

# The GOLD Standard in Theory and History

EDITED BY BARRY EICHENGREEN

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***THE***

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***GOLD STANDARD***

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***IN THEORY AND HISTORY***

*Edited by*

***BARRY EICHENGREEN***

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## *Editor's introduction<sup>1</sup>*

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***Barry Eichengreen***

The international monetary system is part of the institutional framework that binds national economies together. An ideally functioning system permits producers to specialize in goods in which the nation has a comparative advantage and savers to search beyond national borders for profitable investment opportunities. It does so by combining the virtues of stability and flexibility. Stability in the market for foreign exchange minimizes the volatility of import and export prices, permitting producers and consumers to exploit fully the advantages of international specialization. Flexibility in the operation of the international monetary system permits the divergent objectives of national economic authorities to be reconciled with one another.

The one point upon which critics of our present system of flexible exchange rates agree is that it fails to combine these virtues. It provides neither the stability conducive to international specialization nor the flexibility required for independent action. Turbulence in international financial markets continues to disrupt firms' production and investment decisions. It gives rise to seriously misaligned exchange rates which confer on certain national producers an arbitrary (if temporary) competitive advantage. The penetration of imports leads to protectionist measures which are not easily eliminated once exchange rate movements are reversed. At the same time, short-term capital flows undermine the ability of national authorities to pursue independent economic policies. Governments, finding themselves chronically unable to coordinate policies with one another, are tempted to restore their independence of action through the imposition of exchange controls which are then circumvented by the private sector at considerable cost.

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Along with dissatisfaction with the system's operation come proposals for international monetary reform. The search becomes one for a model or precedent after which institutional reform might be patterned. It is here that the appeal of the gold standard is to be found. More precisely, it is an idealized vision of the gold standard that is appealing. In this idealization, the gold standard was a remarkably durable and efficient mechanism for insuring price and income stability, relieving balance-of-payments pressure, and reconciling the actions of national monetary authorities. Supposedly it combined these virtues because it worked automatically, limiting the scope for discretionary policy. Money supplies in each country were linked directly to domestic reserves of gold, and balance-of-payments adjustment was accomplished through international shipments of precious metal. Monetary authorities were restrained from indulging their preference for inflationary finance, and the relative stability of prices that resulted was conducive to steady income growth. Since the authorities in each country were subject to the same gold standard constraints, the system brought about a *de facto* harmonization of monetary policies without requiring explicit co-ordination. Thus seen, the gold standard is a tempting model of international monetary reform for those inclined towards policy predicated on rules rather than discretion.

This vision of the gold standard, like the unicorn in James Thurber's garden, is of course a mythical beast. Far from the normal state of affairs prior to the twentieth century, the gold standard existed on a global scale for scarcely a third of a century. Comparisons of price and income stability under the gold standard and under other monetary regimes yield ambiguous results and are extremely sensitive to the measures of stability used. Debtor and creditor countries seem to have had radically different experiences during the gold standard era. The gold standard did not prevent the international transmission of financial crises nor did it preclude the occasional forced suspension of convertibility. The discretionary actions of national monetary authorities featured prominently in the gold standard's actual operation both under normal circumstances and in periods of exceptional stress.

If we reject the myth of gold standard we are confronted with the question of how the system actually worked. Regrettably, there exists no comprehensive account of the gold standard's operation as an international monetary system. Elements of the answer can be found, however, in two very different literatures, those of economic theory and economic history. In the literature of economic theory we find formal models of the gold standard as a self-equilibrating system of markets. One class of models focuses on the mechanism by which balance-of-payments equilibrium is restored. While the best-known example is the price-specie-flow mechanism associated with David Hume (1752) (essay reproduced in this volume, pp. 39–48), there exist alternative models of how balance-of-payments equilibrium is restored under a gold standard regime. A second class of models formalizes the mechanism by which tendencies internal



to the gold standard may moderate price-level fluctuations over long periods. The recent article by Barro (1979) (reproduced, pp. 81–99) provides an elegant statement of this stabilizing mechanism. These models are useful for gauging the internal consistency of accounts of the gold standard's operation. But by their stylized nature they inevitably abstract from other aspects of the gold standard mechanism, and they shed more light on the myth of the gold standard than on the historical reality.

