House Ways and Means Committee replied that “they were not so concerned with American exports, but only with the prevention of imports” (quoted in Kottman, 1975, pp. 615–616). As time progressed, much of the force of Smoot–Hawley—in combination with rapidly declining commodity prices (Crucini, 1994)—was to clearly fall on Canada, given its overwhelming reliance upon the US export market and the heavy-handed treatment to which the border trade in agricultural goods was subjected (Irwin, 2011; Taussig, 1930b). Thus, for Canada, Smoot–Hawley played a deciding role in not only short-run electoral politics as described below but also brought about a change in its commercial policy objectives from maintaining access to US goods and markets to finding a substitute for the US altogether (Conybeare, 1985; Kottman, 1975).

The Canadian response to Smoot–Hawley was more than just immediate: in anticipation of the bill’s final passage in June 1930, Prime Minister Mackenzie King announced changes to the Canadian tariff schedule a full month beforehand. While this response was swift, it lacked conviction and reflected a peculiar strategy of increased imperial discrimination in the face of increased American protectionism. Such moderation on the part of the Liberals, however, was not rewarded in the so-called “Canada First” election of late July 1930 (“The Imperial Economic Conference”, 1934). King’s chief adversary in this election was Richard B. Bennett. From the very beginning, addressing the affront of Smoot–Hawley and identifying the appropriate response were the key issues of the campaign. Bennett, in particular, was very clear about his intentions: “he pledged [not only] a future in which Canadians would no longer be ‘hewers of wood and drawers of water’” but also one in which higher tariffs would be used “to blast a way into markets that have been closed” (Rooth, 2010, p. 8). The message was well-received with the Conservatives securing a land-slide victory as Smoot–Hawley strongly antagonized wide sections of the Canadian electorate (McDonald et al., 1997).

The election of Bennett produced two outcomes with respect to Canadian commercial policy. Given the clear mandate in favor of protectionism, the administration proceeded to supplement the tariffs of May 1930 in the following September. An upper-bound estimate of the effects of these new tariffs suggests that

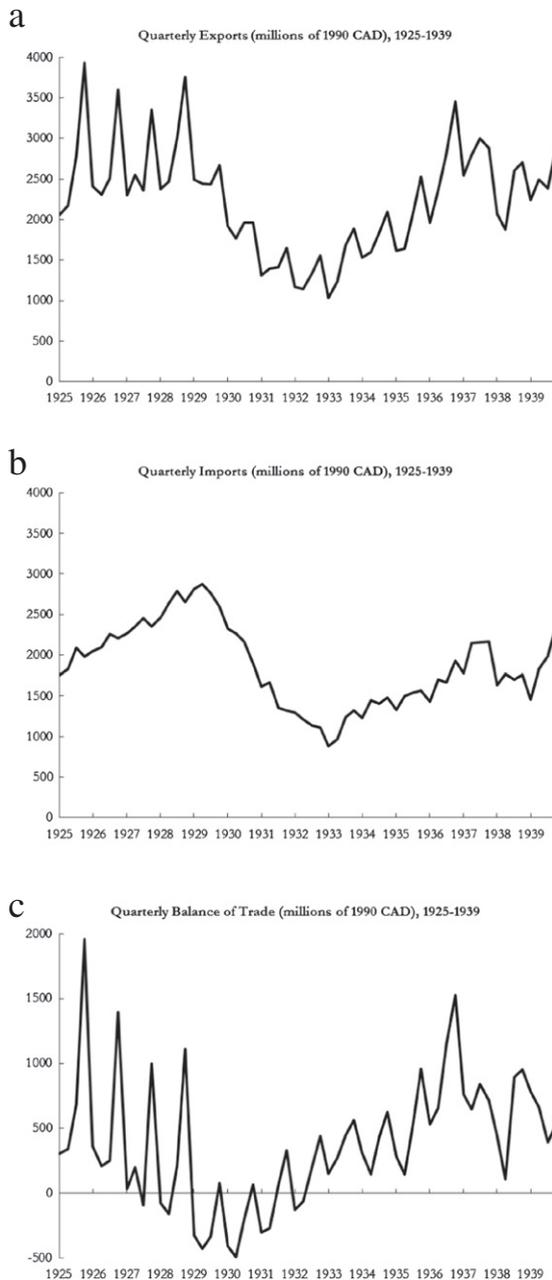


Fig. 1. a: Canadian real exports. b: Canadian real imports. c: Canadian balance of trade.

they potentially reduced US exports to Canada by 21% (Irwin, 2011). These changes were also significant in that by upwardly revising tariffs across the board they almost fully reversed the preferences for British goods embodied in the tariff legislation of May (MacKay, 1932). Clearly, protectionism against all and not discrimination against the United States was to be the new order of the day. Further measures were forthcoming in June 1931 which saw rises in Empire, general, and intermediate rates as well as the imposition of higher anti-dumping rates (Kindleberger, 1989).

Bennett also made good on his promise to call yet another Imperial Economic Conference in order to more fully decouple the Canadian economy from that of the United States. The conference of 1930 had yielded little in the way of substantive results. Much of this reflected the tension between the Dominions' desire to more fully penetrate the UK market through imperial preferences and the British government's long-suffering commitment to free trade. At the conference's conclusion, Bennett issued an invitation to reconvene the next year in Ottawa. Accordingly, expectations were not very high. Had the proposed conference proceeded as planned it is not obvious that the fundamental divergence of views in the Dominions and Westminster could have been reconciled (Drummond, 1972). However, the conference was delayed until 1932, a delay which witnessed not only the rise of the National coalition government in the UK in October 1931 but also the British abandonment of the gold standard and the cause of free trade (Capie, 1983; Rooth, 2010).

By the time that it was formally convened in July 1932, both Canadian and world trade in general were in free-fall as attested to by Figs. 1a and b. Canadian real exports and imports were down 48.6% and 61.2%, respectively, from July 1929. At the bilateral level, trade with the United States looked even worse: real exports to the US were down 67.3% while real imports were down by 65.4%. Bilateral trade with the United Kingdom represented a more moderate case with equivalent figures for exports and imports being a "mere" 48.3% and 13.4%. When matched against the cumulative declines in GDP from 1929 to 1932, these declines in exports and imports were severe: GDP declined 24.1% in Canada, 5.1% in the United Kingdom, 27.0% in the United States, and perhaps 10.4% globally (Maddison, 2004). Conclusively locating the sources of this trade bust has remained elusive (cf. Estevadeordal et al., 2003; Madsen, 2001). But clearly, this suggests a strong role for rising trade costs

(Jacks et al., 2011; Hynes et al., 2011), especially in light of the heightened protectionism detailed above.

Dominion success at Ottawa was critical in light of the passage of the UK's Import Duties Act of February 1932 (Glickman, 1947). This allowed for a direct duty of 10% ad-valorem which was to be levied on a very broad range of goods imported from non-Empire sources and which was subject to increase by a newly-formed Tariff Advisory Commission. Effective November 15, 1932, trade with the non-dependent Empire would also be subject to this legislation in the case that no new agreements were reached in Ottawa (Drummond, 1972). Standing in the way of this success was the intransigency of Australia and Canada in securing preferential access to the UK market for beef and wheat, their respective main exports, through higher tariffs (Pomfret, 2000). Lining up against these interests, the British negotiators pushed for their preference to lower barriers within the Empire rather than raise barriers outside of it.

Relenting somewhat on this point, the UK managed to negotiate 7 agreements on a strictly bilateral basis with Australia, Canada, India, Newfoundland, New Zealand, South Africa, and Southern Rhodesia as well as grant substantial tariff concessions to a number of non-self-governing colonies (Lattimer, 1934). In addition, Canada managed to negotiate or re-negotiate 5 agreements with Australia, the Irish Free State, New Zealand, South Africa, and Southern Rhodesia while further agreements with India and Newfoundland were concluded very shortly thereafter (Hart, 2002). The principal outcomes from the perspective of the UK were that it guaranteed continued application of the Import Duties Act on non-imperial goods while the Empire was granted continued exemption, the UK would impose new or revised tariffs on a wide range of agricultural products, the UK would apply significant quantitative restrictions on the import of animal products from foreign countries, that signatories were granted MFN status in any future negotiations with non-Imperial parties, and that all the aforementioned concessions would continue for five years but were subject to change at the discretion of the signatories given a mere six months' notice (Glickman, 1947).

In return for this lengthy list of concessions, the Dominions ceded considerably less ground. Canada, in particular, made vague promises about abolishing its surcharge on British imports and its imposition of arbitrary customs valuations, both of which were imposed following the UK's abandonment of the gold standard (Eichengreen and Irwin, 2010). More substantively, it pledged no changes for those goods

already enjoying preferential treatment and an improvement in the terms of preference for over 200 British goods. Compared to the relatively scant 900 line-items in its tariff code, this easily represented the most important concession to the UK. Canada affected similar changes—or at least, maintenance—of rates of preferential treatment in its agreements with the rest of the British Empire.

