

Cambridge University Press
0521617065 - Canada and the Gold Standard: Balance-of-Payments Adjustment,
1871-1913

Trevor J. O. Dick and John E. Floyd

Excerpt

[More information](#)

1. Introduction

This monograph is more than a study in Canadian economic history – it refines and tests a modern portfolio theory of balance-of-payments adjustment under gold standard conditions. It is a study of how Canada's economy adjusted to the massive inflow of capital in the early years of the twentieth century and how her monetary system functioned within the international gold standard. It is also a test of a particular theory of gold standard adjustment, a theory built on the assumption of an integrated world market for capital assets. This theory implies a radically different balance-of-payments adjustment process than the traditional classical price-specie-flow mechanism. And we believe it explains the evidence better than does the traditional theory.

Our study follows a long and venerable tradition. In 1924, Jacob Viner published a celebrated study of Canada's balance of payments for the period 1900–13. His work was one of a number of empirical studies by students of F. W. Taussig at Harvard University.¹ Of these studies, Viner's attracted the most attention because it provided a vigorous defense of the traditional classical theory of balance-of-payments adjustment. This provoked strong criticism both at the time and over the years since publication and, despite continued scholarly efforts to rethink the theory and reexamine the data, the controversies have never been satisfactorily resolved. Neither have a number of related controversies about the operation of the gold standard, in particular, the sterilization of gold flows, the role of the Bank of England, and the importance of capital movements in the adjustment process. Although most scholars organize their thinking within the standard classical framework, there are dissident opinions.

¹ Other studies in the group include Williams (1920), Graham (1922), White (1933), and Beach (1935). Williams studies the adjustment mechanism for Argentina under depreciated paper. Graham focuses on the effects of British capital flows into the United States during the greenback period. White's study examines the effects of capital exports from France during the years 1880–1913. Beach studies capital outflows from Britain during the same period.

Cambridge University Press
0521617065 - Canada and the Gold Standard: Balance-of-Payments Adjustment,
1871-1913

Trevor J. O. Dick and John E. Floyd

Excerpt

[More information](#)

2 Canada and the gold standard

The Canadian experience before the Great War is an ideal testing ground for theories of balance-of-payments adjustment – another reason why Viner's work attracted more attention than its companion studies. An enormous inflow of capital occurred during the first decade and a half of the twentieth century. Absorption of this capital necessitated very substantial real and monetary adjustments within the Canadian economy. The question was and still is: What form did these adjustments take?

This monograph reexamines the adjustment mechanism from a fresh theoretical perspective. We incorporate international capital mobility within a framework of joint intercountry portfolio equilibrium. Balance-of-payments adjustments are once-and-for-all exchanges of money and nonmonetary assets, with little if any change in the balance of trade. In the traditional classical price-specie-flow mechanism, balance-of-payments adjustments involve deficits and surpluses in the balance of trade brought about by changes in domestic relative to foreign price levels.

Our theoretical framework has roots going back over three decades. The classic papers of Fleming (1962) and Mundell (1963) established important fundamentals of the adjustment process under perfect capital mobility, but their analysis did not explicitly incorporate stocks and flows and therefore did not generalize easily to handle imperfect capital mobility. Much earlier, Johnson (1958a) outlined carefully the distinction between stock and flow balance-of-payments adjustments. He did not, however, properly integrate these concepts with the standard model and his work was ignored for over a decade.

In the late 1960s McKinnon and Oates (1966) again addressed the stock-flow problem and Floyd (1969a, 1969b) and Harkness (1969) developed explicit balance-of-payments stock-adjustment models.² These works drew attention to serious problems with the standard generalization of the Mundell–Fleming model to the analysis of imperfect capital mobility. In particular, the fallacy of treating capital flows as a function of international differences in interest rates became recognized. A simple integrated model of stocks and flows failed to emerge, however, because the analysis did not correctly integrate balance-of-payments flow adjustments. Early revisionist work was thus eclipsed by the newly emerging monetary approach to balance-of-payments theory developed in the early 1970s by Mundell and Johnson and their students at the University of Chicago.³

² See also Willett and Forte (1969) and Miller and Whitman (1970).

³ Some of the early contributions to this literature are in Frenkel and Johnson (1976).