In the literature of economic history we find in contrast detailed studies of aspects of the gold standard's operation. Some consider its impact on particular countries or, as in the work of Ford (1962) and de Cecco (1974), on the relations between countries. Others focus on the role of central banks or, as in the work of Clay (1957), particular central bankers. These studies appear to have little in common with the outlines of the gold standard myth or the theories of international finance. Although they provide a wealth of institutional and historical detail on particular episodes and individual markets, by their detailed and idiosyncratic nature contributions to this literature tend to discourage efforts to generalize about how the gold standard worked.

This state of affairs is frequently taken to indicate that our understanding of the gold standard remains imperfect. But, in fact, our knowledge of the gold standard is considerably more complete than is typically assumed. Most of the elements needed to paint a complete picture are readily at hand. Completing the picture only requires that we blend the contributions of economic theorists and economic historians. Like the blind men with the elephant, students of the gold standard have derived their views from an awareness confined to individual parts of the beast. Theorists have restricted their attention to aspects of the adjustment mechanism. Only rarely have they been inspired in their theoretical enquiries by the insights of historical scholars. Historians have typically confined their attention to instances of the gold standard's operation. Only rarely have they attempted to generalize on the basis of their studies or been guided in their historical enquiries by the insights of economic theorists.

Interaction between these two sets of scholars and integration of these two literatures are precisely what is needed to generate fresh insights into how the gold standard worked. To demonstrate the 'intellectual gains from trade', the present volume brings together selections on the international gold standard from the literatures of history and economics. The book is directed at students of both economic history and international finance in the hope that their understanding of the gold standard will be enriched by exposure to the contributions of scholars in a related field.

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The three basic features of a gold standard regime are (i) interconvertibility

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between domestic money and gold at a fixed official price, (ii) freedom for private citizens to import and export gold, and (iii) a set of rules relating the quantity of money in circulation in a country to that country's gold stock. An international gold standard exists when a number of countries adhere to these principles. With each country willing to convert its domestic currency into a fixed weight of gold and with the price of gold set on world markets subject only to the margins covering shipping and insurance costs, an international gold standard establishes fixed exchange rates between national currencies. Balance-of-payments settlements are effected through international transfers of gold, and balance-of-payments equilibrium is obtained through the impact of gold flows on internal conditions.

The international gold standard is sometimes portrayed as the normal state of affairs prior to World War I. Yet a gold standard regime embodying the basic features listed above prevailed on a global scale only for a third of a century, from 1880 to 1914. At the end of the Napoleonic Wars, the currencies of the world were based with few exceptions on silver rather than gold. Britain was an important exception, having been on a full legal gold standard from 1821 and on a *de facto* gold standard from 1717, when Sir Isaac Newton, then Master of the Mint, set too high a silver price for the gold guinea. With the Mint price of silver lower than its international market price, Britain's newly minted full-bodied silver coins were quickly driven from circulation.<sup>2</sup>

During the Napoleonic Wars, Britain experienced a severe inflation which necessitated the suspension of convertibility. To prevent a recurrence of inflation, a law of 1819 required the Bank of England to make its notes redeemable in gold at the market price prevailing in May 1821.<sup>3</sup> This placed the Bank of England in a curious position, since it was still a private, profit-oriented institution, albeit one with special privileges and obligations as banker to the government. A quarter of a century later, the Bank Charter Act of 1844 sought to clarify the Bank's position, dividing the institution into an Issue Department vested with the responsibility of backing the note circulation with gold, and a Banking Department charged with the profit-making activities of the Bank and functioning as the vehicle for market intervention.