With such potentially far-reaching changes in commercial policy, especially with respect to the UK market, the cause of Imperial trade seemed poised for a turn for the better. Indeed, even a very casual glance at Fig. 1a and b reveals a significant reversal in Canadian trade volumes almost immediately following the enactment of the provisions of the Ottawa Conference in November 15, 1932. Thus, a very historically uninformed opinion might ascribe a primary role for the Ottawa Conference in reviving the fortunes of Canadian trade in this period. Of course, a number of conflating factors arose in the meantime such as the global recovery in GDP from the first quarter of 1933 and the perhaps-related abandonment of the gold standard by the US in the same period. So, a few questions remain. Did the Imperial Economic Conference actually serve to boost the growth of imperial trade over and beyond that of non-imperial nations? If not, what were the sources of its failure? The following sections seek to directly address these questions with a consideration of the data used being the first point of order.

3. Data

The primary source used in this study is the *Dominion Bureau of Statistics' Monthly Report of the Trade of Canada* from January 1925 to December 1927 and *Quarterly Report of the Trade of Canada* from January 1928 to December 1939. The coverage of the bilateral trade data is uniquely wide across the commodity and country spectrum for this era. The dataset encompasses nine broad commodity classifications: Agricultural and Vegetable Products; Animals and Animal Products; Fibers, Textiles, and Textile Products; Wood, Wood Products, and Paper; Iron and Its Products; Non-Ferrous Metals and Their Products; Non-Metallic Minerals and Their Products; Chemicals and Allied Products; and Miscellaneous Commodities.² Figures for total bilateral

exports and imports are separately reported which correspond with the sum across the nine commodity classifications. The dataset also spans the near universe of possible trading partners for Canada and consistently records those observations on bilateral trade which equal zero. Lacking monthly or quarterly data on export and import prices disaggregated across commodities, all bilateral trade data have been deflated by the Statistics Canada monthly wholesale consumer price index and then summed up across quarters.

To gain a broader perspective on the composition of Canadian trade and its changes over time, Fig. 2a and b consider Canadian export and import shares by region on a quarterly basis from 1925 to 1939. In Fig. 2a, the clearest pattern for Canadian exports is the jockeying of position between the United Kingdom and the United States. A slight lead on the part of the United Kingdom in 1925 is whittled away until 1930 when the share of the United States crests. Another reversal in the United Kingdom's favor occurs in 1932 which, in turn, is reversed in 1936. As to other regions, there is a clear decline in the rest of the world's share dating from 1929 and a clear—but perhaps less visible—increase in the share of the rest of the British Empire from 1933. In Fig. 2b, the dominance of the United States as a source of Canadian imports is without question as its share stood on average 3.5 times greater than that of the United Kingdom, its closest competitor. At the same time, it demonstrates a fair degree of variation as the series for the United Kingdom and the United States reach their respective trough and peak in 1929 and their respective peak and trough in 1933. Indeed, the symmetry between the two is nothing short of remarkable. As to other regions, a similar pattern as for exports emerges again: a steadily increasing and much more visible rise for the rest of the British Empire and a decline in the rest of the world's share from 1933. Underlying all of these series is a decided lack of discontinuity in 1932, suggesting that the effects of the Ottawa conference on Canadian trade were muted.³

4. Empirical strategy

Again, the primary question motivating this study is the following: did the Ottawa Conference actually serve to boost the growth of imperial trade over and beyond

² Appendix 1 details the principal goods contained in each commodity classification while Appendix 2 details the principal destinations and origins of Canadian exports and imports by each commodity classification.

³ The working paper version of this article (Jacks, 2011) considers the long-run patterns in the commodity shares, intra-industry trade, and the extensive margin of Canadian trade, again finding no discernible breaks in or around 1932 in these series.

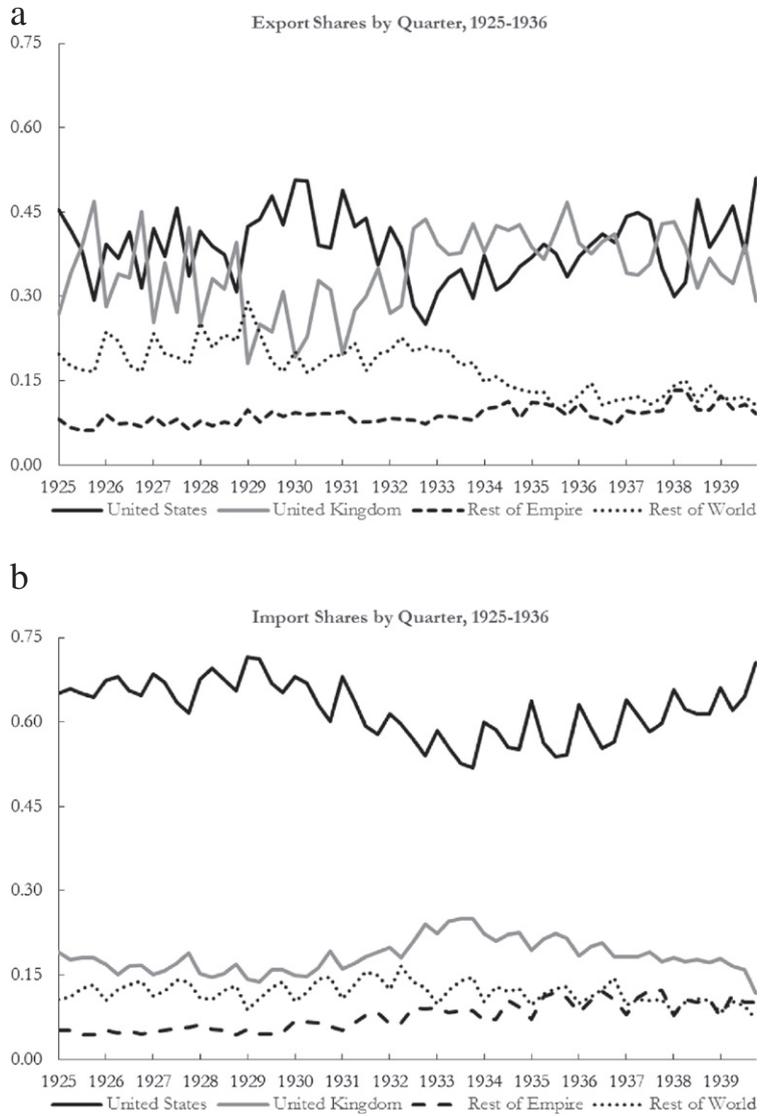


Fig. 2. a: Canadian export shares by region. b: Canadian import shares by region.

that of non-imperial nations? In this regard, the most straightforward way to proceed is to note that bilateral trade flows are nearly always described by an equation like the following (Jacks et al., 2011):

$$x_{ijt} = G_t M_i^{ex} M_j^{im} \phi_{ijt}. \tag{1}$$

The first term represents exports from country i to country j at time t while the second term is a common time-specific factor determining trade. The third and fourth terms are indices of the attributes of exporter i

and importer j , respectively, which are potentially time-varying. The final term represents factors which directly affect bilateral trade intensity. Thus, bilateral trade is a function of factors common to all countries, factors within particular countries such as size and productivity, and factors specific to country-pairs. It is these last country-pair specific factors which will be of particular interest as they are thought to capture the bilateral trade costs facing countries. Trade costs are all the costs of transaction and transport associated with the exchange of goods across national borders. Broadly, they

include obvious barriers such as tariffs and transport costs but also many others that are more difficult to observe such as the costs of overcoming language barriers and exchange rate risk. Here, we wish to determine the degree to which the Ottawa Conference served to lower bilateral trade costs between its signatories and thereby raise bilateral trade flows in the same over and beyond that of non-signatories.

As a first step, an appropriate identification strategy is to make use of a simple difference-in-differences specification,⁴ such that year-on-year observations on bilateral trade in two quarters are pooled:

$$\ln(x_{ijt}) = \beta_i + \beta_j + \beta_1 * T + \beta_2 * T * Ottawa_{ij} + \varepsilon_{ijt}. \quad (2)$$

T is an indicator for the post-Ottawa Conference period which is common to all country-pairs and $Ottawa$ is an indicator for whether a particular Canadian trading partner was a signatory at the Ottawa Conference.⁵ Note that this specification necessarily assumes that any annual changes in other bilateral trade cost elements (e.g., maritime freight rates) are uncorrelated with $Ottawa$. Likewise, it assumes there is no change in the attributes of exporter i and importer j . The latter is the stronger of the two, and in later sections, we address this issue head-on by exploring a much more exacting specification.

