

NBER WORKING PAPER SERIES

MONETARY POLICY IN A CHANGING INTERNATIONAL ENVIRONMENT:  
THE ROLE OF CAPITAL FLOWS

Martin Feldstein

Working Paper 11856  
<http://www.nber.org/papers/w11856>

NATIONAL BUREAU OF ECONOMIC RESEARCH  
1050 Massachusetts Avenue  
Cambridge, MA 02138  
December 2005

The views expressed herein are those of the author(s) and do not necessarily reflect the views of the National Bureau of Economic Research.

©2005 by Martin Feldstein. All rights reserved. Short sections of text, not to exceed two paragraphs, may be quoted without explicit permission provided that full credit, including © notice, is given to the source.

Monetary Policy in a Changing International Environment: The Role of Global Capital Flows  
Martin Feldstein  
NBER Working Paper No. 11856  
December 2005  
JEL No. E0, F0

### **ABSTRACT**

The Feldstein-Horioka study of 1980 found that OECD countries with high saving rates had high investment rates and vice versa, contrary to the traditional theory of global capital market integration. This capital market segmentation view, which has been verified in various studies over the past several decades, has important implications for tax and monetary policy.

More recently, Alan Greenspan and John Helliwell have shown that the link between domestic saving and domestic investment became substantially weaker after the mid-1990s. The research reported in the current paper suggests that this is true of the smaller OECD countries but not of the larger ones. When observations are weighted by each country's GDP, the savings-investment link (i.e., the savings retention coefficient) remains relatively high.

This paper also examines the recent capital flows to the United States. The Treasury International Capital (TIC) reports are generally misunderstood. When they are properly interpreted, they do not indicate that the U.S. has an excess of capital flows to finance the current account deficit. The TIC data also cannot be relied on to distinguish private and government sources of the capital flow. The persistence of these flows is therefore uncertain.

The paper discusses the implications for monetary and fiscal policy of the changes in capital flows that may be happening.

Martin Feldstein  
NBER  
1050 Massachusetts Avenue  
Cambridge, MA 02138-5398  
mfeldstein@nber.org

Monetary Policy in a Changing International Environment:  
The Role of Global Capital Flows

Martin Feldstein\*

During the past two decades, the global economy has changed in many ways that have potentially important implications for monetary policy in different countries. For example, the creation of the Euro and, more recently, the substantial weakening of the Stability Pact, have important implications not only for the European Central Bank but also for other non-euro central banks both in Europe and elsewhere. The economic and currency crises that hit Asia and Latin America at the end of the 1990s have led to a widespread (but not universal) shift from completely fixed exchange rates to managed floating rates, a change that requires a fundamental shift in monetary policy in those countries. Mexico is an outstanding example of a country that has shifted from a history of overvalued exchange rates to a successful system of floating rates and sound monetary policy that has brought Mexico's inflation to less than 4 percent in the past year.

In this paper I will discuss two aspects of the changing international environment that could affect the management of monetary policy in the country that I know best, the United States. My focus is on the apparent increase in the integration of the global capital market. As I will explain, this apparent increase in integration reflects two things: the changing behavior of private investors in the industrial countries and the current exchange rate policy of China and some other Asian countries. If this increased capital market integration is actually happening and if it persists in the future, it has important implications for the power of U.S. monetary policy and therefore implications about how that policy should be conducted.

According to the standard textbook view of the international capital market,

---

\*Professor of Economics, Harvard University, and President and CEO of the National Bureau of Economic Research. This paper was prepared for delivery at the 80<sup>th</sup> Anniversary of the Bank of Mexico, 15 November 2005, in Mexico City. I am grateful to Governor Guillermo Ortiz for suggesting the topic of monetary policy in a changing international environment.

the savings that originate in each country are invested around the world in those countries and assets where those savings can earn the highest risk-adjusted expected rates of return. I never thought very hard about this assumption until I attended a conference at the OECD nearly 30 years ago. As an outsider to the fraternity of international economics specialists, I was surprised that all of the discussion at that meeting assumed that the textbook view of complete capital market integration was a correct description of the real world. My sense of surprise reflected the fact that the implications of such complete global capital market integration contradicted my view – and that of most other economists who study tax policy – that policies that increase a nation’s domestic saving rate would lead to more domestic investment. It also contradicted another standard assumption of tax analysis: that a corporate income tax would be borne largely by the owners of capital in the country that levied the tax. If the capital market is truly global, capital could flee the country that levied the corporate tax, implying that relatively little of the tax would be born by local capital owners. Moreover, the integrated global capital market view also implied that a large fiscal deficit would not reduce domestic investment or raise the domestic interest rate.

