1-1-2006

'Financial Derivatives: The New Gold?

Michael Rafferty
University of Wollongong, rafferty@uow.edu.au

Dick Bryan
University of Sydney

Follow this and additional works at: <https://ro.uow.edu.au/gsbpapers>

Part of the [Business Commons](#)

Recommended Citation

Rafferty, Michael and Bryan, Dick: 'Financial Derivatives: The New Gold? 2006, 265-282.
<https://ro.uow.edu.au/gsbpapers/73>

'Financial Derivatives: The New Gold?

Abstract

For many economists, the current period of globalized finance lacks an apparent material anchor such as gold once was. This paper contends that in an important way the anchoring function is currently undertaken by financial derivatives. These contracts are not just about risk management and speculation. Critically also, they are commensurating the values of different financial assests, including different currencies.

Keywords

Financial, Derivatives, Gold

Disciplines

Business

Publication Details

Bryan, D. & Rafferty, M. (2006). "Financial Derivatives: The New Gold?. Competition and Change: the journal of global political economy, 10 (3), 265-282.

Financial Derivatives: The New Gold?

DICK BRYAN¹ and MICHAEL RAFFERTY²

¹*School of Economics and Political Science, University of Sydney, NSW 2006, Australia*

²*Graduate School of Business, University of Wollongong, NSW 2522, Australia*

For many economists, the current period of globalized finance lacks an apparent material anchor such as gold once was. This paper contends that in an important way the anchoring function is currently undertaken by financial derivatives. These contracts are not just about risk management and speculation. Critically also, they are commensurating the values of different financial assets, including different currencies. In so doing they can be seen to be imposing a competitive benchmark into the management of financial assets. Indeed, via this benchmarking, derivatives bring the management of labour to the fore in the stabilization of global financial markets, just as it was at the centre of adjustments under the Gold Standard in the nineteenth century. The paper explains this role of derivatives at the centre of contemporary global finance via a comparison with the way in which gold anchored the globalization of the late nineteenth century.

KEY WORDS Financial derivatives, Competition, Commensuration, Labour, Global finance, Globalization

Introduction

Debates about 'globalization' often engage the parallels between the expansion of trade, investment and finance in the late nineteenth and late twentieth centuries. From the late nineteenth century, the extensive international flow of finance, trade and investment was facilitated by its virtually unassailed role as the global monetary unit. Gold could be said to have anchored the global financial system. At the end of the twentieth century, there was also a surge in global flows of finance, trade and investment, but without the facilitation of gold, or any other globally-recognized single monetary unit.

In this current context, many would point to the role of the US dollar as the globally hegemonic national currency. But it has no formal status in global markets, as it did under the post-war Bretton Woods Agreement. Moreover, there is a pervasive need to convert between the US dollar and other currencies, and exchange rates and interest rates in relation to the US dollar have been anything but stable or predictable. The dollar may be dominant, but it cannot be considered an anchor in the same way that it was under the Bretton Woods Agreement, or as gold was under the Gold Standard. So the current era of 'globalization' is occurring, it seems, without a formal, universally-recognized monetary anchor.

The problem now manifests in the fact that financial asset prices, including exchange rates, have not gravitated to 'fundamental value' as the free market theorists predicted, and they have often not even come close. Empirical evidence has found no clear relationship

E-mail address: dickb@econ.usyd.edu.au

between prices and 'fundamental values' in the markets for financial assets. This evidence is critical, for it points inexorably towards the inability of floating exchange rates to constitute an anchor. Money, it seems, is not a 'veil', but exerts 'real' impacts in markets and on accumulation generally.

This paper develops the argument that the system of myriad financial derivative contracts is playing the role of a monetary anchor – not a rigid, fixed anchor like gold, but a flexible, floating anchor that reconciles so-called 'real' and 'monetary' phenomena. In this regard, we show that derivatives perform two important functions: binding (commensurating prices in one place or time period with those in another), and blending (permitting attributes of one type of asset or liability with those of another to be exchanged). Through these functions derivatives help to establish the relative values of a vast range of financial assets, including currency values. But, we argue, more than just relative values, derivatives provide a means to base asset values, including money, in capital accumulation.

It is in this sense that derivatives can be seen to provide an anchoring process, albeit one of a possibly fragile kind. They do not replace the hegemony of the US dollar (just as the Gold Standard could stand alongside the hegemony of the British pound); on the contrary, they facilitate the reproduction of a global financial system in which the dollar's role is not absolute. Further, this anchoring role of derivatives has little to do directly with formal or informal state-level agreements. It is to be seen as the consequence of a fiercely competitive process of valuation in globally-integrated financial markets: a process in which the role of labour can be revealed as central.

In developing this argument we first pose the question in greater detail, via a simple comparison with the Gold Standard of the late nineteenth century so as to highlight the way in which derivatives can be understood in a monetary role, rather than simply within a discourse of 'risk management'.

The following section turns to the anchoring question in the post-1970s period. It reviews the neo-classical argument that deregulated foreign exchange markets would gravitate towards stability without the need for a formal anchor, and the historical evidence to the contrary. This then opens up the role of derivatives.

The argument for free markets rested on the proposition that asset prices would systematically gravitate towards 'fundamental value'. The fact that they have not so gravitated opened the need for derivatives to compensate (as it were) for the failure. The effect of derivatives is not to move financial markets towards 'fundamental value', but to commensurate the value of all financial assets, including currencies. This commensuration process imposes a competitive pressure into financial markets, in which there is a direct reliance on labour market flexibility to deliver competitive rates of return and so support competitive asset valuations. The final section identifies the project of making labour flexible in supporting global financial stability in the current era and under the Gold Standard.

The Problem Posed – Derivatives and the Analogue With Gold

The huge growth in international transactions in the late nineteenth century occurred with a stable global currency and hence rigid exchange rates between nations: the classical Gold Standard. Significantly, this stability in exchange rates came not because nation states actively managed currency values (there were virtually no central banks as such), but because the state's role was restricted merely to the provision of a dependable physical

currency.¹ On this basis, nations used gold as their currency base and trade imbalances between nations could be settled in gold transfers.² Indeed, the need for convertibility of national money units into gold ensured that nation states would not meddle with money too much for fear of creating domestic price instability.

In the current era, there is no such global unit. Instead, nationally-designated currencies are the only currency in global circulation. (We will call them nationally-designated currencies rather than simply national currencies because their extra-national circulation, which de-links the direct association between spatial circulation of national currencies and national territory, is precisely the point at issue.) These nationally-designated currencies are being expected to play both national roles (and therefore be responsive to national monetary policy) and global roles too.