Another issue which arises is the appropriate means for estimating gravity equations such as (2). It has long been noticed that this particular specification presents a problem in the presence of bilateral trade observations which are zero. The most common solutions have been either to employ a Tobit estimator or transform the dependent variable into $\ln(1 + x_{ijt})$ and run OLS (otherwise known as scaled OLS). Recently, Santos Silva and Tenreyro (2006) have argued that in the presence of heteroskedasticity such estimators are biased and inconsistent. Instead, they argue for estimating (2) in its multiplicative form by use of a Poisson pseudo-maximum-likelihood (PPML) estimator. They demonstrate that in simulations the PPML estimator performs markedly better than either the scaled OLS or Tobit estimator as well as argue that their estimation technique does a superior job of

handling zero observations. These claims have also been corroborated for data from the interwar period (Ritschl and Wolf, 2011) and for the evaluation of preferential trade agreements in the present day (Egger et al., 2011). Cumulatively, this suggests that the use of the PPML estimator on bilateral trade levels—as opposed to logs—is the most appropriate way forward.⁶

Finally, this paper fully exploits the multiple dimensions of the dataset by distinguishing between Canadian bilateral exports and imports, by exploring systematic differences across commodity classifications and aggregates, and by considering year-on-year changes in trade volumes for given quarters corresponding to the announcement of the Ottawa Conference's results on August 15, 1932 (Q3 1932) and the enactment of its provisions on November 15, 1932 (Q4 1932). The rationale for using different starting points is that firms, in anticipation of the enactment of its provisions, may have entered new markets in the period from August 15, 1932, in an attempt to gain market share in the future.

5. Results

5.1. Baseline results

Tables 1a and 1b report the coefficients for T (an indicator for the post-Ottawa Conference period) and its interaction with $Ottawa$ (an indicator for whether a particular Canadian trading partner was a signatory at the Ottawa Conference). In this framework, the coefficient on T is interpreted as the growth rate shared in common by all countries. The coefficient on $T * Ottawa$ is then the differential growth in Canadian bilateral trade with signatories of the Ottawa Conference which is observed at the end of the period.

Thus, the cell in the upper-left hand corner of Table 1a reports the results of estimating Eq. (2) for Canadian exports of Agricultural and Vegetable Products, pooling the observations for the third quarters of 1932 and 1933 and representing Canadian export trade with 118 countries from the announcement of results on August 15, 1932. Likewise, the cell in the lower-right hand corner of Table 1a reports the results of estimating Eq. (2) for total Canadian exports, pooling the observations for the fourth quarters of 1932 and 1933 and representing Canadian

⁴ Although more generally associated with the applied micro literature, the use of difference-in-differences gravity specifications is not unprecedented (Baldwin and Harrigan, 2011; Hanson and Xiang, 2004).

⁵ Thus, Australia, India, the Irish Free State, New Zealand, Newfoundland, South Africa, Southern Rhodesia, and the United Kingdom would be assigned a value of one for $Ottawa$.

⁶ It should also be noted that this approach abstracts away from the problem of giving equal observational weight to large and small countries alike as is the case in the log–log specification.

export trade with 118 countries from the enactment of provisions on November 15, 1932. In the latter case, the respective coefficient values of 0.1864 and 0.0105 for T

and $T * Ottawa$ suggest that in the fourth quarter of 1933 Canadian exports to all other countries of the world grew on average by 20.5% from the fourth quarter of 1932

Table 1a
Canadian exports in response to Ottawa.

	(1)	(2)	(3)	(4)
	Dependent variable: Canadian exports			
	From announcement of results, Q3 1932		From enactment of provisions, Q4 1932	
	Time fixed effect	Ottawa-time interaction	Time fixed effect	Ottawa-time interaction
Agricultural and vegetable products, one year out	0.1350	-0.2040	-0.0014	-0.0164
Standard error	0.1900	0.1900	0.2300	0.2300
p-Value	0.4700	0.2800	0.9900	0.9400
	n = 236		n = 236	
Animals and animal products, one year out	0.3383	-0.1928	0.2919	0.2604
Standard error	0.0600	0.0600	0.0500	0.0600
p-Value	0.0000	0.0000	0.0000	0.0000
	n = 236		n = 236	
Chemicals and allied products, one year out	0.5211	-0.4305	0.1796	-0.0305
Standard error	0.1200	0.1400	0.0500	0.0700
p-Value	0.0000	0.0000	0.0000	0.6600
	n = 236		n = 236	
Fibers, textiles and products, one year out	1.2556	-0.9473	0.9610	-0.4586
Standard error	0.2500	0.2800	0.4000	0.4200
p-Value	0.0000	0.0000	0.0200	0.2700
	n = 236		n = 236	
Iron and its products, one year out	0.1558	0.1200	0.3286	0.0475
Standard error	0.3200	0.4600	0.3200	0.4100
p-Value	0.6300	0.7900	0.3100	0.9100
	n = 236		n = 236	
Miscellaneous commodities, one year out	0.1920	-0.2725	0.4222	-0.9292
Standard error	0.0600	0.0700	0.0400	0.2100
p-Value	0.0000	0.0000	0.0000	0.0000
	n = 236		n = 236	
Non-ferrous metal products, one year out	0.6341	0.2131	0.5961	0.0803
Standard error	0.1200	0.1800	0.1600	0.1600
p-Value	0.0000	0.2500	0.0000	0.6300
	n = 236		n = 236	
Non-metallic mineral products, one year out	0.5961	-0.0543	0.7765	-0.7087
Standard error	0.0600	0.1600	0.1500	0.1800
p-Value	0.0000	0.7400	0.0000	0.0000
	n = 236		n = 236	
Paper and wood, one year out	0.2988	-0.0555	0.1091	0.4584
Standard error	0.0200	0.0800	0.0400	0.0800
p-Value	0.0000	0.4800	0.0100	0.0000
	n = 236		n = 236	
Total merchandise exports, one year out	0.3095	-0.1751	0.1864	0.0105
Standard error	0.0900	0.0900	0.1000	0.1100
p-Value	0.0000	0.0600	0.0700	0.9200
	n = 236		n = 236	

Notes: Results in column (1) are generated from a single regression pooling exports from Q3 1932 and Q3 1933. Results in column (2) are generated from a single regression pooling exports from Q4 1932 and Q4 1933. Results in column (3) are generated from a single regression pooling imports from Q3 1932 and Q3 1933. Results in column (4) are generated from a single regression pooling imports from Q4 1932 and Q4 1933. Poisson pseudo-maximum-likelihood (PPML) used for all regressions. Exporter and importer fixed effects have been suppressed while standard errors are clustered on countries. Australia, India, the Irish Free State, New Zealand, Newfoundland, South Africa, Southern Rhodesia, and the United Kingdom (along with Canada) were signatories at Ottawa.

Sources: Bilateral trade data drawn from Bureau of the Census, *Monthly Summary of Foreign Commerce of the United States*, various years and DBS, *Quarterly Report of the Trade of Canada*, various years.

Table 1b
Canadian imports in response to ottawa.

	(1)	(2)	(3)	(4)
Dependent variable: Canadian imports				
	From announcement of results, Q3 1932		From enactment of provisions, Q4 1932	
	Time fixed effect	Ottawa-time interaction	Time fixed effect	Ottawa-time interaction
Agricultural and vegetable products, one year out	0.1190	-0.0877	0.1854	-0.1664
Standard error	0.0700	0.2400	0.0600	0.1000
p-Value	0.0800	0.7100	0.0000	0.0800
	n = 236		n = 236	
Animals and animal products, one year out	0.2229	0.5564	0.2194	0.1560
Standard error	0.1100	0.2000	0.1200	0.2600
p-Value	0.0300	0.0100	0.0600	0.5500
	n = 236		n = 236	
Chemicals and allied products, one year out	-0.0172	0.5115	0.0276	0.0377
Standard error	0.0500	0.0500	0.1000	0.1000
p-Value	0.7500	0.0000	0.7700	0.7000
	n = 236		n = 236	
Fibers, textiles and products, one year out	0.2338	0.2060	0.3096	0.1038
Standard error	0.0500	0.0700	0.0400	0.0500
p-Value	0.0000	0.0000	0.0000	0.0400
	n = 236		n = 236	
Iron and its products, one year out	0.1527	0.3661	0.1904	0.2050
Standard error	0.0200	0.0300	0.0100	0.0200
p-Value	0.0000	0.0000	0.0000	0.0000
	n = 236		n = 236	
Miscellaneous commodities, one year out	-0.1827	0.1599	-0.0127	0.0198
Standard error	0.0300	0.0300	0.0300	0.0500
p-Value	0.0000	0.0000	0.7000	0.6900
	n = 236		n = 236	
Non-ferrous metal products, one year out	0.1917	-0.2851	0.3789	-0.6783
Standard error	0.1500	0.1500	0.0800	0.0800
p-value	0.2000	0.0600	0.0000	0.0000
	n = 236		n = 236	
Non-metallic mineral products, one year out	-0.1265	0.0350	0.1092	0.0774
Standard error	0.0400	0.0400	0.0500	0.0500
p-Value	0.0000	0.3400	0.0300	0.1200
	n = 236		n = 236	
Paper and wood, one year out	-0.0210	0.0370	0.0417	-0.0279
Standard error	0.0200	0.0200	0.0100	0.0300
p-Value	0.2400	0.0500	0.0000	0.3300
	n = 236		n = 236	
Total merchandise imports, one year out	0.0324	0.2058	0.1605	0.0312
Standard error	0.0300	0.0600	0.0300	0.0500
p-Value	0.2000	0.0000	0.0000	0.4900
	n = 236		n = 236	