This view of a globally integrated capital market also seemed to me to go against a few basic facts that I thought I knew. In particular, the U.S. had a relatively low national saving rate and yet attracted very little capital from the rest of the world (in those days) while Japan had a high saving rate and a high investment share of GDP. When I returned to Cambridge after that meeting, I therefore did a very simple test of the capital market integration hypothesis together with Charles Horioka, then a graduate student at Harvard and now a distinguished professor at Osaka University in Japan (Feldstein and Horioka, 1980). We estimated a regression equation relating the investment-GDP ratio to the savings-GDP ratio for the 16 OECD countries for which comparable data were then available. To focus on the long-term relation rather than year to year variations in savings and investment, we related the average saving ratio and the average investment ratio for the period 1960 through 1974.<sup>2</sup>

---

<sup>2</sup>Five of the 21 countries that were then members of the OECD did not have consistent data on savings and investment for the 15 year period of our study because of a change in national income accounting methods during the sample years and were therefore dropped from the sample.

Our evidence was in strong contrast to the capital market integration assumption. We found that savings tend to remain in the country in which they originate. More specifically, each one percent increase in a country's savings-GDP ratio increased the investment-GDP ratio of that country by more than 0.8 percent. This 80-plus percent "savings retention coefficient" implied that a country that raises its savings-GDP ratio by (say) five percentage points would raise its investment-GDP ratio by more than four percentage points.

A good deal of subsequent work confirmed this general relation and showed that it was not just restricted to the OECD countries or to the period from 1960 to 1974 that Charles Horioka and I had studied. Michael Mussa and Morris Goldstein (1993), among others, showed that it applied to a much larger sample of developed and developing countries. In a subsequent study (Feldstein, 1983) I showed that it was not the result of a simultaneous relation in which high investment leads to high savings. Maurice Obstfeld and Kenneth Rogoff (2001) and Rene Stulz (2005) provided explanations of why the observed capital market segmentation might be true.<sup>3</sup>

This "segmented global capital market" view that savings largely remain in the country of origin confirmed the assumptions that underlie the basic analysis of tax and budget policy. It also implied that monetary policy works primarily through domestic channels. When the Federal Reserve raises the short term interest rate, arbitrage behavior generally causes longer term real rates to rise as well, dampening business investment, residential construction, and, through wealth effects, consumer spending. The higher interest rates may also cause some increase in the value of the dollar, reducing net exports, but this is not the primary mechanism by which a tighter monetary policy reduces aggregate demand.

### New Evidence?

There now appears to be evidence that the nature of the global capital market may be changing and becoming less segmented in ways that are important for U.S. monetary and fiscal policy. This appears to be happening in two ways. First, the savings retention coefficient among the OECD countries appears to have

---

<sup>3</sup>For an extensive survey of statistical studies of the Feldstein-Horioka relation, see Coackly (1998).

declined significantly, a change noted by Alan Greenspan (2005a,2005b) and John Helliwell (2004). Second, the long-term interest rates in the United States have been depressed by massive inflows of funds that I believe are coming from Asian governments. Let me comment on each of these in turn.

I have been doing some work with John Friedman, a graduate student at Harvard, on the changing behavior of the savings retention coefficient in the OECD countries. Our research is still preliminary but I think worth attention in the current context. We find a sharp decline in the savings retention coefficient when we give equal weight to each of the countries in the sample but only a modest decline when we weight each observation by the GDP of the country. Stated differently, the original segmentation of the global capital market appears to have persisted among the major industrial countries of the OECD while the smaller economies are now more integrated into a global capital market.

More specifically, when we look at the 16 OECD countries in the original Feldstein-Horioka sample and weight each country equally we find that the savings retention coefficient for the decade 1971 to 1980 is only 0.58, already down significantly from the original estimate for the fifteen year period from 1960 to 1974.<sup>4</sup> The savings retention coefficient estimated for each subsequent decade (i.e., the decades ending in 1981, 1982, etc.) remains in the range between 0.55 and 0.69 until the decade ending in 1992. It then falls sharply in the 1990s until it reaches only 0.19 for the decade ending in 2002, the last year for which we have complete data.

This same pattern holds for a larger sample of all of the current 30 OECD countries. The savings retention coefficient is 0.64 for the decade ending in 1981 and remains above 0.55 until the decade ending in 1996. It then falls rapidly until it is only 0.30 in the decade ending in 2001.

Taken at face value, these estimates imply a sharp decline in the segmentation of the capital market among the industrial countries of the OECD. But the result is dominated by the behavior of the smaller economies. When we weight each observation by the GDP of the country, we see a much more modest

---

<sup>4</sup>Comparable data do not exist for the earlier period so we cannot extend our sample to those earlier years. Our analysis uses data compiled by the World Bank.

decline and a much higher recent value of the savings retention coefficient.