Cambridge University Press
0521617065 - Canada and the Gold Standard: Balance-of-Payments Adjustment,
1871-1913

Trevor J. O. Dick and John E. Floyd

Excerpt

[More information](#)

Introduction

3

The monetary approach interpreted balance-of-payments adjustments as strictly monetary phenomena, rediscovering and reworking much of traditional classical balance-of-payments analysis. In the process, international stock adjustments and the analysis of international capital movements in general were again relegated to the back burner. Nevertheless, the old Mundell–Fleming model, which correctly handles monetary shocks when capital is perfectly mobile, remained integral, if often implicit, in many papers.

Capital movements and stock/flow equilibrium again receive explicit attention in a paper by Frenkel and Rodriguez (1975) and stock/flow equilibrium with perfect capital mobility forms a cornerstone of Mussa's (1982) analysis of exchange-rate dynamics under rational expectations. Following Floyd (1985), our theoretical formulation further extends the analysis of perfect and imperfect capital mobility, integrating much of the earlier literature in a simple straightforward stock/flow equilibrium framework.

As it applies to the gold standard, our theory has an important precedent in two recent papers by McCloskey and Zecher (1976, 1984). Their work follows the monetary approach, interpreting balance-of-payments adjustments and the associated gold movements as strictly monetary phenomena. International capital mobility is implicit in their model. They appear to have in mind an adjustment process similar to ours, although they do not rigorously develop the theoretical framework within which balance-of-payments adjustments operate. They argue instead that "purchasing power parity" was essential to the adjustment process.

Our analysis supports and extends McCloskey and Zecher's conclusions about balance-of-payments adjustment. We develop rigorously a portfolio equilibrium foundation for their position and test it empirically in ways suggested by our theory. We find no support for the purchasing-power parity doctrine as traditionally defined. We do find support for the view that the price levels of the individual countries are linked together under a gold standard when capital is internationally mobile. The link is not the rigid and direct one implied by the standard theory of purchasing-power parity, however.⁴

In our theory, interest rates in the various countries are linked together in a unified world market for assets. There is freedom of international exchange combined with differences in risk. An excess demand or supply

⁴ A careful reading of McCloskey and Zecher's work, supplemented by correspondence and conversation with them, confirms that they in fact have this less rigid linkage among country price levels in mind when they are defending purchasing-power parity.

Cambridge University Press
 0521617065 - Canada and the Gold Standard: Balance-of-Payments Adjustment,
 1871-1913

Trevor J. O. Dick and John E. Floyd

Excerpt

[More information](#)

4 Canada and the gold standard

of money in one part of the world leads to a once-and-for-all exchange of money and assets. The result is a one-shot transfer of gold as world portfolio equilibrium is reestablished. This balance-of-payments adjustment is largely independent of the countries' relative price levels.

The ratio of each country's price level to the price level abroad is determined by the world (including home) demand for that country's goods relative to goods abroad. Gold flows between countries to satisfy changes in the demand for money that arise from changes in incomes and relative price levels. These are induced by exogenous real-sector developments such as shifts in the allocation of world investment among countries, changes in individual country's savings rates, and changes in technology and tastes with respect to various countries' goods. For individual countries, money holdings are determined by prices and not the other way around as the traditional classical theory implies.

For the world as a whole, however, money determines prices in accordance with the standard quantity theory. The situation is exactly analogous to regions within a country, as McCloskey and Zecher (1976) recognize. Given world monetary conditions, the price level in Illinois is determined by the demand and supply conditions for the goods produced in that state, with Illinois residents acquiring the necessary money balances by exchanging assets for them. Illinois residents can have an effect on the price level in Illinois only if they own a significant fraction of the U.S. (more correctly, world) money supply. On the other hand, a change in the world demand for money leads to a change in the price level everywhere, including Illinois.

Our analysis resolves anomalies that, as Bordo (1984) notes, begin to appear in the traditional gold standard theory after the turn of the century. The first of these is what Triffin called the "overall parallelism – rather than divergence – of price movements, expressed in the same unit of measurement, between the various trading countries maintaining a minimum degree of freedom of trade and exchange in their international transactions."⁵ British balance-of-payments adjustments, for example, occurred remarkably smoothly with none of the wrenching relative price level divergences implied by the traditional theory.

A second major anomaly is the evidence that most central banks did not play by the rules of the gold standard game. Bloomfield notes that "central banks in general played the rules of the game just as badly before 1914

⁵ Triffin (1964, p. 4).