Notes: Each pair of coefficients in columns (1) and (2) are generated from a single regression pooling imports from Q3 1932 and Q3 1933. Each pair of coefficients in columns (3) and (4) are generated from a single regression pooling imports from Q4 1932 and Q4 1933. Poisson pseudo-maximum-likelihood (PPML) used for all regressions. Exporter and importer fixed effects have been suppressed while standard errors are clustered on countries. Australia, India, the Irish Free State, New Zealand, Newfoundland, South Africa, Southern Rhodesia, and the United Kingdom (along with Canada) were signatories at Ottawa. Sources: Bilateral trade data drawn from DBS, *Quarterly Report of the Trade of Canada*, various years.

while Canadian exports to signatories at Ottawa grew on average by 21.8% for the same period.⁷ However, while

⁷ The formula to compute the former effect is $(e^{\beta_1} - 1) * 100\%$ while the formula to compute the latter effect is $(e^{\beta_1 + \beta_2} - 1) * 100\%$.

the indicator variable for T is statistically significant, the interacted term proves to be statistically insignificant.

A few conclusions from Table 1a are clearly forthcoming. First, the data demonstrates a wide range of potential effects arising from the Ottawa

conference across commodities. For instance, the Miscellaneous Commodities category registers a 7.7% decline in Canadian exports to signatories in the period from the third quarter of 1932 while the Fibers, Textiles and Products category registers a 36.1% increase in the same period. Large differences such as these arise for both periods, presumably reflecting the differential size and impact of the concessions agreed to at Ottawa. Second, even for all this heterogeneity across commodities, the results for each product category tell a consistent story when considered as a whole. Thus, the negative coefficients on the interaction between *T* and *Ottawa* in the second column for Animals and Animal Products, Chemicals and Allied Products, Fibers, Textiles and Products, and Miscellaneous Commodities, are consistent with the large and statistically significant coefficient estimated for Total Merchandise Exports from Q3 1932 to Q3 1933. Finally and most importantly, the results for total exports suggest that a potential—and negative—differential growth effect for the announcement of the Ottawa conference (−16.1% in between Q3 1932 and 1933) quickly petered out for the period between Q4 1932 and 1933 when the differential growth effect stood at a meager (and statistically insignificant) +1.1%.

With respect to Canadian imports, *Table 1b* corroborates the results above. Estimates of the *T * Ottawa* interaction widely vary across commodities, but tell a consistent story within periods. Furthermore, they point to the steady decline in any potential differential growth effect of the Ottawa conference from the announcement of its results (+22.9%) and to the enactment of its provisions (+3.2%). Cumulatively, these results suggests that the Ottawa Conference was somewhat of a failure in that the cause of Canadian trade with the rest of the Empire seems to have been furthered little in its wake. Identifying the sources of this failure as well as placing the results in a broader context is the objects of the final sections. In what immediately follows, the results presented in *Tables 1a and 1b* are subjected to a number of robustness exercises.

5.2. Incorporating different time horizons

A potential objection concerning the preferred specification is that it only incorporates changes in bilateral trade flows for one particular interval length, namely one year, from the beginning of the policy innovation. Lacking any formal model or historical precedent, the choice of a 4-quarter lag may seem

arbitrary. To this end, the relevant comparison over time was extended to include changes over 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12 quarters. The results for exports and imports are reported in *Table 2a and 2b*, respectively. *Table 2a* demonstrates a high degree of correspondence with *Table 1a*: indeed, the only statistically significant results in the second and fourth columns would suggest a negative effect of the Ottawa conference on Canadian exports to the other signatories. As to *Table 2b*, the results are decidedly more mixed. Again, the strong, positive effect of the conference on Canadian imports from its signatories dating from the announcement of its results emerges. However, the clearest divergence between *Tables 1b and 2b* arises in the fourth column in which the positive, but statistically insignificant effect on Canadian imports dating from the enactment of the conference's provisions turns decidedly negative and statistically significant at all intervals greater than six quarters out (i.e. after Q2 1934). If anything, these results cast further doubt on the efficacy of the Ottawa Conference in promoting intra-imperial trade.

5.3. Incorporating the Greater British Empire

Naturally, the working definition of Empire used throughout has been a fairly narrow one: it includes only the signatories of bilateral trade agreements with Canada at or around the time of the Ottawa Conference, a fairly slim seven dominions and non-dependent colonies plus the United Kingdom. Perhaps a broader and more historically accurate definition of the British Empire would change the results. This could be so for a number of reasons. First, the Ottawa Conference entailed numerous provisions which affected the dependent colonies of the British Empire. At the same time, it almost certainly heightened awareness of an ongoing “Buy Empire” marketing campaign (Rooth, 1993). Broadening the definition of the British Empire used increases the number of countries under consideration from 8 to 35, or roughly one-third of the sample. The results of this exercise are reported in *Table 3*. Again, the patterns initially established in *Tables 1a and 1b* hold: a potentially strong differential effect for both exports and imports from the announcement of its provisions (−15.3% and +17.7%, respectively) gives way to quantitatively small as well statistically insignificant effects from the enactment of its provisions (−0.1% and +2.6%, respectively).

5.4. Incorporating different price indices

As mentioned previously, all bilateral trade data have been deflated by the Statistics Canada monthly wholesale consumer price index. Although unlikely given the amount of variation in the nominal bilateral trade series themselves, the common trend in this price index could potentially impart a bias to the estimates.

Table 2a
Canadian exports in response to Ottawa, incorporating different time horizons.

	(1)	(2)	(3)	(4)
Dependent variable: Canadian exports				
	From announcement of results, Q3 1932		From enactment of provisions, Q4 1932	
	Time fixed effect	Ottawa-time interaction	Time fixed effect	Ottawa-time interaction
1 Quarter out	0.1362	0.0336	-0.3382	-0.1577
Standard error	0.0830	0.0856	0.0989	0.1035
p-Value	0.1010	0.6940	0.0010	0.1280
2 Quarters out	-0.2020	-0.1241	-0.1346	-0.2084
Standard error	0.0984	0.0994	0.1165	0.1248
p-Value	0.0400	0.2120	0.2480	0.0950
3 Quarters out	0.0016	-0.1747	0.1732	-0.2088
Standard error	0.0701	0.0747	0.1376	0.1424
p-Value	0.9820	0.0190	0.2080	0.1430
4 Quarters out	0.3095	-0.1751	0.1864	0.0105
Standard error	0.0894	0.0915	0.1041	0.1076
p-Value	0.0010	0.0560	0.0730	0.9220
5 Quarters out	0.3226	0.0441	0.0446	-0.1237
Standard error	0.0564	0.0574	0.2121	0.2267
p-Value	0.0000	0.4420	0.8340	0.5850
6 Quarters out	0.1808	-0.0900	-0.0079	0.0681
Standard error	0.1638	0.1744	0.1565	0.1686
p-Value	0.2700	0.6060	0.9600	0.6860
7 Quarters out	0.1283	0.1017	0.1314	0.0731
Standard error	0.1031	0.1118	0.1898	0.2089
p-Value	0.2130	0.3630	0.4890	0.7270
8 Quarters out	0.2676	0.1067	0.2878	0.0280
Standard error	0.1404	0.1558	0.2276	0.2314
p-Value	0.0570	0.4940	0.2060	0.9040
9 Quarters out	0.4241	0.0616	0.0647	-0.0594
Standard error	0.1803	0.1819	0.2340	0.2531
p-Value	0.0190	0.7350	0.7820	0.8150
10 Quarters out	0.2009	-0.0257	0.1253	-0.1522
Standard error	0.1884	0.2035	0.2434	0.2628
p-Value	0.2860	0.8990	0.6070	0.5630
11 Quarters out	0.2615	-0.1185	0.2532	0.0591
Standard error	0.1937	0.2094	0.2854	0.2968
p-Value	0.1770	0.5710	0.3750	0.8420
12 Quarters out	0.3894	0.0927	0.3836	0.2022
Standard error	0.2325	0.2408	0.2514	0.2555
p-Value	0.0940	0.7000	0.1270	0.4290
	n = 1534		n = 1534	

Table 2b
Canadian imports in response to Ottawa, incorporating different time horizons.