There are ongoing contradictions when currencies are asked to play this dual role. This was seen emphatically in the post-Second World War period (the Bretton Woods Agreement) where the US dollar was required to play both a domestic role within the United States and a global role as the pre-eminent vehicle currency (as this extra-national role is now called). While there remains debate about the causes of decline of the Bretton Woods Agreement at the beginning of the 1970s, this contradiction is at the centre of most such explanations.

Most, if not all, nationally-designated monies are now playing some vehicle currency role – they are being used in roles such as holding assets and issuing bonds – in ways that may have no necessary connection to the nation of designation. The contradictions that became so stark in the 1960s in relation to the US dollar now apply, to some degree, to other currencies too. As Benjamin Cohen (1998: 5) observed:

Less and less is money's imaginary landscape accurately represented by the outdated myth of One Nation/One Money. . . . Today, monetary geography is best understood in functional rather than physical terms – currency spaces that are flow-based rather than bound to place.

Furthermore, capital flows are no longer a minor form of international transaction, simply facilitating national current account adjustment. They are large in scale and playing a determining role in the prices for national currencies. In 1975, for instance, cross-border transactions in bonds and equities was still only 4 per cent of US GDP. In the early 1990s it had reached 100 per cent of GDP. By the early 2000s it had exceeded 245 per cent of GDP (Siourounis 2004). The combined effect of these sorts of developments is that nationally-designated currencies are not subject to state regulation in the way that they would be in a closed economy, or were under the Bretton Woods Agreement. This is not to say that national central banks no longer take responsibility for the integrity of nationally-designated currencies. Inflation policy, interest rate targeting and (broad) management of the exchange rate remain policy concerns and objects of central bank market interventions. But national central banks have little or no jurisdiction over the vehicle currency roles of nationally-designated money, so their regulation can only be partial. Exchange rates remain volatile, and it is outside the capacity or intent of national central bank policy to eradicate this volatility. In such a situation, the nation state does not and cannot anchor the global financial system, individually or collectively.

Exchange rate instability that emerged in the 1970s, and has become an accepted part of global finance, therefore highlights our problem: if gold no longer anchors the global financial system (the Gold Standard), and nation state regulations (capital controls, fixed

exchange rates, the Bretton Woods Agreement) no longer anchor the global financial system, what does?

In the absence of gold and state guarantees, but on-going volatility in exchange rates, the most conspicuous response from nation states was the formation of institutional arrangements to bring organized stability to exchange rates – such as via the Plaza Agreement and Louvre Accord or various national financial ministerial summits. Such interventions could only be stopgap measures. They sought to bring fixity to financial transactions that were already of a scale and range beyond the capacity of nation states, even the most powerful, both individually and in combination, to control. The short-term impact of these decrees is, in retrospect at least, hardly surprising.

Concurrently, products emerged (financial derivatives) to deliver what pure exchange processes and international state decrees could not. By providing a means to compare the value of (commensurate) different sorts of financial assets in highly liquid markets, derivatives came to provide a measure of a value of capital against which all different forms of capital, including national currencies, could be benchmarked. There is some sort of an anchoring role here but it is not a fixed anchor like gold under the Gold Standard, or the US dollar and gold under Bretton Woods.

This process of commensuration that comes with derivatives can be thought of as a network of anchors. Each derivatives contract embodies a specific (but ongoing) process of commensuration between particular forms (or attributes) of capital across time and space. Collectively, however, *as a system of derivatives*, they permit the commensuration of all capital.

An analogy with the measurement of time and space can help conceptualize this notion. In the nineteenth century, time and space was measured at a fixed point – Greenwich – and all other positions in the globe determined their time and location by reference to Greenwich. In the twenty-first century, location and time at different locations is measured not by reference to a fixed point, but by global positioning system (GPS) technology, in which multiple satellites circling above the planet permit the triangulation by several satellites, which can then be used to compute relative positions and thereby specify individual positions. These satellites can be thought of as a new, floating anchor for space/time measurement. While gold and Greenwich were the respective fixed point anchors of an earlier period, GPS and financial derivatives are the respective floating anchors of today. Like GPS satellites, derivatives make up multiple (indeed thousands of) different means to 'compute' the relative values of a vast range of different financial assets, including currencies, and thereby specify the value of each of them. While they seem to float above real economic processes, it is this very abstract capacity that permits them to act in their role of anchoring in a way suited to the demands of modern economic processes.

Our object, therefore, is to explain how derivatives can be understood as playing the role of 'computing' relative values and how this provides a current anchoring function for capital. We develop this via an exploration of the need for a new monetary anchor after the end of the Bretton Woods Agreement.

Floating Rates Since the 1970s

With the end of the Bretton Woods Agreement and fixed exchange rates, there evolved a period of high capital mobility and floating exchange rates. But under the current system of

floating exchange rates there is no anchor to the global monetary system. There is supposedly no link to commodities at all. Barry Eichengreen and Nathan Sussman (2000: 36), for instance, conclude that:

The collapse of Bretton Woods loosened the exchange rate constraint and cut the last remaining link to commodity money. It removed the traditional anchor for monetary and fiscal policies.

If gold ceases to be an anchor either directly as under the Gold Standard, or indirectly as under the Bretton Woods Agreement, what anchors the system in the post-Bretton Woods era?

The conventional answer, given by conventional economists, is that exchange rates do not need an anchor: free markets are all that is required. That was certainly the view of a generation of international monetary economists who advocated exchange rates in the name of flexibility and market efficiency. Harry Johnson (1969: 208) probably the leading international monetary theorist of the 1960s and 1970s, was emphatic:

A freely flexible exchange rate would tend to remain constant so long as underlying economic conditions (including government policies) remain constant; random deviations from the equilibrium level would be limited by the activities of private speculators.

It was on this sort of assurance (and, it must also be said, a lack of alternatives) that state policies from the late 1970s gravitated towards free-floating exchange rates. Moreover, the assurances and the policy change itself were introduced without so much as a concern for the anchor question. However, we will see, within this conventional economics, that there is a *conceptual* anchor, albeit one that has failed to deliver stability.

The Floating Rate Orthodoxy

The argument for floating exchange rates has a long history: it is but one particular facet of a wider argument for *laissez faire*. Indeed, central to this line of analysis is an argument that exchange rates will be determined in the same way as any financial asset. Its particular application to finance, and especially foreign exchange markets, can be associated with three complementary 'theories' that themselves have long lineages, but were prevalent in the post-Second World War arguments for floating rates and for liberalized capital markets generally.