Cambridge University Press
 0521617065 - Canada and the Gold Standard: Balance-of-Payments Adjustment,
 1871-1913

Trevor J. O. Dick and John E. Floyd

Excerpt

[More information](#)

Introduction

5

as they did thereafter.’’⁶ How could the gold standard have survived if this was in fact the case?

The third anomaly is the parallelism, again to use Triffin’s term, in interest-rate movements among countries. The standard view is that discount-rate increases are undertaken by deficit countries to relieve a drain of their reserves to surplus countries. As Bloomfield notes, however, the discount rates of virtually all countries tend to rise and fall together over the course of the world business cycle. There is no evidence of the relationship between interest rates and gold flows implied by the traditional theory.⁷

In reacting to these anomalies, both Triffin (1964) and Williamson (1961, 1963) suggest viewing the adjustment process in a general equilibrium context. The price levels of the various countries should be closely linked with balance-of-payments adjustments, reflecting money-market disequilibria and their elimination. This is precisely the tack we take in the research presented here.

The anomalies are easily explained when the theory is formulated in general equilibrium terms, with capital mobility appropriately incorporated. The parallelism in prices arises because the mechanism of adjustment works through one-shot portfolio adjustments and not through relative price effects on the balance of trade. There is no reason to observe divergences of price levels in connection with balance-of-payments disequilibria.

Central banks do not appear to play according to the conventional rules because the rules are not what the traditional classical theorists thought them to be. Under a gold standard central banks face constraints, not rules. Apart from affecting the world demand for gold, not a practical option for even the largest countries, they have no control over their domestic money supplies in either the short or long runs. They cannot sterilize the effects of gold flows if they want to. On the other hand, changes in the reserve ratios of the commercial banks or in the public’s desired ratio of gold to total money holdings in a particular country result in gold flows without money-supply changes. This makes it appear as though the country’s central bank is sterilizing the effects of gold flows on the money supply.

Changes in central banks’ desired ratios of gold holdings to money supply also result in gold flows without money-supply changes. Since these gold movements cannot affect the level of domestic economic activity, any

⁶ Bloomfield (1959, p. 50).

⁷ Bloomfield (1959, pp. 35–7).

Cambridge University Press

0521617065 - Canada and the Gold Standard: Balance-of-Payments Adjustment, 1871-1913

Trevor J. O. Dick and John E. Floyd

Excerpt

[More information](#)

6 Canada and the gold standard

attempt by the authorities to pursue monetary independence is unsuccessful. Yet changes in central bank reserve ratios may nevertheless occur because of changes in the opportunity costs of holding reserves and the perceived risk of a run on gold.

Our analysis also clarifies a number of issues relating to interest rates and international capital and gold flows. First, we establish that international capital flows in the aggregate do not “respond” to international differences in interest rates. The conditions of world portfolio equilibrium simultaneously determine interest-rate levels and the allocation of the ownership of each country’s assets among all countries’ residents. This accounts for the parallelism in interest rates. The steady-state flows of capital depend on savings rates and the allocation of world investment. One might observe on occasion a correlation (either positive or negative) between international capital flows and interest differentials. There is no reason, however, to expect a relationship of the sort postulated in the traditional classical approach.

Our analysis confirms the classical view that tightening domestic credit is an effective method of stimulating gold inflows and discouraging outflows, but such a policy is not likely to create an observable interest-rate differential when domestic and foreign assets are good substitutes in portfolios and gold flows are relatively small in relation to the outstanding stocks of every country’s assets. In addition, changes in the rediscount rate do not affect domestic credit independently of the actual rediscounting and open-market operations by the central bank. Rediscount rates will thus be less related to capital and gold flows than are short-term rates generally. In any case, the validity of the classical theory turns on interest-rate differentials, not levels.

Our task in the chapters that follow is to develop the theory supporting the above claims and marshal the evidence to substantiate it. Our theoretical results are applicable to all countries, large and small. Because we restrict our empirical work to the Canadian experience, however, our efforts are necessarily less than a comprehensive analysis of the gold standard overall. We present a thorough analysis of Canada’s role in the gold standard and of the financial and balance-of-payments implications of the remarkable growth of the Canadian economy during the study period. Our empirical findings for Canada lend strong support to our views about how the international gold standard functioned, but further tests, using data for other countries, are necessary to fully substantiate our theory.