Until the 1880s only Britain maintained a full-fledged gold standard for any length of time. The United States and France remained officially on bimetallic standards. By law, each country offered to convert its currency into specified amounts of either gold or silver. In effect, each attempted to operate a commodity price stabilization scheme, using reserves of gold and silver as buffer stocks to stabilize the relative price of two metals. Their experiences illustrated the pitfalls of attempting to use small buffer stocks to stabilize prices in large markets. In the United States, the Mint ratio established by the Coinage Act of 1792 was 15 ounces of silver to an ounce of gold, which closely approximated the then prevailing market price. In the course of subsequent decades, a great increase in Mexican and South American silver production

caused the relative price of silver to gold to decline to approximately  $15\frac{1}{2}$  to 1. With gold undervalued at the Mint, silver was brought there for coinage and gold was shipped abroad where its price was higher (the opposite of the effect of Isaac Newton's undervaluation of silver – cf. p. 4). For much of the period 1792–1834, the US was effectively on a silver standard. The Coinage Act of 1834 changed the Mint ratio to approximately 16 to 1 in an attempt to bring gold coins back into circulation. But gold discoveries in Russia, Australia and California beginning in 1848 depressed the market price of gold relative to the 1834 Mint ratio. By 1851, a silver dollar was worth 104 cents on the open market. With silver now rarely used in transactions, the US was in effect on a gold standard until convertibility was suspended with the outbreak of the Civil War.

Over the first three-quarters of the nineteenth century, France experienced similar difficulties. Although the country was legally on a bimetallic standard from 1803, little gold circulated internally until the late 1840s since the Mint ratio of  $15\frac{1}{2}$  to 1 was lower than the market ratio. Once mid-century gold discoveries depressed the market price of gold, gold replaced silver in internal circulation.

From the beginning of the 1870s, a succession of countries adopted full-fledged gold standards. The first step in the erection of an international gold standard was taken by Germany in 1871. Although Germany had previously derived some advantage from its silver standard in trade with Eastern Europe, by 1870 most of that region had suspended convertibility. The indemnity Germany received in 1871–3 as victor in the Franco-Prussian War provided the resources needed to carry out a currency reform. A new gold-based currency unit, the mark, was adopted, and Germany used her indemnity to purchase gold on a substantial scale. With German gold purchases following silver discoveries in Nevada and other mining territories, bimetallic countries were faced with a precipitous decline in the relative price of silver. Their response was to suspend silver coinage and convertibility, starting with Holland, Denmark, Norway and Sweden, and spreading to France and the associated countries of the Latin Monetary Union (Belgium, Switzerland, Italy and Greece). Gold became the monetary standard in every European country except those which retained inconvertible paper. In 1879 the international gold standard reached across the Atlantic, when the United States ended the Greenback Period by restoring gold convertibility, and into Asia when Russia and Japan adopted convertibility. Austria-Hungary and Italy did not legally adopt gold convertibility but from the turn of the century pegged their currencies in terms of gold.<sup>4</sup>

There were important differences in the manner in which these countries adhered to the central features of the gold standard regime. One might differentiate countries by the extent to which gold coin circulated internally. Gold coin formed an important part of currency circulation only in England,

France, Germany, the United States, Russia (after 1879), Australia, South Africa and Egypt. One might distinguish countries on a full gold standard where convertibility was automatic (Britain, Germany and the US) from countries on a 'limping' gold standard where convertibility was at the authorities' option (France, Belgium and Switzerland).<sup>5</sup>

One might also differentiate countries according to their 'cover system', which linked the quantity of currency and coin in circulation to the country's gold reserve. There existed three main types of cover system: the fiduciary system, the proportional system, and a combination of the two. The fiduciary system allowed the authorities to create a certain quantity of unbacked currency (the fiduciary issue) while requiring remaining currency to be fully backed with gold. This was the cover system used by England, Finland, Japan, Norway and Russia. The proportional system treated all currency alike but permitted the central bank to maintain a ratio of gold to currency issue of less than 100 per cent. This was the mode of coverage used by Belgium, Holland and Switzerland. Cover systems which combined features of these two rules were adopted by Germany, Austria-Hungary, Italy and Sweden.<sup>6</sup> In some countries additional flexibility was built into the system by permitting the note issue to exceed the legal limit upon payment of a tax or by permitting reserves to fall below their legal minimum upon the Finance Minister's authorization. Although the central banks of Finland, Germany, Italy, Japan, Sweden and (in a sense) Britain did not have a monopoly of note issue in the final decades of the nineteenth century, in all of these countries the circulation of other bank notes was relatively small and declining.