One theory is the Efficient Markets Hypothesis (EMH). This theory treats information as the key element in financial pricing and considers markets as information processing institutions. It contends that, in 'efficient' markets, prices will reflect all relevant information and quickly adapt to the arrival of new information. EMH contends that in such efficient markets investors cannot make above average returns in the long run on the basis of any generally available information. The implication then is that if above-average profits cannot be made by trading, prices must approximate their fundamental values.

Another such theory, which applies specifically to the foreign exchange market, was Purchasing Power Parity (PPP). PPP contends that, under conditions of perfectly competitive markets, exchange rates will adjust to ensure that prices for commodities and assets adjusted for exchange rates will be globally equal. We now popularly associate this notion with 'The Big Mac Index', published annually by *The Economist*, which measures whether the monetary value of a Big Mac in one country, when converted into the currency of a second country, will be equal to the price of a Big Mac in that second country. Economists

believed that, with reservations about distortions by governments and transport costs, exchange rates would gravitate to PPP. The effect would be that the purchasing power of money would be consistent across currencies, and would be a direct reflection of relative national costs of production.

The third theory was of great ideological significance in the context of financial volatility in the 1970s. It was the argument presented in 1953 by Milton Friedman that speculation exerts a positive impact on exchange rate determination by bringing markets more rapidly to equilibrium. Friedman (1953) contended that if a market price moves away from its 'fundamental' value, then speculators will act to bring it back. Successful speculators will be those who know the 'real' value of a financial asset, and position themselves in the market accordingly: they will sell when the price is above fundamental value, pushing the price down, and buy when it is below, pushing the price up. Speculators who do not know the fundamental value and 'bet' the wrong way will make losses and, if this continues, will go out of business.³

The fact that the argument was authored by Friedman, the then-guru of monetary economics, was significant in itself, but, just as important, it was a comforting argument for policy makers in the 1970s who saw speculation emerging alongside capital mobility. While 'Keynesian' economics may have been coming into disrepute in the context of 1970s stagflation, Keynes' warnings about the dangers of speculative capital flight were being played out as real national policy challenges. Friedman's was an argument that allayed the fears about speculators.

Of themselves, these three theories are merely specific applications of general propositions of laissez faire economics. But they were not simply advocating the virtue of market determination as a means for exchange rate stability: there was supposedly another virtue as well. In gravitating to both efficiency in resource allocation and a stable equilibrium, it was argued also that markets would gravitate towards 'fundamental value' or, as they are now referred to, 'the fundamentals'. (One frequently hears the term in financial media that an exchange rate or share price is or is not reflecting 'fundamentals'.)

What exactly does this term mean? While 'normal' goods and services will be valued by the market according to how much 'utility' they give an individual (a purely subjective calculus), financial assets are not desired because of their intrinsic utility: they are held because of expectation of their appreciation in price and capacity for income generation. The value of a share, for example, lies in a computation of the capitalized value of the expected performance of a company; an exchange rate of a country is supposed to reflect a measure of the performance of the national economy – its growth performance, its trade performance, its productivity growth, and so forth.

Perhaps, it might be thought, there is a subjective element here: each individual will have a different interpretation of what constitutes current performance, growth potential, etc. But, with the EMH and rational speculation central in the armoury, these issues of interpretation were precluded, and, in any case, expected to diminish as markets became more mature. Rational traders, with access to the same information, would reach the same valuation of a financial asset, and that valuation would be a correct estimation of its income-generating capacity.

So it was that the financial market policy makers confidently faced the new world of floating exchange rates, with the belief that market-driven exchange rates would be morally superior (free of state distortion), economically superior (gravitating to efficiency and equilibrium) and 'accountingly' superior (reflecting fundamental values).

'Fundamental value', then, was the notion of an 'anchor' in global financial markets that lay at the base of the neo-classical argument for floating exchange rates in the 1970s. And as a general proposition, it was directly consistent with the other arm of neo-classical monetary theory of the time: monetarism. Monetarism argued that money is a veil. The (so-called) 'real' economy of goods and services is what matters, and active monetary policy that uses money to manipulate real aggregates will only affect price levels. With exchange rates, the argument was parallel: they are prices that should reflect 'real' economic aggregates – the fundamentals – and if states stop distorting markets in pursuit of policy agendas, they *will* reflect the fundamentals. The anchoring role of 'fundamentals' then needs no government action: indeed it is corrupted by government action. This was the same as the argument for gold's role in financial stability.

Evidence of 'The Fundamentals': Asset Pricing and Exchange Rate Theories

Theories of asset pricing confront directly the question of whether prices reflect 'real', 'fundamental' values. In general, asset-pricing theories have been advanced in two broad directions. One approach seeks to determine whether asset prices reflect the capitalized value of future earnings (Donaldson & Kamstra 1996; Gordon 1962; Kamstra 2001). This approach seeks to establish asset prices directly on the basis of 'fundamental' values.

The other approach to asset pricing is the EMH discussed above. While the EMH is not formally an asset-pricing model, its link to asset pricing is two-fold. First, it is implicit in the model that efficient prices reflect fundamental value⁴ and, second, when asset prices diverge from fundamentals, it predicts that arbitrage (or what Friedman referred to as rational speculation) will act to pull prices back to fundamentals.

In the 1960s and 1970s, the notion that economic fundamentals drive prices, and that prices in turn reflect all available information, seemed increasingly secure as economic doctrine. By the late 1970s, a prominent finance theorist was even moved to conclude that no other proposition in economics was supported by such solid empirical evidence as the EMH (Jensen 1978). But this confidence has proven to be quite illusory. Both the Gordon model of fundamental valuation and the notion that markets accurately reflect all available information have been undermined by developments in actual market behaviour over the last 30 years.

Two developments serve to highlight this challenge to fundamental notions of asset prices and any economic notion of efficiency. The first is the growth in the volatility of asset prices (Edey & Hyvbig 1995). More disturbingly still, the pattern of this volatility has been found to be incompatible with any meaningful understanding of fundamentals (Hodrick 1990; LeRoy & Porter 1981; Malkiel & Xu 1997; Shiller 1981).

The second empirical observation is that asset prices may be misaligned for extended periods even in highly liquid markets (Haugen 1996; Schleifer & Summers 1990; Summers 1986), and that stabilizing speculators may not always be able to act to bring prices toward their 'fundamentals' (Pontiff 1997; Shleifer & Vishny 1997).

The evidence that asset prices have been more volatile than could be justified by any fundamentals (Shiller 1989), and that they may diverge from fundamentals for long periods, has been damaging to the theoretical integrity and coherence of finance theory (Haugen 1996; Schleifer & Summers 1990; Summers 1986). And the fact that asset prices have been found to deviate from fundamentals has also been a challenge to which financial theory has devoted much time. The issue remains ongoing.