	(1)	(2)	(3)	(4)
Dependent variable: Canadian imports				
	From announcement of results, Q3 1932		From enactment of provisions, Q4 1932	
	Time fixed effect	Ottawa-time interaction	Time fixed effect	Ottawa-time interaction
1 quarter out	-0.0794	0.2269	-0.1775	-0.1533
Standard error	0.0219	0.0519	0.0352	0.0580
p-Value	0.0000	0.0000	0.0000	0.0080
2 quarters out	-0.2569	0.0737	-0.1054	-0.1376
standard error	0.0450	0.0793	0.0271	0.1320
p-Value	0.0000	0.3530	0.0000	0.2970
3 quarters out	-0.1848	0.0894	0.1118	-0.0212
Standard error	0.0211	0.1117	0.0318	0.0658
p-Value	0.0000	0.4240	0.0000	0.7470
4 quarters out	0.0324	0.2058	0.1605	0.0312
standard error	0.0255	0.0636	0.0289	0.0455
p-Value	0.2040	0.0010	0.0000	0.4940
5 quarters out	0.0811	0.2581	0.1395	-0.1543
standard error	0.0294	0.0431	0.0566	0.1069
p-Value	0.0060	0.0000	0.0140	0.1490
6 quarters out	0.0601	0.0727	0.3311	-0.2495
Standard error	0.0639	0.1082	0.0270	0.0914
p-Value	0.3470	0.5020	0.0000	0.0060
7 quarters out	0.2517	-0.0226	0.2796	-0.1561
Standard error	0.0316	0.0864	0.0346	0.0729
p-Value	0.0000	0.7940	0.0000	0.0320
8 quarters out	0.2002	0.0708	0.3267	-0.1573
Standard error	0.0276	0.0460	0.0255	0.0627
p-Value	0.0000	0.1240	0.0000	0.0120
9 quarters out	0.2474	0.0697	0.2718	-0.3624
Standard error	0.0263	0.0579	0.0636	0.0954
p-Value	0.0000	0.2290	0.0000	0.0000
10 quarters out	0.1924	-0.1355	0.3494	-0.1929
Standard error	0.0706	0.0968	0.0306	0.0558
p-Value	0.0060	0.1620	0.0000	0.0010
11 quarters out	0.2700	0.0340	0.3590	-0.1158
Standard error	0.0299	0.0560	0.0381	0.0601
p-Value	0.0000	0.5440	0.0000	0.0540
12 quarters out	0.2796	0.1111	0.3978	-0.1990
Standard error	0.0309	0.0469	0.0491	0.0731
p-Value	0.0000	0.0180	0.0000	0.0060
	n = 1534		n = 1534	

Notes: Results in columns (1) and (2) are generated from a single regression pooling imports from Q3 1932 and all subsequent quarters up to Q3 1935. Results in columns (3) and (4) are generated from a single regression pooling imports from Q4 1932 and all subsequent quarters up to Q4 1935. Poisson pseudo-maximum-likelihood (PPML) used for all regressions. Exporter and importer fixed effects have been suppressed while standard errors are clustered on countries. Australia, India, the Irish Free State, New Zealand, Newfoundland, South Africa, Southern Rhodesia, and the United Kingdom (along with Canada) were signatories at Ottawa.

Sources: Bilateral trade data drawn from DBS, Quarterly Report of the Trade of Canada, various years.

Table 3
Canadian trade in response to Ottawa, incorporating the greater British empire.

(1)	(2)	(3)	(4)
Dependent variable: Canadian exports			
From announcement of results, Q3 1932		From enactment of provisions, Q4 1932	
Time fixed effect	Ottawa-time interaction	Time fixed effect	Ottawa-time interaction
0.3104	-0.1665	0.1923	-0.0016
0.0900	0.1000	0.1100	0.1100
0.0000	0.0900	0.0700	0.9900
n = 236		n = 236	
Dependent variable: Canadian imports			
From announcement of results, Q3 1932		From enactment of provisions, Q4 1932	
Time fixed effect	Ottawa-time interaction	Time fixed effect	Ottawa-time interaction
0.0366	0.1628	0.1613	0.0256
0.0300	0.0800	0.0300	0.0500
0.2000	0.0300	0.0000	
n = 236		n = 236	

Notes: Each pair of coefficients in columns (1) and (2) are generated from a single regression pooling trade data from Q3 1932 and Q3 1933. Each pair of coefficients in columns (3) and (4) are generated from a single regression pooling trade data from Q4 1932 and Q4 1933. Poisson pseudo-maximum-likelihood (PPML) used for all regressions. Exporter and importer fixed effects have been suppressed while standard errors are clustered on countries. Australia, India, the Irish Free State, New Zealand, Newfoundland, South Africa, Southern Rhodesia, and the United Kingdom (along with Canada) were signatories at Ottawa.

Sources: Bilateral trade data drawn from DBS, *Quarterly Report of the Trade of Canada*, various years.

The [Dominion Bureau of Statistics \(1949\)](#) reports annual price indices for exports and imports in aggregate and across eight commodity classifications (Agricultural and Vegetable Products and Animals and Animal Products are combined together in this instance) for the years from 1926 to 1939. Thus, in [Tables 4a and 4b](#) we substitute the annual, but disaggregate price indices for the monthly, but aggregate price index used in our preferred specification. Again, this exercise does not materially affect the results: apart from some minor and expected changes in the value of coefficients, the same patterns of sign and significance emerge.

5.5. Incorporating multilateral resistance

In recent years, one of the strongest conclusions to have emerged from the extensive literature on the

gravity equation is that precise inference relies upon a proper treatment of so-called multilateral resistance ([Anderson and van Wincoop, 2003](#)). The best way to think of this is as an unobserved average trade barrier effect which may potentially bias any estimates of the effects of changes in bilateral trade costs. That is, there may have been either countervailing or reinforcing changes in the bilateral trade costs separating other countries from one another which accompanied any potential reduction in Canadian bilateral trade costs attendant upon the Ottawa Conference, e.g., the rise in German quantitative restrictions on American goods in 1932.

With respect to the terms of Eq. (1), the solution is straightforward in that the exporter and importer effects are now time-varying:

$$x_{ijt} = G_t M_{it}^{ex} M_{jt}^{im} \phi_{ijt}. \quad (3)$$

With respect to the data at hand, however, this is problematic in that we only observe Canadian bilateral trade and, thus, every observation would exactly correspond with the time-varying exporter or importer fixed effects. One way forward is to combine the Canadian trade data with equivalent data from the US. Unfortunately, US sources only report total bilateral trade on a monthly basis; that is, there are no separate records of bilateral trade at the commodity level. The necessary data is drawn from the [Bureau of the Census's Monthly Summary of Foreign Commerce of the United States](#) and was first translated into Canadian dollars using the monthly bilateral exchange rate, then deflated using the Canadian monthly consumer price index, and finally aggregated to the quarterly level. These figures are then joined with the relevant Canadian trade data, allowing for 95 precise country matches.

In this case, we must augment the benchmark difference-in-differences specification to allow for any differential growth in Canadian versus US trade with signatories at the Ottawa conference. The resulting difference-in-difference-in-differences (DDD) specification pools observations on Canadian and US bilateral trade in two periods:

$$\begin{aligned} \ln(x_{ijt}) = & \beta_{it} + \beta_{jt} + \beta_1 * Ottawa_{ij} + \beta_2 * Canada_{ij} \\ & + \beta_3 * Ottawa_{ij} * Canada_{ij} + \beta_4 * T \\ & + \beta_5 * Ottawa_{ij} * T + \beta_6 * Canada_{ij} * T \\ & + \beta_7 * Ottawa_{ij} * Canada_{ij} * T + \varepsilon_{ijt}. \end{aligned}$$

Here, *Ottawa* is an indicator for whether a particular bilateral pair includes a signatory at the Ottawa

Conference, *Canada* is an indicator for whether a particular bilateral pair includes Canada, and *T* is an indicator for time which is common to all country-pairs. The coefficient of interest in this case will be the seventh

beta which indicates the degree to which Canada's bilateral trade with signatories at Ottawa changed at a differential rate than that of US bilateral trade with the same. Again, the PPML estimator is used throughout.

Table 4a
Canadian exports in response to Ottawa, incorporating different price indices.