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The appeal of the gold standard can be traced to the belief that it provides price and exchange-rate stability. The advantage of exchange-rate stability, as Gregory (1932) put it, is that international trade and investment can be conducted with minimal risk of capital losses due to exchange rate fluctuations. Of the fact that the classical gold standard provided exchange-rate stability there can be little dispute. Only a small number of countries were forced off the gold standard in the period 1880–1914. The major devaluations of the period were those of Portugal, Argentina, Italy, Chile, Bulgaria and Mexico. Exchange-rate stability did not extend to China, El Salvador or Honduras, which remained on silver and whose currencies therefore fluctuated in terms of gold, nor did it encompass Spain and the Latin American countries whose currencies remained inconvertible for extended periods. None the less, the extent of exchange-rate stability under the classical gold standard is impressive in comparison with the most recent decade.

Just as exchange-rate stability was said to promote mutually advantageous international transactions, so price-level stability was said to encourage domestic specialization and long-term planning. Since at least Ricardo (1816) it has been argued that the obligation to maintain convertibility provided a check on inflationary finance. By limiting the discretion of monetary authorities, gold standard discipline minimized the danger that the value of financial assets would be eroded by inflation. Even those such as Viner (1937) who remained sceptical that the gold standard would produce long-run price stability predicted that a system of inconvertible currencies would yield considerably worse results. They advanced this argument even while recognizing that the authorities retained a significant measure of discretion under a gold standard regime (a point taken up below).

Whether the gold standard's operation tended to stabilize prices over the longer term is a distinct question. Mill (1865) first described the mechanism through which this tendency could occur. His assumption was that the flow supply of newly mined gold should be responsive to relative prices. As the world economy expanded and the demand for money grew, downward pressure would be placed on the world price level. As the prices of other commodities fell in terms of the *numéraire* commodity gold, new supplies of gold should be elicited by its rising value. Another interpretation of this mechanism is that a falling price level reduces the costs of the gold-mining industry relative to the value of its product, causing additional resources to be devoted to mining and more output to be forthcoming. Similarly, to the extent that deflation causes the price of jewellery to fall in terms of gold coin, jewellery will be presented at the Mint for conversion into coin, increasing the quantity of coin in circulation and moderating the downward pressure on prices (see Barro, 1979).

In the nineteenth and twentieth centuries, fluctuations in world monetary gold reserves have been dominated by mining activity. Even Mill, who emphasized the stabilizing function of mining, recognized that time was required before a mining response would occur. Others emphasized the randomness of gold discoveries rather than their responsiveness to relative prices. Alfred Marshall (1923) for one was dubious that long-run price stability would be provided by a system dependent on the 'hazards of mining'.

Ultimately, these questions of price and income stability can only be settled on an empirical level. The problem is one of agreeing upon an appropriate basis for comparison. Disagreement starts with the years which are properly denoted those of the gold standard and on appropriate measures of stability. Typically, comparisons are made between the period 1880–1913 and that following World War II, although it is sometimes objected that the Bretton Woods System is properly viewed as a quasi-gold-standard regime.<sup>7</sup> Bordo (1981) has compared rates of inflation, unemployment and income growth in the two periods for the United Kingdom and the United States. The rate of

change of wholesale prices appears to have been more moderate under the gold standard than during more recent periods. In contrast, comparisons of per capita income growth and unemployment indicate that the gold standard had no obvious superiority over recent monetary arrangements; if anything, the opposite is true. Even the relatively low inflation rates of the classical gold standard era can be cast in a less favourable light, since they are the product of averaging together two decades of deflation prior to 1893 and two subsequent decades of inflation.

Some observers would argue that the variability of inflation and income growth rates (rather than the trend) provides a superior measure of stability. Such comparisons are appropriate if one takes the view that it is not inflation or deflation but their variability that interferes with decision-making. Similarly, it might be argued that the operation of the monetary standard has relatively little impact on average rates of income growth but important implications for the stability with which growth proceeds. Bordo (1981) computes various measures of inflation and income growth variability.<sup>8</sup> On the basis of his variability measures, it is difficult to determine the superiority of either monetary regime. For Britain, Bordo finds that the standard deviation of prices was somewhat lower under the gold standard regime; for the US it was slightly higher. In both countries, rates of real-income growth were more variable under the gold standard.