But perhaps more corrosive still has been the evidence that theories of the international determination of currency prices (exchange rates) have also been undermined by the behaviour of foreign exchange markets. In other words, the relative price of the asset money, that is used to measure all other asset prices, has been no more linked to fundamentals than have other asset prices.

Floating exchange rates were expected to encourage real exchange rates to move toward some sustainable fundamental level (Obstfeld 1985; Williamson 1983). But exchange rates have also proven to be quite unstable⁵ and appear to move away from anything like fundamental prices for extended periods.⁶ Obstfeld and Rogoff (1995: 73) recall the disappointment at the actual experience with floating rates, and its effect on exchange rate economics:

When the postwar system of fixed exchange rates collapsed in the early '70s, few imagined just how volatile currency values would be in the ensuing floating rate era. Fewer still anticipated how difficult it would be to divine any systematic connection between exchange-rate movements and underlying changes in economic fundamentals, even at fairly long horizons.

By the early 1980s, Meese and Rogoff (1983) reported that, during the floating rate period, no model of exchange rate determination had any better predictive power than a random model. They were not even very good at explaining movements after the fact. Beechey *et al.* (2000: 19) summarize the findings of two decades of foreign exchange rate theory:

Floating exchange rates are quite volatile, with two-year movements of about 10 to 15 percent. Economic fundamentals, however, explain almost none of these movements. . . . No-one has yet been able to uncover economic fundamentals that can explain more than a modest fraction of year-to-year changes in exchange rates.

In summary, a problem of profound proportions has emerged: if monetary values do not closely correspond to 'real' production values, there are no clear guidelines for the prices at which financial (and non-financial) assets will trade. Neo-classical economists (and many post-Keynesians too) may construct behavioural stories of 'irrational agents' or 'rational bubbles' (for example, Blanchard & Watson 1982; Flood & Garber 1980; Meese 1986) to explain the non-correspondence and defend the explanatory power of their theories, but they provide little or no guide to actual pricing decisions that are taken in the market place, nor increasingly for the practice of monetary policy.

Accordingly, with no mechanisms to ensure a stable monetary unit on a global scale (stable exchange rates reflecting long-term 'fundamentals'), it cannot be said that 'floating exchange rates' replaced the need for an anchor to global money.

Nor, as it turns out, is it necessary. The failure of the ideological alternative (that markets would reflect fundamental values if 'deregulated' to be free from government intervention) was not itself a crisis for capital. While scholars debated the underlying logic of financial markets, and ruminated on the non-adherence to 'fundamental value', the traders themselves kept trading, and at a rapidly growing rate. There was (and is) nothing unsettling about the contestability of value, except for adherents to mechanistic theories of value. In the market place, capital itself developed means to hedge against monetary instability and provide mechanisms for price certainty in international financial markets: they developed financial derivatives.

Friedman's theory was right, but for the wrong reason – the market has produced a degree of global monetary cohesion not because 'deregulated' exchange rates are stable and

move rapidly to reflect 'fundamentals', but because the market has found it profitable to produce products to compensate (as it were) for the fact that they *don't* systematically reflect 'fundamentals'.

The Role of Regulatory Agencies: A Note

The development of globally-integrated financial markets from the 1970s challenged the capacities of national prudential regulations, financial stability policy and competition policies, leaving something of an institutional void. Moreover, the *laissez faire* discourse that drove policy changes was itself inclined to ignore the institutional and political structures within which financial markets operate.

But of course institutions do matter. The current international financial system, just like the Bretton Woods system and the international Gold Standard before it, is linked to and conditioned by wider geo-political processes and institutions. The 1970s and beyond thereby also appears as a period of extra-ordinary institutional reform in the context of global finance. But institutional arrangements alone in the post-1970s period could not secure global financial stability, nor were they designed to establish a new monetary anchor. Neither national nor international institutions exercise the sort of control over exchange rates that was provided under the fixed exchange rate system of Bretton Woods.

On a national scale, there have been ongoing calls for a focus on curtailing current account and public fiscal deficits, and market-friendly policies to increase productivity growth and the share of national income going to profits. Internationally, collective attempts by the concerted actions of several advanced nations (such as the Plaza and Louvre Accords, meetings of the G7, etc.) have at best provided temporary stabilizing effects.

There is no doubt, however, that international institutions have been critical in maintaining the operation of global financial markets, and minimizing the likelihood of widespread volatility and crises. Some even refer to the emergence of a new regulatory regime called Bretton Woods II, focusing on the role of national and international institutions in providing a governance role analogous to that provided under the Bretton Woods regime. This view was presented by the IMF's Michael Camdessus (1996) in the mid-1990s, and has been developed more thoroughly in the last few years by Dooley *et al.* (2003, 2004).

Yet for all the regulatory frameworks provided by such institutional arrangements, the scale of financial derivative transactions has kept growing exponentially. For some (for example, Strange 1986), this derivative growth is itself the source of the regulatory problem – derivatives are both spatially elusive and outside systems of conventional corporate and national accounting (Li Puma & Lee (2004).

But there is another side to derivatives that precluded them being targeted simply as the source of the problem. Institutions themselves do not provide financial anchors unless they actually fix prices by decree. Where financial prices are market determined, institutions provide context and frameworks, but by definition they do not establish anchors *per se*. To target the anchoring role, therefore, we need not juxtaposition between markets and institutions, but an understanding of international institutions as providing a framework within which derivative markets operate,⁷ and the institutions of the derivative markets as themselves providing systems of regulation.⁸

While a new form of market-based anchoring stands in contrast to the Bretton Woods era, it does have parallels with the nineteenth century. As Eichengreen and Sussman (2000: 38) conclude:

There are reasons for thinking that a century of dirigisme, which looks increasingly like an aberration in the long sweep of history, may be drawing to a close. Markets, by regaining the upper hand in determining exchange rates and capital flows, will only then have restored the status quo ante that prevailed for most of the last millennium.

Derivatives Anchoring the Global Financial System

Without supra-national or state guarantees or a single commodity base, the current foundation of the global value of money must be found in mechanisms generated by the global markets.