The time period chosen for our study, 1871–1913, corresponds approx-

Cambridge University Press
 0521617065 - Canada and the Gold Standard: Balance-of-Payments Adjustment,
 1871-1913

Trevor J. O. Dick and John E. Floyd

Excerpt

[More information](#)

Introduction

7

imately to the period during which Canada continuously adhered to the gold standard. Canada had no formal central bank but the Canadian chartered banks and the Dominion government maintained convertibility of bank and Dominion notes, respectively, into gold. American and British coins also circulated as legal tender at fixed rates defined in terms of gold. Except for the greenback era in the United States (1862–79), our period is also a time when Canada's major trading partners adhered to the gold standard.

In terms of consistent data series, 1871 – the year of the first Dominion banking act – provides a convenient starting point for our analysis.⁸ With the passage of the Finance Act in 1914, the Dominion government provided for commercial bank borrowing from the government in a way that broke the link between the money supply and gold maintained in the preceding gold-standard era. We therefore conclude our empirical study with 1913.

Our empirical evidence is more complete than that used by Viner, who restricted himself to the years 1900 to 1913. We take the same long-period historical perspective of most other gold standard scholars, notably Williams (1920), White (1933), Beach (1935), and Bloomfield (1959). All data we use are described and listed in the three appendixes.

In the next chapter we review the standard classical theory of adjustment as presented by Viner (1924, 1937) and outline the evidence uncovered in his classic study. Chapter 3 develops the modern portfolio theory of adjustment in its simplest form within the context of the pre-War Canadian institutional setting. We begin with a verbal statement of the model and then proceed to a more formal mathematical presentation of price-level and money-supply determination. The formal model is constructed on the working assumption that capital is perfectly mobile between Canada and the rest of the world.

Chapter 4 reviews the data and presents an empirical overview of developments in the Canadian economy during the study period. Chapters 5, 6, and 7 present our empirical tests. Chapter 5 states and empirically tests a group of hypotheses that parallel those tested by Viner. These tests deal with the question of whether the relationship between the net capital inflow and the balance of trade is consistent with the predictions of theory and whether there are stable relationships between the quantity of money demanded by the public and the quantities of primary and secondary re-

⁸ Nova Scotia, New Brunswick, Quebec, and Ontario formed the Dominion of Canada at Confederation in 1867. Manitoba joined in 1870, British Columbia in 1871, and Prince Edward Island in 1873.

Cambridge University Press

0521617065 - Canada and the Gold Standard: Balance-of-Payments Adjustment, 1871-1913

Trevor J. O. Dick and John E. Floyd

Excerpt

[More information](#)

8 Canada and the gold standard

serves held by the banks and interest rates, real income, and the scale of the economy. The evidence here is fully consistent with our view of the adjustment mechanism. But it is also consistent with the classical interpretation. On the basis of these tests alone, only a few small pieces of evidence favor our theory over the traditional one.

Chapter 6 presents an empirical analysis of international reserve flows. First we test restrictions implied by the differing implications of our theory and the classical one with respect to the relationship between the balance of trade and the balance of payments under international capital mobility. Our theory is consistent with the evidence but the classical approach fails to explain it, largely because it cannot explain the capital account. Second, we conduct a series of nonnested hypotheses tests which further support our theory in preference to the traditional specie-flow mechanism. Finally, we examine the evidence on the responsiveness of net capital movements to international differences in interest rates. No strong empirical relationship between international capital flows and short-term interest-rate differentials is found. These results in Chapter 6 overwhelmingly support our theoretical interpretation and reject the standard view.

Chapter 7 focuses attention on two further empirical issues raised by the confrontation of our theory with the traditional classical one. The first is the question of timing and causality. On preliminary investigation it is found that insufficient lagged relationships are present in the data series to permit Granger–Sims causality tests.⁹ This conclusion that no lags can be identified favors our theory, which does not require any lags. The second issue is the contemporaneous statistical relationship between Canadian money and the price level of the rest of the world, holding constant the foreign money supply and real income. Neither our theory nor the traditional one postulates a causal effect of Canadian money on foreign prices, but our theory can explain the observed contemporaneous correlation between these two variables while the traditional theory cannot.