	(1)	(2)	(3)	(4)
Dependent variable: Canadian exports				
	From announcement of results, Q3 1932		From enactment of provisions, Q4 1932	
	Time fixed effect	Ottawa-time interaction	Time fixed effect	Ottawa-time interaction
Agricultural and vegetable products, one year out	0.0298	-0.2059	-0.1011	-0.0164
Standard error	0.1900	0.1900	0.2300	0.2300
p-Value	0.8700	0.2800	0.6600	0.9400
	n = 236		n = 236	
Animals and animal products, one year out	0.2315	-0.1917	0.1922	0.2604
Standard error	0.0600	0.0600	0.0500	0.0600
p-Value	0.0000	0.0000	0.0000	0.0000
	n = 236		n = 236	
Chemicals and allied products, one year out	0.5223	-0.4334	0.1863	-0.0305
Standard error	0.1200	0.1400	0.0500	0.0700
p-Value	0.0000	0.0000	0.0000	0.6600
	n = 236		n = 236	
Fibers, textiles and products,	1.2140	-0.9468	0.9197	-0.4586
Standard error	0.2500	0.2800	0.4000	0.4200
p-Value	0.0000	0.0000	0.0200	0.2700
	n = 236		n = 236	
Iron and its products, one year out	0.1653	0.1218	0.3459	0.0475
Standard error	0.3200	0.4600	0.3200	0.4100
p-Value	0.6100	0.7900	0.2800	0.9100
	n = 236		n = 236	
Miscellaneous commodities, one year out	0.1941	-0.2743	0.4301	-0.9292
Standard error	0.0600	0.0700	0.0400	0.2100
p-Value	0.0000	0.0000	0.0000	0.0000
	n = 236		n = 236	
Non-ferrous metal products, one year out	0.5096	0.2103	0.4581	0.0803
Standard error	0.1200	0.1800	0.1600	0.1600
p-Value	0.0000	0.2500	0.0100	0.6300
	n = 236		n = 236	
Non-metallic mineral products, one year out	0.7225	-0.0585	0.9085	-0.7087
Standard error	0.0600	0.1600	0.1500	0.1800
p-Value	0.0000	0.7200	0.0000	0.0000
	n = 236		n = 236	
Paper and wood, one year out	0.4361	-0.0553	0.2525	0.4584
Standard error	0.0200	0.0800	0.0400	0.0800
p-Value	0.0000	0.4800	0.0000	0.0000
	n = 236		n = 236	
Total merchandise exports, one year out	0.2913	-0.1762	0.1742	0.0105
Standard error	0.0900	0.0900	0.1000	0.1100
p-Value	0.0000	0.0500	0.0900	0.9200
	n = 236		n = 236	

Notes: Each pair of coefficients in columns (1) and (2) are generated from a single regression pooling exports from Q3 1932 and Q3 1933. Each pair of coefficients in columns (3) and (4) are generated from a single regression pooling exports from Q4 1932 and Q4 1933. Poisson pseudo-maximum-likelihood (PPML) used for all regressions. Exporter and importer fixed effects have been suppressed while standard errors are clustered on countries. Australia, India, the Irish Free State, New Zealand, Newfoundland, South Africa, Southern Rhodesia, and the United Kingdom (along with Canada) were signatories at Ottawa. Sources: Bilateral trade data drawn from DBS, *Quarterly Report of the Trade of Canada*, various years.

Table 4b
Canadian imports in response to Ottawa, incorporating different price indices.

	(1)	(2)	(3)	(4)
	Dependent variable: Canadian imports			
	From announcement of results, Q3 1932		From enactment of provisions, Q4 1932	
	Time fixed effect	Ottawa-time interaction	Time fixed effect	Ottawa-time interaction
Agricultural and vegetable products, one year out	0.1411	-0.0845	0.2147	-0.1664
Standard error	0.0700	0.2300	0.0600	0.1000
p-Value	0.0400	0.7200	0.0000	0.0800
	n = 236		n = 236	
Animals and animal products, one year out	0.2463	0.5572	0.2487	0.1560
standard error	0.1100	0.2000	0.1200	0.2600
p-value	0.0200	0.0100	0.0300	0.5500
	n = 236		n = 236	
Chemicals and allied products, one year out	-0.0183	0.5102	0.0328	0.0377
Standard error	0.0500	0.0500	0.1000	0.1000
p-Value	0.7400	0.0000	0.7300	0.6900
	n = 236		n = 236	
Fibers, textiles and products, one year out	0.1214	0.2072	0.2037	0.1038
Standard error	0.0500	0.0700	0.0400	0.0500
p-Value	0.0100	0.0000	0.0000	0.0400
	n = 236		n = 236	
Iron and its products, one year out	0.1909	0.3672	0.2353	0.2050
Standard error	0.0200	0.0300	0.0100	0.0200
p-Value	0.0000	0.0000	0.0000	0.0000
	n = 236		n = 236	
Miscellaneous commodities, one year out	-0.1860	0.1607	-0.0096	0.0198
Standard error	0.0300	0.0300	0.0300	0.0500
p-Value	0.0000	0.0000	0.7700	0.6900
	n = 236		n = 236	
non-ferrous metal products, one year out	0.0322	-0.2849	0.2242	-0.6783
Standard error	0.1500	0.1500	0.0800	0.0800
p-Value	0.8300	0.0600	0.0000	0.0000
	n = 236		n = 236	
non-metallic mineral products, one year out	-0.0084	0.0340	0.2328	0.0774
Standard error	0.0400	0.0400	0.0500	0.0500
p-Value	0.8200	0.3600	0.0000	0.1200
	n = 236		n = 236	
Paper and wood, one year out	-0.0235	0.0370	0.0454	-0.0279
Standard error	0.0200	0.0200	0.0100	0.0300
p-Value	0.1900	0.0500	0.0000	0.3330
	n = 236		n = 236	
Total merchandise imports, one year out	0.0426	0.2067	0.1770	0.0312
Standard error	0.0300	0.0600	0.0300	0.0500
p-Value	0.1000	0.0000	0.0000	0.4900
	n = 236		n = 236	

notes: Each pair of coefficients in columns (1) and (2) are generated from a single regression pooling imports from Q3 1932 and Q3 1933. Each pair of coefficients in columns (3) and (4) are generated from a single regression pooling imports from Q4 1932 and Q4 1933. Poisson pseudo-maximum-likelihood (PPML) used for all regressions. Exporter and importer fixed effects have been suppressed while standard errors are clustered on countries. Australia, India, the Irish Free State, New Zealand, Newfoundland, South Africa, Southern Rhodesia, and the United Kingdom (along with Canada) were signatories at Ottawa. Sources: Bilateral trade data drawn from DBS, *Quarterly Report of the Trade of Canada*, various years.

It should also be re-emphasized that this particular specification controls for all country-specific, but time-variant unobserved variables in particular GDP and the level of the nominal exchange rate. As such, this is by

far the most exacting specification available to test for any effects of the Ottawa Conference on Canadian bilateral trade flows. The results are reported in Table 5 below. The coefficients associated with *Ottawa * Canada * T*

repeat a familiar pattern: no clear results are forthcoming for the periods corresponding to the announcement and enactment of its provisions. Thus, the degree to which the Ottawa Conference altered the patterns of Canadian trade in any meaningful sense remains very much in doubt.

Table 5
Canadian trade in response to Ottawa, incorporating multilateral resistance.

	(1)	(2)	(3)	(4)
	Dependent variable: Canadian exports		Dependent variable: Canadian imports	
	From Q3 1932	From Q4 1932	From Q3 1932	From Q4 19
Ottawa fixed effect	9.1750	5.8515	8.2748	2.4634
Standard error	0.0500	0.0500	0.1500	0.1500
p-Value	0.0000	0.0000	0.0000	0.0000
Canada fixed effect	-2.1718	-2.0973	-2.7120	-2.8254
standard error	0.2200	0.2100	0.2200	0.1900
p-value	0.0000	0.0000	0.0000	0.0000
Ottawa-Canada interaction	1.4764	1.6381	2.2817	2.7404
Standard error	0.2600	0.2400	0.4500	0.3600
p-Value	0.0000	0.0000	0.0000	0.0000
Time fixed effect	-0.8403	-0.9897	2.5235	-1.1180
Standard error	0.0100	0.0100	0.0100	0.0050
p-Value	0.0000	0.0000	0.0000	0.0000
Ottawa-time interaction	0.5480	1.2265	-3.6351	1.7789
Standard error	0.0200	0.0200	0.0300	0.0300
p-Value	0.0000	0.0000	0.0000	0.0000
Canada-time interaction	-0.1967	-0.2016	-0.2450	0.1459
Standard error	0.2000	0.1100	0.2000	0.0800
p-Value	0.3300	0.0600	0.2200	0.0700
Canada-Ottawa-time interaction	0.4221	0.1051	0.6479	-0.5036
Standard error	0.5000	0.1100	0.4300	0.1200
p-Value	0.4000	0.3400	0.1300	0.0000
	n = 380	n = 380	n = 380	n = 380

Notes: Results in column (1) are generated from a single regression pooling exports from Q3 1932 and Q3 1933. Results in column (2) are generated from a single regression pooling exports from Q4 1932 and Q4 1933. Results in column (3) are generated from a single regression pooling imports from Q3 1932 and Q3 1933. Results in column (4) are generated from a single regression pooling imports from Q4 1932 and Q4 1933. Poisson pseudo-maximum-likelihood (PPML) used for all regressions. Exporter and importer fixed effects have been suppressed while standard errors are clustered on countries. Australia, India, the Irish Free State, New Zealand, Newfoundland, South Africa, Southern Rhodesia, and the United Kingdom (along with Canada) were signatories at Ottawa.

Sources: Bilateral trade data drawn from Bureau of the Census, *Monthly Summary of Foreign Commerce of the United States*, various years and DBS, *Quarterly Report of the Trade of Canada*, various years.