These mechanisms are financial derivatives. Insignificant before the late 1970s, financial derivatives shot to prominence in the 1980s and have kept growing since. Foreign exchange derivatives now have a daily turnover of around \$US1.8 trillion per day. These involve foreign exchange futures, options and especially swaps.⁹

Derivatives are usually framed in terms of risk management, as tools of corporate asset management, or as tools of speculation. But in the context of the anchor question, there is a need for a different framework to understand derivatives – one that focuses on the role of an aggregate *system of derivatives*, rather than on the micro questions of individual risk transfer. In this alternative framing, derivatives can be seen to play two related roles in financial market commensuration:

- Binding: derivatives, through options and futures, establish pricing relationships that 'bind' the future to the present or one place to another.
- Blending: derivatives, especially through swaps, establish pricing relationships that readily convert between ('commensurate') different forms of asset.

In the binding role, derivatives compensate somewhat for the absence of stability. While current prices may be volatile, futures and options contracts permit the 'locking in' of future prices – indeed they permit degrees of locking in according to desired levels of certainty and flexibility. This binding role is well established in the risk-centred derivative literature. It has been established that, where a derivative market exists for an asset or commodity, it typically plays a central role in determining spot prices. However, contrary to the presumptions of the neo-classical economic discourse, the binding role does not, of itself, draw prices towards 'fundamentals', it merely adds empirical stability, and permits transactions to occur 'as if' exchange rates were stable over short periods.

It is the blending role that most significantly creates an anchor for global finance, for it engages a material basis in financial transactions. In the blending function derivatives take the attributes of a range of different asset types and put them together in a separate product. To date, this blending role (and its implications) has been barely recognised in the financial derivatives literature. But the IMF's Conrad Vrolijk has observed that with financial derivatives the ability to substitute asset types has increased dramatically: 'derivatives make international asset substitution relatively simple' (1997: 10).

This is a critical perspective: if asset substitution is simple, it is a sign that assets can readily be measured in terms of each other. Derivatives present a rate of conversion of one 'bit' of capital (whether it be money or commodity and whatever its currency denomination and time specification) into another. This means that currency values are being measured not simply in relation to other currency values, but in relation to the values of all other forms

of financial assets. Herein lies the capacity for anchoring currency values within wider capital valuation, for each currency is being commensurated with iron ore prices, stock market indices and various future interest rates as readily as it is being commensurated with other currency values.

In the conventional neo-classical finance literature, links between asset types are framed almost entirely in terms of risk transfer. It is a risk transfer, but this blending role is also a process of asset commensuration. The case of a convertible bond, a rather basic derivative product, can be used to illustrate the process. A convertible bond is a bond with an 'embedded' option to convert to a share. It gives the owner a security with debt-like characteristics, but with the right to convert to a share if the share is performing better than the debt. Notice how the derivative element serves to intensify price relations of one form of capital (corporate debt) relative to another form of capital (equity): the convertible bond breaks down the age-old difference between debt and equity (and, indeed, money and ownership) and blends the two categories together.

There are thousands of other derivative products, often more complex in their structure than convertible bonds, which blend other asset characteristics. The effect of these in aggregate, as a system of derivatives, is to make any financial asset, in any form, and across time and space, commensurable with any other asset in any form at any place and over time: their relative values can be measured on an ongoing basis. While managing volatility may be the immediate cause of derivative growth, it is this process of commensuration which gives financial derivatives a distinctive money role within capitalism.

In this blending role, derivatives do not move prices to stable equilibria – they are not an alternative means of establishing the so-called 'fundamentals' of global purchasing power parity or interest rate parity. Indeed they are predicated on the notion that there are no 'fundamentals' – all asset values have particular temporal and spatial determination, and prices are forever changing, and in unsystematic ways. It is not possible to reduce one locality to another, one time period to another or one form of capital to another; but their values can be, and are, mediated on a daily basis.

But does this mean that financial markets have now to be understood as a set of relative prices based not on fundamentals, but on 'trader perceptions'? That would be a feasible direction of interpretation, and indeed it feeds directly into the interpretation of derivative markets as sites of speculation. It would also be a limited direction, and fail to address our initial question of the anchors for global finance.

The key to the anchoring role is that derivatives have transformed the way that the commensuration process occurs. Each derivative product is a package of conversion of one form of capital to another – whether this be a simple commodity futures contract or a complex conversion of a particular currency index to a particular stock market index. When all these products are taken together, they form a complex web of conversions, in which any 'bit' of capital, anywhere and with any time profile, can be measured against any other 'bit' of capital. They are not therefore a fixed single anchor (such as gold was), but a flexible series of many small 'floating' anchors.

But derivatives do not float randomly, for the binding and blending functions of derivatives are not just passive reflections of asset prices but active drivers of asset values. This is what makes them basically different from just inter-temporal floating exchange rates and raises them above being labelled as mere speculation. While the neo-classical floating rates are supposed to spontaneously *reflect* fundamental values (with money playing a neutral, passive role), derivatives actually serve to *determine* 'values' because of the competitive

pressure they place on the managers of assets to re-structure and re-configure so as to deliver a rate of return (and hence 'value') demanded by the market.

It is in this sense that derivatives express a material anchor to finance. To reiterate, derivatives do not provide a path to neo-classical fundamental value as a pre-existing 'target' and they have nothing to do with the establishment of equilibrium values. Both of these must be seen as theoretically contrived, fictional benchmarks that have no presence in actually-operating financial markets. Derivatives involve the contingency of value and the fact that value is formed in competition – it is not that competition is the path to reveal (pre-existing) value.

Derivatives, Labour and Nations

In the anchor question, we find a direct connection between derivatives and labour market flexibility as the foundation to financial stability, similar to the connection that applied under the Gold Standard.

Under the Gold Standard, high levels of international capital mobility – in some terms proportionately even higher than they are today – were directly compatible with stable exchange rates (and hence a stable global financial system) because national economic policy subordinated domestic agendas to the stability of the national monetary unit *vis à vis* gold. For the Gold Standard, labour was the swing mechanism of national economic adjustment, utilized to secure global financial stability.

As Eichengreen (1998) emphasizes, in the major trading and capital exporting countries, there was simply no significant political aspiration or institutional basis for using state policy to pursue social agendas that might result in price instability.¹⁰ Labour did not have the vote, union membership was low, unemployment was not an issue for states and the state ran minimal social and military expenditure. Moreover, with capital internationally mobile, labour was treated politically as the one component of production costs that was largely national.¹¹ Wages, employment rates and working-class living standards were made flexible on a national scale, and were readily changed to ensure domestic price and hence exchange rate stability. The Gold Standard was, therefore, not compatible with the rise of the labour movement, and its demands for social expenditure and policies to avert unemployment (De Cecco 1974) – a reality that became stark with the growing social expectations of state expenditure after the Second World War.¹² Once labour ceased to be a swing mechanism of macroeconomic adjustment, gold ceased to be a stable anchor.