We turn in Chapter 8 to a detailed analysis of Viner's work and the criticisms of it over the years. Our theory, we argue, provides a cleaner explanation of the causal and circumstantial evidence presented by Viner, and nullifies most of the criticisms of it. The major criticisms reflect, in our view, uneasiness over the seeming absence of a causal effect of the capital inflows on gold flows and hence domestic prices. Our contribution

⁹ We are using only annual data series. Although some monthly and quarterly data exist, there are not enough series to permit a full testing of our model at this level. It would take another major project to remedy these data deficiencies, if indeed they could be remedied.

Cambridge University Press
0521617065 - Canada and the Gold Standard: Balance-of-Payments Adjustment,
1871-1913

Trevor J. O. Dick and John E. Floyd

Excerpt

[More information](#)

Introduction

9

is to provide the model that articulates these criticisms and reinterprets the evidence in the light of them. This chapter also reviews the evidence uncovered in extensive recent work by Georg Rich. Rich gives this evidence the traditional interpretation but it is also consistent with our portfolio approach to the adjustment mechanism.

In Chapter 9 we shift direction and pose the theoretical question: Can one derive the classical adjustment mechanism from the principles of wealth maximization, subject to the usual constraints, when the assets of various countries differ in risk and therefore are not perfect substitutes in portfolios? In other words, can we construct the traditional adjustment mechanism from an assumption of imperfect mobility of capital? To answer this question, we undertake a further formal development of the theoretical model presented in Chapter 3. We conclude that the traditional classical theory is inconsistent with maximizing behavior of individual wealth-owners even when the assets of various countries are not perfect substitutes in portfolios and there are barriers to trade in individual assets. The traditional classical mechanism is consistent with maximizing behavior only when *no* international movements of capital are possible. Therefore, the fact that substantial freedom of international trade in assets exists under the international gold standard becomes in itself strong evidence in favor of our theory of the adjustment mechanism.

In Chapter 10 we review the main features of Canada's balance-of-payments history before 1914 and use the portfolio theory of adjustment to provide response scenarios for the principal episodes of external shock associated with capital inflow. Our reinterpretation shows how the gold-standard regime smoothly accommodated an important source of economic growth. We also observe how the growing relative historical importance of the capital account has drawn attention to the distinction between the balance of payments and the balance of trade, and undermined the usefulness of the price-specie-flow mechanism for understanding balance-of-payments adjustments.

Chapter 11, the final chapter, reviews our findings about the adjustment mechanism in the Canadian case and outlines what they imply about how the international gold standard must have worked. These implications represent a challenge for further empirical research.

Cambridge University Press
0521617065 - Canada and the Gold Standard: Balance-of-Payments Adjustment,
1871-1913

Trevor J. O. Dick and John E. Floyd

Excerpt

[More information](#)

2. The standard neoclassical specie-flow mechanism

The classical mechanism of international monetary adjustment can be traced back at least to David Hume. Perhaps the best modern statement is due to Jacob Viner.¹ The standard version states that gold flows automatically between countries to adjust their levels of money and prices to maintain balance-of-payments equilibrium. An excess supply of money in the domestic economy causes a rise in the domestic price level relative to the price level abroad. Domestic goods become relatively more expensive in world markets, causing exports to fall and imports to increase. The resulting deficit in the balance of payments leads to an outflow of gold, reversing the movement of domestic relative to foreign price levels. This process redistributes the world gold stock among countries until relative domestic and foreign price levels consistent with balance-of-payments equilibrium are reestablished.

The mechanism of adjustment operates essentially the same way for real shocks. Assume, for example, an exogenous increase in domestic exports. The balance of payments improves and gold flows in. The resulting increase in the money supply causes the domestic price level to increase relative to the foreign price level. Domestic goods become relatively more expensive in world markets, increasing imports and reducing exports until balance-of-payments equilibrium is reestablished. Gold movements act as a means of adjusting domestic and foreign prices to the increase in demand for domestic goods in world markets.

A minor refinement deals with the effects of exchange-rate movements on the balance of trade. When an increase in exports relative to imports is required, a part of the adjustment can be brought about by a devaluation of the domestic currency to the gold export point. If the cost of transporting gold is significant, this movement of the exchange rate can bring about an increase in exports relative to imports without a flow of gold. Similarly,

¹ See Viner (1937, chapters 6 and 7) and Hume (1752, pp. 330–41, and 343–5).