A related argument is that, rather than the total variation in prices and incomes, only the proportion of that variability that could not be predicted by market participants was relevant for economic welfare. Consider the predictability of prices. Had individuals been able to accurately predict prices under the gold standard regime, then they could adapt their behaviour to anticipated inflation or deflation without incurring the costs of prediction errors. The historian's problem is how to estimate the predictability of a time series. Cooper (1982) (reproduced, pp. 251–67) attempts to infer price predictions from *ex post* real interest rates. He finds that under the gold standard *ex post* real interest rates rose during deflationary periods and fell during inflationary periods as if individuals failed to anticipate changes in prices. A limitation of this approach is that no attempt is made to correct for other factors which may have caused shifts in *ex ante* real interest rates. Moreover, during the 1950s and 1960s interest rates also failed to adjust to changes in inflation, a tendency which is especially evident once tax effects are taken into account. Thus, on the basis of *ex post* real interest rates, few conclusions can be drawn concerning the superior predictability of prices under either monetary regime.

Another approach to evaluating price predictability under the alternative monetary regimes is to estimate forecasting equations for prices and to compare the mean squared errors of the forecasts. The advantage of this approach is that it considers prices directly rather than attempting to infer price forecasts from interest rates. Its disadvantage is that it is based on an 'as

if' assumption – namely, it requires the assumption that agents behaved as if they had knowledge of the forecasting equation. Moreover, the results of such exercises can always be questioned since there are innumerable forms which such an equation might take.<sup>9</sup>

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In the absence of any clear-cut superiority in terms of price or income stability, the outstanding feature of the classical gold standard appears to have been its association with exchange-rate stability. Those few exchange-rate adjustments which did occur were the result of balance-of-payments crises. The question therefore is why there were so few balance-of-payments crises during the period 1880–1913; in other words, why did the balance-of-payments adjustment process work so smoothly under the classical gold standard?

It could be argued that the successful maintenance of fixed exchange rates had little to do with the gold standard *per se*. Exchange-rate stability could have been nothing more than a reflection of the underlying stability of financial conditions. In fact, however, the period 1880–1913 was one of recurrent financial instability. Monetary disturbances associated with banking difficulties recurred in successive episodes centred on the years 1884, 1890, 1893, and 1907. These difficulties were transmitted internationally through capital flows and dealings in foreign exchange.<sup>10</sup> Thus, the instability of the underlying financial environment renders all the more remarkable the dearth of convertibility crises.

To understand the successful maintenance of fixed exchange rates in the decades before World War I, we must analyse the balance-of-payments adjustment mechanism under a gold standard regime. How the adjustment process worked prior to 1913 is 'the ritual question' posed by students of the gold standard (to adopt the phrase of de Cecco, 1974). A glance at the literature appears to reveal many competing models of the adjustment process. In competition with the price-specie-flow mechanism of Hume (1752) we have the spending approach of Whale (1937) (reproduced, pp. 49–61) and Ford (1962), the capital-flows approach described by Whale (1937) and Scammell (1965) (reproduced, pp. 103–19), and the monetary approach to balance-of-payments adjustment as emphasized by McCloskey and Zecher (1976) (reproduced, pp. 63–80). Superficially, there would appear to exist profound disagreement on the question of the adjustment process. But in fact the competing models of the adjustment mechanism are entirely compatible and need only to be combined to provide a reasonably complete picture of how the gold standard worked.

The classic model of gold standard adjustment is the price-specie-flow mechanism of David Hume (1752).<sup>11</sup> The simplest way to understand this