How does this connection to labour play itself out in the context of derivatives? If all assets can be measured relative to the market, all corporations are perpetually aware of how each of their assets is performing. Assets under-performing relative to the market will be 'restructured' to lift their performance (which could mean being revalued, sold or made more profitable). Derivatives, therefore, do not simply reflect the performance of financial assets, they drive asset management behaviours that are designed to adjust the performance of financial assets to adhere to competitive norms.¹³

Concretely, the managers of capital cannot exert an impact on the pricing of most assets for markets do, in their own clumsy ways, make these determinations with some eye to future value. But these managers can exert influence over the income-generating capacity of some assets: those that involve the production of goods and services. Accordingly, a focus on labour emerges, for labour – its wage relative to its productivity – is the one area where

capital exerts individual discretion in the determination of asset performance and hence asset values.

Derivatives, like gold, can only play an anchoring role so long as labour's remuneration (relative to profits) is flexible. Under the Gold Standard, this flexibility was inbuilt – it followed directly from the impacts of cross-national gold movements on the domestic level of prices. In the current era, labour market flexibility is not so inbuilt: it has required a concerted effort on the part of capital and nation states to impose flexibility on labour so that labour's remuneration is more directly proportional to its contribution to profits (and hence asset values) on a corporate and workplace rather than national level of calculation. To promote global financial stability it has been imperative to break class consciousness, in a process that can be depicted as 'neo-liberalism'.¹⁴

But this process of reasserting labour as the swing mechanism of adjustment can no longer be a nationally-conceived process. In the nineteenth century trade, investment and finance were largely structured via the imperial system. International finance could be understood as a transaction between nations, both because of the nationality implicit within the imperial system, and because domestic market flexibility meant that prices could indeed adjust to secure national parity with gold. Gold, as a single anchor, could adequately mediate international financial transactions.

But, in the twenty-first century, transactions are very different, and much less reducible to relations between nations. The now-familiar rise of transnational corporations and commodity supply chains, and access to global financial markets for raising investment funds are all the hallmarks that capital's economic circumstances cannot be equated with those of any single nation (Bryan 2001). This need not reduce to an argument of complete detachment of capital from particular national territories or nation states, but, for larger capitals with exposure to multiple currencies (through costs or revenues) and wages in multiple countries, their interests are not reducible to the interests of individual nations. Each capital's multiple and complex global exposure requires that management of its financial stability be individually honed and calculated. An international gold standard, securing stability of national currencies via national policies, is not attuned to this complexity. Today, capital needs not a single anchor, but a web of anchors provided by financial derivatives to mediate diverse connections across asset types, currencies and temporal exposures.¹⁵

Similarly, capital's need of labour flexibility is not *national* wage flexibility (as the Gold Standard required and secured) but *individual workplace* (even individual worker) flexibility. Within any nation, different corporations have different exposures to local wage changes, and face different consequences of such changes: there are differing impacts on global profitability. Accordingly, movements in wages on a national scale are an insufficiently precise adjustment for individual corporations. Different corporations have different needs of their labour contracts, and they thereby seek to draw wage determination away from criteria such as labours' 'needs' and living standards and towards conditions of profitability. In many cases, this is the demand by capital to reduce wages (or increase productivity relative to wages); but in some cases it may be a demand by capital to increase wages to attract more workers into profitable activities. The key is flexibility in both wages and conditions, as capital seeks to compute labour costs as it does all other costs.

The effect of derivatives is to intensify this computation, as they permit corporations to identify on a real-time basis (not just via annual profit and loss statements) the market perception of the profitability of each of their assets. This impact is being felt not just by transnational corporations that directly experience the multiple and complex exposures of

participating in global markets, but all firms, small as well as large, producers of non-tradables as well as tradables. All corporate assets that are funded by borrowing from financial institutions, for example, are subject (indirectly if not directly) to the pressure to deliver internationally competitive rates of return.

Derivatives in their binding role are themselves but a short-term protection against the impacts of trends in profitability; but through their blending role they also provide precise information on pressures for organizational changes to secure profitability. It is the success of these pressures that ultimately stabilizes asset prices and consequently anchors financial stability.

Conclusion

There are many monetary histories of the last 100 plus years that depict a shift from commodity money of the Gold Standard, through the post-war Bretton Woods Agreement in which the backing of gold was mostly symbolic, to the current system of deregulated global markets and free capital mobility. Our objective here has not been to retell or actively debate that history, interesting as it is (Cooper 1982; McKinnon 1993; Solomon 1982). It has been to develop the argument that the world has not shifted steadily away from any anchor to the global financial system, as is commonly argued, but that it has moved towards a new anchor to global money: financial derivatives.

In the last 25 years, derivatives have moved imperceptibly to a central role in the global financial system. This movement has not been a conscious policy of nation states or a global regulatory authority; it has been a movement created within the market; by capital for capital. It has emerged as a logical necessity in the context of inherently volatile exchange rates, and the incapacity of the global financial system to guarantee the value of money as it moves between differently nationally-designated currencies. But further, it has become a means by which not just the immediate price but also the relative 'performance' of financial assets are compared. As such, derivatives have to be seen not just through the lense of 'risk management' but as tools for the ongoing calculation of asset values. Moreover, the assets whose values have most readily been calculated via derivatives are the values of different forms of money – different exchange rates, and different interest rate 'packages'.

Derivatives, therefore, have come to merge two functions. First, they bridge discontinuities in the international money system by, at least for a period, providing continuity and predictability in rates of conversion between different money forms. In this respect, derivatives perhaps have to be seen as themselves a form of money, providing a store of value and standard of deferred payment to the global financial system, and doing so with high levels of liquidity.

Second, in aggregate, as a *system of derivatives*, they have moved to the centre of global finance as a source of information about the changing relative values of financial assets. Movements in derivative prices place intense pressures on the owners of assets to deliver rates of return that are competitive internationally, and their success or failure in doing so is directly reflected in derivative markets.

In combination, these two functions cast a different interpretation on the foundations of the current global financial system. The money functions of derivatives, and the role of derivatives in valuing capital, are causing the concepts of money and capital to merge. For instance, the profitability of capital and the rate of conversion between monetary forms are now not separate processes.

The same could have been said of gold – it was both money and capital. But in both roles it was, ironically, probably far more benign than what we are now witnessing.

Acknowledgements

This paper has benefited from the inputs of participants in presentations at the Centre for Global Political Economy, Sussex University and the Centre for the Study of Globalisation and Regionalisation, Warwick University, and from two anonymous reviewers.