6. Putting the Ottawa conference in perspective

Although this paper represents one of the more rigorous assessments of the Ottawa Conference, it is far from the first to have considered its likely effects. Apart from the more narrative-based, contemporary accounts (cf. Lattimer, 1934; MacKay, 1932; Potter, 1932), one of the first attempts at a true quantitative assessment came from Macdougall and Hutt (1954). They are generally of the opinion that the system of preferences introduced at Ottawa and articulated in the intervening twenty years did serve to promote intra-imperial trade. However, they also recognize that any potential identification is confounded by other developments. And in the intervening fifty-plus years, there still seems to be little consensus on the issue.

On one side of the debate, Kindleberger (p. 178, 1989) resolutely claims that the conference was “no great success” in that it engendered “endless discussion” and “dissatisfaction on all parts” but little in way of tangible results. This view is corroborated in contemporary accounts which highlight problems related to adjusting and interpreting the conference’s many clauses (Toynbee, 1935). However, the empirical basis of Kindleberger’s claims remains unclear. Others such as Glickman (1947), Marcus (1954), and Safarian (1970) have just as resolutely claimed beneficial effects on a similarly thin body of data. A slightly more nuanced and data-informed view arose with Capie (1983) who argues for a noted rise in intra-imperial trade which predated 1932 and which could be detected in the aggregate data from as early as the 1870 s. At the same time, he allows that the Ottawa Conference might have reinforced this trend.

This view was first corroborated by Kitson and Solomou (1991) who found that the already rising share of the Empire in British trade seemed to have increased in the 1930s. Even stronger evidence emerges from Eichengreen and Irwin (1995) in a consideration of bilateral trade flows for 34 countries taken from 1928, 1935, and 1938. They find an increase in the value of the coefficient for trade within the British Commonwealth in a standard gravity framework from 1928 to 1935. Furthermore, the difference is found to be statistically significant. Given the wide span of years separating these dates, it is not at all obvious whether this was a consequence of the Ottawa Conference itself or the entrenchment of deep commercial, financial, and monetary linkages within the Empire in the face of a disintegrating world economy, a point which Eichengreen and Irwin carefully acknowledge and which Ritschl and Wolf (2011) confirm.

Part of the confusion with respect to the effects of the Ottawa Conference is perhaps derived from the more fundamental confusion of what its purposes really were. From the perspective of the British, it has been argued that the negotiations and generous concessions, while geared towards the short-term goal of trade creation, also had an eye towards the long-run goal of substituting the British Empire for global markets (Boyce, 2010). From the perspective of Canada and the other Dominions, gaining enhanced access to the UK market was clearly one of their more immediate objectives. But whether this reflected a desire to somehow replace the UK for the US as the primary destination for Canadian exports or more modestly to return Canadian exports to the UK to their pre-1930 levels is unclear (O'Brien and McDonald, 2009). Regardless of what their long-run aspirations were, however, all signatories hoped that the concessions agreed to in Ottawa would significantly lower trade costs among them.

In this respect, it is possible to gauge whether expectations of significant trade cost declines were even reasonable. Jacks et al. (2011) use the following gravity equation which is consistent with nearly all leading theories of international trade,

$$x_{ij}x_{ji} = x_{ii}x_{jj} \left(\frac{t_{ij}t_{ji}}{t_{ii}t_{jj}} \right)^{1-\sigma} \quad (5)$$

Here, the product of bilateral exports is a function of two terms. The first term is the product of domestic trade, that is, how much a country in effect trades with itself. The second term is the product of two trade cost ratios which represent the extent to which bilateral trade costs exceed domestic trade costs. Finally, σ is the elasticity of substitution between domestic and foreign goods. By calculating the logarithm of this expression and taking its first difference, it becomes possible to decompose the growth in bilateral trade into four components: the contribution of output growth, the contribution of changes in income similarity, the contribution of changes in ad-valorem-equivalent bilateral trade costs, and the contribution of changes in multilateral factors.

Thus, assuming all else constant, the relationship between bilateral exports and bilateral trade costs is given by

$$\Delta \ln (x_{ij}x_{ji}) = 2(1-\sigma)\Delta \ln (1 + \tau_{ij}). \quad (6)$$

This implies that, given conditions in August 1932, trade costs would have needed to decline by a sizeable 9.5% to return Canada–UK bilateral trade to its August 1929 level.⁸ Likewise, ad-valorem-equivalent bilateral trade costs would have needed to decline by an astounding 38.7% in order for Canada–UK bilateral trade to reach the August 1929 level of Canada–US bilateral trade. To put these figures in perspective, ad-valorem-equivalent trade costs between Canada and the UK fell by 13.0% for the entire period from 1870 to 1913, a time of rapidly declining communication and transportation costs and significant change in the institutions and policy environment surrounding world trade (Jacks et al., 2010). Clearly, such potential declines would represent overly ambitious—if not audacious—expectations on the downward trajectory of trade costs following the Ottawa Conference.

7. Conclusion

This paper has explored the effects of the *Imperial Economic Conference of, 1932*, particularly in the context of subsequent Canadian bilateral export and import performance. The results have not been particularly kind to the traditional literature which has held that the conference promoted the cause of imperial trade, at least from the Canadian perspective. Across commodities, across exports and imports, across different time horizons, across alternative transformations of the data, and across different specifications, we identify few economically and statistically significant effects of the conference in the extensive bilateral trade data at hand. Indeed, the data suggest that any hopes of recovering the ground lost from 1929 were wedded with unrealistic expectations as to the efficacy and limits of commercial policy.

The paper has also highlighted the asymmetric nature of the forces shaping North American economic history, as seen in the trading relation between Canada and the United States. Although the former is dominated by

⁸ Canadian real exports to the UK stood at \$185,293,223 while Canadian real imports from the UK stood at \$152,224,105 in August 1929. Canadian real exports to the UK stood at \$185,090,732 while Canadian real imports from the UK stood at \$79,123,309 in August 1932. Canadian real exports to the US stood at \$411,059,720 while Canadian real imports from the US stood at \$632,077,286 in August 1929. Finally, the Canadian–UK bilateral trade cost in 1932 was equal to 0.9208. Assuming a value of eight for sigma, all that remains is to calculate the hypothetical value for the bilateral trade cost in Eq. (6).

the latter, especially with respect to commercial policy, the experience of the years from 1929 to 1932 demonstrated the utter folly of either country attempting to “defy gravity” and sever the links of capital and trade which had served to not only deepen the division of labor between them but also enhance their joint material well-being. In this sense, the paper has implicitly invoked the perennial dilemma of small-to-medium sized economies in tying their fortunes to a dominant trade partner and suffering at their whim or going it alone and thereby foregoing potential productivity and welfare gains. Likewise, the paper has served as a reminder that there have been at least some lessons learned from economic history, particularly in the context of commercial policy. And nowhere can this be seen more clearly than in the recent experience surrounding the second great trade bust of the past century: at no time did the Canadian commitment to free trade seriously waver in the past few years.

At the same time, the paper opens a number of issues. One of the most glaring of which is that we still lack a complete quantitative assessment of the forces which were responsible for the collapse of world trade from 1929 to 1933 and which provided the backdrop to the developments at Ottawa. Pet theories abound, but even eighty years on, not enough work has been done in systematically relating changes in the various policy, transaction, and transport frictions as well as global output in driving the trade bust. Apart from antiquarian interests, this episode is important in that it represents one of the few documented and generalized trade collapses in world history. What is more, the mechanisms seemingly at work in the case of Canadian bilateral trade in this period suggest there may be some here-to-fore unexplored forces to be considered.

First is the role of certainty over the likely course of commercial policy in the decision set of exporters and importers alike. Leo Amery was almost certainly correct in his prognosis that “unless the manufacturers and farmers of the Empire have some definite assurance they cannot embark on any policy of development...who is going to build a railway or develop a port on the assurance of an export trade, the conditions of which may be destroyed before the building is finished?” (1932, p. 687). Given the evidence on the necessary role of beachhead activity by exporting firms and the existence of substantial fixed costs to trading activity (Bernard et al., 2007), such concerns are likely to have been a critical element holding back the re-orientation of Canadian trade in

this period. This is especially true in light of the fact that informational barriers to trade have almost certainly fallen over time. Thus, it stands to reason that if these constraints are important in the present, they were almost certainly more binding in the past, a point which has been recently and strongly emphasized in the literature on the political economy of trade agreements (Limao and Maggi, 2013).

Second, and very much relatedly, the question arises whether the Canadian commitment to re-orienting its trade away from the United States and towards the rest of the British Empire was even credible. Of course, developments over the past eighty years suggest not. However, contemporary accounts also seemed doubtful on this front (“Afterthoughts on the Conference”, 1932; “An Ottawa Impression”, 1932). This doubt was certainly not assuaged when as early as January 1933 Canadian Prime Minister Bennett opened the door to trade negotiations with the United States, remarking before the Toronto Board of Trade that “geographically, we are part of the North American continent...and it gives me no joy to remind you also that financially it is in the same position” (quoted in O’Brien and McDonald, 2009, p. 352). Clearly, from the perspective of firms engaged in international trade, the official Canadian position of defying the inexorable pull exerted by the combined economic mass and geographic proximity of the US was untenable. And the subsequent re-orientation towards the US in its commercial policy was, therefore, likely expected.