mechanism is in terms of a stylized model of a world economy in which two categories of commodities are traded. We will denote these categories consumer goods and gold. What then is the effect of a disturbance to this economy, say a one-time addition to the domestic stock of gold?<sup>12</sup> At the initial prices, increased gold holdings give rise to an excess supply of gold and an excess demand for consumer goods. Prices must adjust to restore equilibrium to both markets. The assumption upon which simple treatments of the price-specie-flow mechanism are based is that transactions occur initially among domestic residents. As residents simultaneously attempt to sell gold and acquire consumer goods, the price of consumer goods rises in terms of gold (equivalently, the domestic gold price falls). The price of consumer goods in terms of gold is now higher at home than abroad; equivalently, gold is more expensive abroad. Domestic residents have an incentive to obtain consumer goods from abroad where they are relatively inexpensive. Similarly, foreign residents have an incentive to obtain their gold from the domestic country, where its price is low in terms of consumer goods. Under the (admittedly artificial) assumption that these events occur sequentially, the effects of the gold discovery now begin to leak overseas. A surplus of consumer goods is shipped to the domestic country, and a surplus of gold is shipped to the foreign country. In the absence of adjustments on the production side (which are introduced below), foreign residents must reduce their spending on consumer goods to make a surplus available for export. Similarly, domestic residents must increase their spending relative to production to absorb a surplus of imports. Seen in terms of the external accounts, the home country runs a balance-of-payments deficit whose corollary is its loss of gold.

This detailed description of the price-specie-flow mechanism illustrates a basic point that is all too frequently overlooked or misunderstood. It demonstrates that disputes over whether balance-of-payments equilibrium is restored through 'adjustments in commodity markets', 'adjustments in gold markets', or 'adjustments in spending' are fundamentally misguided. Adjustments in commodity markets and adjustments in gold markets are two sides of the same coin. In a simple two-commodity model there exists only one relative price, so a rise in one commodity price is the same phenomenon as a fall in the other. In other words, when one market clears, so must the other, as a result of Walras's law. It is simply not meaningful to ask whether adjustment takes place in one market or the other, or to debate whether the gold market or other commodity markets were 'more important' in the adjustment mechanism.<sup>13</sup>

Hume was fully aware that his stylized account of the price-specie-flow mechanism was useful as an analytical exercise but not as a description of reality. Transactions do not generally occur sequentially, first within and then between national markets. International arbitrage in markets for both gold and consumer goods creates a powerful incentive for the maintenance of the



international 'law of one price'. McCloskey and Zecher (1976), following a long tradition, argue this point forcefully. Except for tariff barriers and international transport costs, they assert, there is no reason for prices to differ by wider margins internationally than among regions of a national economy. The incentives for arbitrage are the same within and between nations. But this recognition leaves the theorist in a quandary: once arbitrage creates a tendency for prices to be equated across markets, the balance-of-payments adjustment process can no longer operate through Humeian relative price effects.<sup>14</sup>

This is the challenge taken up in a series of investigations including the path-breaking work of Whale (1937). Whale questioned each aspect of the classical interpretation of how the gold standard worked, noting in particular that commodity price changes occurred so rapidly that few if any relative price movements could be observed during the adjustment process, and that the elimination of payments imbalances was conspicuously accompanied by interest-rate differentials and international capital flows. His response was to introduce a third market into the basic model of the adjustment process. Appending a financial market with international trade in assets to the simple two-sector model permitted him to analyse other channels through which adjustment might occur. In our stylized model, residents of both countries now hold stocks of consumer goods, gold and a single interest-bearing financial asset. What then is the effect in this more general model of a one-time addition to the domestic gold stock? It is useful to repeat our previous 'thought experiment', assuming initially that transactions take place first among domestic residents before introducing international arbitrage in the short run. (Nothing essential depends on what is only an expositional device.) The initial excess supply of gold has as its counterpart an excess demand for consumer goods and securities.<sup>15</sup> The domestic prices of consumer goods and securities rise; equivalently, the domestic gold price falls. Residents of the country where the gold discovery has taken place now have an incentive to obtain their consumer goods and securities from abroad where both are relatively inexpensive, while residents abroad have an incentive to obtain their gold from the domestic country. The domestic country's exports of gold equal in value its imports of consumer goods and securities. Thus, with trade in financial assets, the trade balance deficit no longer equals the gold outflow; rather, the balance-of-payments deficit equals the international transfer of gold. The payments deficit is the sum of the trade balance deficit and the capital outflow, where 'capital outflow' is another name for domestic purchases of foreign securities. It is irrelevant whether we describe this mechanism in terms of price or interest-rate effects, since security prices and securities' rates of return are inversely related. Saying that security prices are higher at home than abroad following the gold discovery is no different from saying that interest rates are lower at home than abroad. In this model capital flows from the country where