Notes

- 1 But, as Richard Cooper notes, this strength was also a weakness. While the Gold Standard provided a rigid anchor for world prices, no government was responsible for managing fluctuations in the demand for and supply of gold. So the system was prone to sharp global liquidity shocks, and prices for traded goods were also more volatile than under the Bretton Woods regime (cited in McKinnon 1993).
- 2 In fact, international monetary relations became robust enough for short-term capital flows to often substitute for gold as the swing variable for balancing international payments (McKinnon 1993).
- 3 McKinnon (1981: 555) argues that most critics of the rational speculation hypothesis of exchange rate determination at the time implicitly accepted the premise of the insular national economy, but attacked the notion that all private speculation was naturally stabilizing. In monetary policy terms, therefore, both implicitly or explicitly presumed 'that the demand for each national money is stable and not much influenced by events in the foreign exchange market'.
- 4 The implicit link between efficient prices and fundamentals is sometimes made explicit. Even Eugene Fama (1965), for instance, has said that, '...in an efficient market, at any point in time the actual price of a security will be a good estimate of its intrinsic value'. See however Beechey *et al.* (2000) for the case that efficient markets and asset pricing are related but distinct concepts.
- 5 Obstfeld (1985) reported that 'short-term volatility of exchange rates, both in real and in nominal terms, has been one of the most striking features of the float'. He went on to argue that such volatility was to be expected in view of the exchange rate being the relative price of two assets, and with the phenomenal increase in international asset trade, capital account transactions now dominate exchange rate determination. But while there had been an increase in real exchange rate volatility, this volatility was somewhat less pronounced than in other asset markets such as stock markets. Edey and Hyvbig (1995) show that a similar pattern of exchange rate volatility continued into the 1990s.
- 6 Initially, these movements away from expected fundamentals were labelled 'misalignments', and were thought to be a product of a transitional or at least temporary nature.
- 7 Most notably the Bank for International Settlements and the Basel Accords.
- 8 Frank Partnoy (2002) has pointed out that the current system also involves a range of (largely private) regulatory gatekeepers, such as ratings agencies, investment banks, auditing firms, lawyers, the International Swaps and Derivatives Association, the National Association of Securities Dealers in the US and their counterparts in other countries, and so on.
- 9 Foreign exchange swaps made up exactly half of the value of daily turnover on foreign exchange markets in 2004 (see Bank for International Settlements 2005).
- 10 See also Eichengreen and Iverson (1999). Kay and Mott (1982) provide an account of the transition from liberal to social democracy and implications for the understanding of state 'policy'.
- 11 Labour was indeed quite mobile in some periods of the nineteenth century and the evolution of the modern state can in part be associated with the need to deal with the effects of the emergence

- of surplus populations, including the threat of its mobility (Cowen and Shenton 1996). We are depicting labour as 'national' in our analysis, because labour was treated 'as if' it were national.
- 12 This is not to idealize the 'adjustment mechanism' under the Gold Standard. The price of labour, to paraphrase Keynes, was often 'sticky' downwards. As historians often remind us, attempts to make it less sticky in the nineteenth century varied, but often involved force.
 - 13 In this sense, derivative markets can be understood as performative (vide Callon 1998).
 - 14 The role of breaking unions as a path to international financial stability shows no more clearly than in the early 1980s in the United States, with Paul Volker as Chair of the Federal Reserve Board. Panitch and Gindin (2004) note that, on the insistence of Congress, Volcker himself represented the US state in Chrysler's bankruptcy proceedings and that it was he who negotiated with the United Auto Workers, then America's most powerful union, to secure the wage cuts and out-sourcing that the state required before granting Chrysler a bail-out loan. Paul Volcker (2000) also said that, as Chairman of the Federal Reserve, his actions were geared toward America's international responsibilities:

... [I]f we weren't strong economically, we weren't going to be able to carry out what I saw as reasonable responsibilities in the world... and if anybody was going to deal with this it was going to have to be the Federal Reserve. . . . One of the major factors in turning the tide on the inflationary situation was the (air traffic) controllers' strike, because here, for the first time, it wasn't really a fight about wages; it was a fight about working conditions. It was directly a wage problem, but the controllers were government employees, and the government didn't back down. And he [Reagan] stood there and said, 'If you're going to go on strike, you're going to lose your job, and we'll make out without you.'

That had a profound effect on the aggressiveness of labor at that time, in the midst of this inflationary problem and other economic problems. I am told that the administration pretty much took off the shelf plans that had been developed in the Carter administration, but whether the Carter administration ever would have done it is the open question. That was something of a watershed.

- 15 This is not to gainsay that all capital wants labour to be cheaper, but that for globally integrated capital, wage movements on an aggregate, national scale provide insufficiently fine adjustments.

References

- 1 Bank for International Settlements (BIS) (2005) *Triennial central bank survey: foreign exchange and derivative activity in 2004*, Basel, at <http://www.bis.org/publ/rpfx05t.pdf>
- Beechey, M. Gruen, D. and Vickery, J. (2000) *The efficient markets hypothesis: a survey*, Reserve Bank of Australia Discussion Paper (Sydney: RBA).
- Blanchard, O. and Watson, M. (1982) Bubbles, rational expectations, and financial markets, in P. Wachtel (ed.), *Crisis in the Economic and Financial Structure* (New York: Lexington Books).
- Bryan, D. (2001) Global accumulation and accounting for national economic identity, *Review of Radical Political Economics*, 33(1):.
- 2 Bryan, D. and Rafferty, M. (2006) *Capitalism with Derivatives: A Political Economy of Financial Derivatives, Capital and Class* (London: Palgrave Macmillan).
- 3 Callon, M. (ed.) (1998) *The Laws of the Markets* (Oxford: Blackwell).
- Camdessus, M. (1996) Is the New Bretton Woods conceivable? Address by managing director of the IMF, IMF 96/1, Washington, January.
- Cohen, B.J. (1998) *The Geography of Money* (Ithica, NY: Cornell University Press).
- Cooper, R. (1982) The gold standard: historical facts and future prospects, *Brookings Papers on Economic Activity*, 1: 1-45.