Finally, a thread of analysis which is prominent in accounts from the 1930s but which has been successively played down through time is the role of endogenous changes in consumer taste. It is standard in much of the literature to assume that some degree of home bias in international trade exists. It is also standard to assume that this bias is constant. The experience of the interwar period suggests that unobserved changes in home—or in this case, imperial—bias brought about by the radical changes in commercial policy may have significantly altered the orientation of world trade in this period. Frieden (2006) and Irwin (2011) both present some compelling examples of the worldwide consumer response to US goods in the wake of Smoot–Hawley. Generalizing this response and framing it within the context of standard models of consumer demand as well as incorporating the aforementioned elements of certainty and credibility remain promising ways forward for assessing the forces driving the collapse and re-orientation of trade, both in the past and present.

Appendix 1

This appendix enumerates the principal goods in each of the commodity classifications introduced in Section 3. Although non-exhaustive, the list of goods in each sub-heading represents the majority of the value of trade therein. Note that the Agricultural and Vegetable Products and Animals and Animal Products categories are combined in the source.

	Exports	Imports
Agricultural and other primary products	Apples; barley; oats; rye; wheat; oatmeal; wheat flour; fresh beef and veal; dressed or undressed poultry; bacon and hams; cattle for improvement of stock; dairy cattle over 700 lb; cattle over 700 lb; cheese; condensed milk; evaporated milk; dried eggs; frozen eggs; eggs in shell; fresh cod fillets; fresh halibut; fresh lobster; fresh salmon; fresh whitefish; dried cod; canned sea herring; canned lobster; canned salmon; malt; maple sugar; whiskey; bright flue cured tobacco; undressed beaver skins; undressed black and silver fox; undressed mink; undressed muskrat; cattle hides and skins; sole leather; upper leather; linseed and flaxseed oil; alfalfa clover seed; hay.	Bananas; grapefruit; oranges, mandarins, etc.; dates; figs; prunes; raisins; desiccated coconut; green peanuts; shelled almonds; shelled walnuts; other shelled nuts; cabbage; carrots; onions; potatoes, other than seed; tomatoes; Indian corn; uncleaned rice; molasses; raw sugar for refining; cocoa beans, not roasted; butter; whale oil; edible gelatin; green coffee; black tea of Ceylon; black tea of India; whiskey; bright flue-cured tobacco; unstemmed cigar leaf; essential oil; palm oil; crude peanut oil; tallow; undressed muskrat fur; other undressed fur; raw calf skins and kips; raw cattle hides; raw sheep skins; hops; spirits of turpentine.
Fibers and textiles	Cotton fabric; raw wool; rayon and its products; bags and waste; binder twine; other textiles.	Raw cotton; cotton fabrics; bleached or dyed; unbleached cotton fabrics; wool in the grease; washed or second wool; worsted tops; yarns or warps for manufacture; worsted and serges; art-silk acetate yarn (singles); art-silk staple fiber; synthetic fabric; unbleached jute fabric; sisa, istle, an tampico fabric; rags and waste for manufactures; waste for wiping rags; oilcloth and floor linoleum.
Lumber, pulp, and paper	Douglas fir logs; telegraph poles; birch planks and boards; cedar planks and boards; Douglas fir; hemlock; pine; spruce; Douglas fir square timber; red cedar shingles; plywood; poplar pulpwood; other peeled pulpwood; other unpeeled pulpwood; sulfate woodpulp; bleached sulfite dissolving pulp; bleached sulfite paper pulp; unbleached sulfite strong pulp; unbleached sulfite news pulp; mechanical woodpulp; newsprint paper.	Oak; furniture; unbleached sulfite woodpulp; newspapers and periodicals; book and other paper.
Iron and steel and their manufactures	Ferro-manganese; ferro-silicon; steel and iron billets, ingots, and blooms; scrap; railway rails; locomotives and cars; agricultural implements; motor vehicles and parts; machinery and parts.	Iron ore; wrought scrap; hot rolled bars and billets; sheets 060 “and less thick”; sheets coated with tin; skelp; angle beams, 35 lb and over; machinery and equipment; agricultural equipment; motor vehicles and parts; hardware and other manufactures.
Non-ferrous metals and their manufactures	Aluminum bars, ingots, and blooms; aluminum rods, sheets, and circles; fine copper; copper ingots, bars, and billets; copper rods, strips, and sheets; lead in pigs; nickel in matte; nickel in oxide; fine nickel; platinum in ore concentrates; silver in ore concentrates; silver bullion; zinc spelter; other manufactures (including clocks, watches, and print and electrical equipment).	Bauxite ore; tin in blocks, pigs, and bars; manganese oxide.
Chemicals and fertilizers	Ammonium sulfate; phosphate fertilizer; other manufactured fertilizer; paints and paint materials; soda and sodium compounds; other miscellaneous chemicals.	Aniline dyes, 1 lb and over; quebracho extract; phosphate rock; crude muriate of potash; superphosphate; acids, drugs, and pharmaceuticals; paints and paint material; sodium compounds; compounds of tetraethyl lead; ethylene glycol.
Miscellaneous	Crude rubber; rubber boots and shoes; tire casings; electrical energy; settlers’ effects; donations and gifts; other.	Rubber; tire casings; vegetable and mineral wax; house furnishings; apparel.

Sources: DBS, “Export and Import Price Indexes 1926–1948,” 1949.

Appendix 2

This appendix enumerates the 10 principal destinations and origins of the commodity classifications introduced in Section 3 for 1931/35. Although non-exhaustive, the list of countries in each sub-heading represents the majority of the value of trade therein.

	Exports	Imports
Agricultural and other primary products	The United Kingdom (55%), the United States (15%), France (5%), Belgium (4%), the Netherlands (3%), Germany (2%), Japan (2%), Italy (1%), China (1%), Irish Free State (1%).	The United States (36%), the United Kingdom (19%), Australia (4%), South Africa (3%), Jamaica (3%), Barbados (3%), France (3%), British Guiana (2%), India (2%), Argentina (2%).
Fibers and textiles	The United Kingdom (26%), the United States (24%), South Africa (12%), Australia (11%), New Zealand (6%), Argentina (1%), Mexico (1%), Jamaica (1%), Japan (1%), Belgium (1%).	The United Kingdom (42%), the United States (37%), India (3%), France (3%), Japan (2%), the Netherlands (2%), Germany (2%), Australia (1%), Switzerland (1%), Italy (1%).
Lumber, pulp, and paper	The United States (74%), the United Kingdom (12%), Australia (3%), Japan (3%), China (1%), Argentina (1%), New Zealand (1%), South Africa (1%), France (<1%), Irish Free State (<1%).	The United States (77%), the United Kingdom (15%), France (3%), Germany (1%), Belgium (1%), Spain (1%), Portugal (<1%), Japan (<1%), Norway (<1%), Sweden (<1%).
Iron and steel and their manufactures	The United Kingdom (23%), Australia (14%), South Africa (13%), the United States (12%), New Zealand (5%), India (5%), Spain (5%), Argentina (3%), Brazil (2%).	The United States (77%), the United Kingdom (18%), Germany (1%), Sweden (1%), Belgium (1%), France (1%), the Netherlands (1%), Switzerland (<1%), Norway (<1%), Czechoslovakia (<1%).
Non-ferrous metals and their manufactures	The United Kingdom (40%), the United States (35%), Japan (5%), the Netherlands (4%), Norway (2%), Germany (2%), China (2%), France (2%), India (2%), Belgium (2%).	The United States (74%), the United Kingdom (15%), Germany (3%), Switzerland (3%), Straits Settlements (1%), Gold Coast (1%), France (1%), Hong Kong (<1%), Japan (<1%), Belgium (<1%).
Chemicals and fertilizers	The United States (47%), the United Kingdom (23%), Mexico (8%), Portuguese Africa (5%), Australia (1%), India (1%), China (1%), Cuba (1%), the Netherlands (1%), the Philippines (1%).	The United States (61%), the United Kingdom (19%), Germany (9%), France (3%), the Netherlands (2%), Switzerland (2%), Belgium (15%), Japan (<1%), <u>Argentina (<1%), Italy (<1%).</u>
Miscellaneous	The United States (59%), the United Kingdom (24%), Australia (3%), Japan (2%), Barbados (1%), China (1%), Italy (1%), France (1%), South Africa (1%), Bermuda (1%).	The United States (67%), the United Kingdom (18%), Germany (5%), France (2%), Japan (2%), Czechoslovakia (1%), Italy (1%), India (<1%), Belgium (<1%), Switzerland (<1%).

Sources: DBS, *Quarterly Report of the Trade of Canada*, various years.

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