- Cowen, M. and Shenton, B. (1996) *Doctrines of Development* (London: Routledge).
- De Cecco, M. (1974) *Money and Empire: The International Gold Standard* (London: Blackwell).
- Donaldson, R. and Kamstra, M. (1996) Stare down the barrel and centre the crosshairs: targeting the ex ante equity premium, Federal Reserve Bank of Atlanta, Working Paper 4, February.
- Dooley, M., Folkerts-Landau, D. and Garber, P. (2003) An essay on the revived Bretton Woods system, NBER Working Paper 9971, September.
- Dooley, M., Folkerts-Landau, D. and Garber, P. (2004) Direct investment, rising real wages and the absorption of excess labor in the periphery, NBER Working Paper 1026, July.
- Edey, M. and Hyvbig, K. (1995) An assessment of financial reform in OECD countries, *OECD Economic Studies*, 25(11): .
- Eichengreen, B. (1998) *Globalizing Capital: A History of the International Money System* (Princeton, NJ: Princeton University Press).
- Eichengreen, B. (2004) Global imbalances and the lessons of Bretton Woods, NBER Working Paper 10497, May.
- Eichengreen, B. and Iversen, T. (1999) Institutions and economic performance: evidence from the labour market, *Oxford Review of Economic Policy*, 15(4): 121–138.
- Eichengreen, B. and Sussman, N. (2000) The international monetary system in the (very) long run, IMF Working Paper WP/00/43, Washington, March.
- Fama, E. (1965) The behaviour of stock markets, *Journal of Business*, 38: .
- Flood, R. and Garber, P. (1980) An economic theory of monetary reform, *Journal of Political Economy*, 88(1): 24–58.
- Friedman, M. (1953) The case for flexible exchange rates, in *Essays in Positive Economics* (Chicago: University of Chicago Press).
- Gordon, M. (1962) *The Investment, Financing and Valuation of the Corporation* (Homewood, ILL: Irwin).
- Gosh, A., Gulde, A. and Wolf, H. (2002) *Exchange Rate Regimes: Choices and Consequences* (Cambridge, MA: MIT Press).
- Hartmann, P. (1998) *Currency Competition and Foreign Exchange Markets: The Dollar, the Yen and the Euro* (Cambridge: Cambridge University Press).
- Haugen, R. (1996) *The New Finance: The Case Against Efficient Markets* (New York: Prentice Hall).
- Hodrick, R. (1990) Volatility in the foreign exchange and stock markets: is it excessive?, *American Economic Association Papers and Proceedings*, 80(2): .
- Jensen, M. (1978) Some anomalous evidence regarding market efficiency, *Journal of Financial Economics*, 6(2–3): .
- Johnson, H. (1969) The case for flexible exchange rates, *Federal Reserve Bank of St. Louis Review*, 51, reprinted in H. Johnson, *Further Essays in Monetary Economics* (London: Allen and Unwin, 1972).
- Kamstra, M. (2001) Rational exuberance: the fundamentals of pricing firms, from blue chip to 'dotcom', Federal Reserve Bank of Atlanta Working Paper 21, November.
- Kay, G. and Mott, J. (1982) *Political Order and the Law of Labour* (London: Macmillan).
- Kindleberger, C. (1984) *A Financial History of Western Europe* (London: Allen & Unwin).
- LeRoy, S. and Porter, R. (1981) The present-value relation: tests based on implied variance bounds, *Econometrica*, 49(3): 555–574.
- LiPuma, E. and Lee, B. (2004) *Financial Derivatives and the Globalization of Risk* (Durham, NC: Duke University Press).
- Malkiel, B. and Xu, Y. (1997) Risk and return revisited, *Journal of Portfolio Management*, 23: 9–15.
- McKinnon, R. (1981) The exchange rate and macroeconomic policy: changing postwar policy prescriptions, *Journal of Economic Literature*, 19(2): 531–557.
- McKinnon, R. (1993) The rules of the game: international money in historical perspective, *Journal of Economic Literature*, 31: 1–44.
- Meese, R. (1986) Testing for bubbles in exchange markets, *Journal of Political Economy*, 94(2): 345–373.

4

5

6

7

8

9

10

11

12

- Meese, R. and Rogoff, K. (1983) Empirical exchange rate models of the seventies: do they fit out of sample?, *Journal of International Economics*, 14(1-2): 3-24.
- 13 Nurkse, R. (1944) *International Currency Experience* (Geneva: League of Nations).
- Obstfeld, M. (1985) Floating exchange rates: experiences and prospects?, *Brookings Papers on Economic Activity*, 2: 369-450.
- Obstfeld, M. and Rogoff, K. (1995) The mirage of fixed exchange rates, *Journal of Economic Perspectives*, 9(4): 73-96.
- Panitch, L. and Gindin, S. (2004) *Global Capitalism and American Empire* (London: Merlin Press).
- Partnoy, F. (2002) ISDA, NASD, CFMA, and SDNY: the four horsemen of derivatives regulation?, *Brookings-Wharton Papers on Financial Services*, pp. 213-252 (Washington, DC: Brookings Institution Press).
- Pontiff, J. (1997) Excess volatility and closed-end funds, *American Economic Review*, 87(1): 155-169.
- Portes, R. and Rey, H. (1998) The emergence of the euro as an international currency, *Economic Policy*, 26: 307-343.
- Schleifer, A. and Summers, L. (1990) The noise trader approach to finance, *Journal of Economic Perspectives*, 4(2): 19-33.
- Schleifer, A. and Vishny, R. (1997) The limits of arbitrage, *Journal of Finance*, 52(1): 35-55.
- 14 Schwartz, P. (2000) A new Bretton Woods or monetary competition, *Cato Journal*, 20(2): .
- Shiller, R. (1981) Do stock prices move too much to be justified by subsequent changes in dividends?, *American Economic Review*, 71(3): 421-436.
- Shiller, R. (1989) *Market Volatility* (Cambridge, MA: MIT Press).
- Siourounis, G. (2004) Capital flows and exchange rates: an empirical analysis, London Business School, mimeo, at <http://faculty.haas.berkeley.edu/lyons/Siourounis%20capital%20flows%20and%20exchange%20rates.pdf>
- Solomon, R. (1982) *The International Monetary System 1945-76* (New York: Harper and Row).
- Strange, S. (1986) *Casino Capitalism* (New York: Blackwell).
- Summers, L. (1986) Does the stock market rationally reflect fundamental values?, *Journal of Finance*, 41(3): 591-601.
- Volcker, P. (2000) Commanding heights, interview with Paul Volcker on PBS radio, transcript 26 September, at http://www.pbs.org/wgbh/commandingheights/shared/minitextlo/int_paulvolcker.html
- Vrolijk, C. (1997) Derivatives' effect on monetary policy transmission, IMF Monetary and Exchange Department, Working Paper WP-97-121, Washington, September.
- 15 Williamson, J. (1983) Keynes and the international economic order, in *Political Economy and International Money: Selected Essays of John Williamson* (New York: New York University Press).