For the original sample of 16 countries, the savings retention coefficient estimated with GDP weights is 0.93 for the decade ending in 1980. It remains above 0.70 for successive decade samples until the decade ending in 2000 and then drops to 0.64 for the decade ending in 2001 and 0.57 for the decade ending in 2002.

The results are very similar for the larger sample of 30 OECD countries when each observation is weighted by that country's GDP. The saving retention coefficient is 0.92 for the decade ending in 1980 and remains above 0.70 in successive decade estimates until the decade ending in 2000. It then falls slightly to 0.65 for the decade ending in 2001 and to 0.59 for the decade ending in 2002. These results imply that on average about two-thirds of the savings remain in the country of origin.

Let me say a few words of caution about interpreting these results. First, this evidence on the declining savings retention coefficient only applies to the OECD countries. I think that the estimated savings retention coefficient is likely to remain high if we expand the sample to include the large number of developing countries and middle income countries that are not in the OECD, reflecting the greater default risk and exchange rate risk associated with lending to such countries, the less developed character of their capital markets, their use of controls on outbound capital, etc.. Second, even among the OECD countries there are some anomalies that deserve more study. Ireland, Luxembourg, and Norway are among those countries in which the savings and investment rates now differ the most, suggesting that what we are observing may be the spurious effect of tax avoidance and evasion and, in the case of Norway, of the government's energy income investment policy.

It is not clear why the previous segmentation of the capital market among the OECD countries should have declined. One possibility is that the capital markets among those OECD countries that are part of the euro area have become much more closely integrated because the euro eliminates exchange rate risk among those countries. Alternatively, the past few years have also seen an enormous growth of "over the counter" derivatives, permitting cross-border investors to protect themselves at longer maturities against potential exchange rate

fluctuations. I hope that my research with John Friedman will clarify this or find other explanations.

Although the true state of the capital market integration is unknown, there are important implications for monetary and tax policy if the capital market has in fact become more fully integrated. It is therefore worth considering the implication for monetary policy of the possibility that the true savings retention coefficient has actually declined among industrial countries and the capital markets of those countries have become more integrated.

### The Recent Capital Flows to the United States

Before considering those implications, I want to comment on the increased magnitude of the flow of capital to the United States in recent years and on the changing nature of that capital inflow. The U.S. current account is currently running at an annual rate of \$800 billion. As recently as five years ago (in 2000), the current account deficit was only half that (\$415 billion) and in 1997 it was less than one-fifth of today's level (\$141 billion). At \$800 billion, the current account deficit is more than six percent of U.S. GDP. As Sebastian Edwards (2005) has recently emphasized, no other major industrial country has experienced such a large sustained current account deficit, both absolutely and even as a percent of GDP.

Back in 2000, the U.S. current account deficit was being financed by a net inflow of equity funds. Some of this took the form of foreign direct investment while the rest was portfolio investment. The fact that the inflow was equity financed implies that it was private foreign investors who were shifting funds to the United States because they regarded the potential return on equity investments in the U.S. to be more attractive on a risk-adjusted basis than alternative uses of those funds.

The recent capital flow to the United States is very different. There is very little equity flow to the United States and the equity outflow from the United States has generally been as large or larger than the equity inflow. The very large current account deficits are now being financed by net inflows of fixed income funds.



The precise nature and source of these funds is not known. We do not know the extent to which these funds are coming from private investors and the extent to which the funds are coming from governments or quasi-government institutions. We also don't know the countries from which the funds originate.

One indication of the large amount coming from governments is the fact that the deposits at the Federal Reserve on behalf of foreign governments rose by \$269 billion during the year 2004, thus accounting for 40 percent of that year's total net capital inflow. But that is only part of the inflow from foreign governments.

To understand this, let me comment on how the U.S. government measures capital flows. The Treasury Department reports monthly estimates of long-term capital flows in the Treasury International Capital release (known as the TIC report). These data, which are widely used by market participants to measure how the U.S. finances its current account deficit, are generally misunderstood in two important ways.

First, these TIC data exclude short term capital flows (bank deposits, etc.) and flows of direct investment. Since the U.S. reserve position is essentially unchanged from month to month, the discrepancy between the TIC measure of capital inflow and the current account deficit is essentially due to these short-term flows and the direct investment flows. The TIC data should therefore not be taken as a measure of how easy or hard it is for the U.S. to finance its current account deficit.

Second, the TIC report also has an easily misunderstood classification of whether the funds are from governments or from private sources. While a direct purchase of U.S. bonds by a foreign government is correctly classified, the TIC measure of inflows from "private" sources overstates the actual private investment because it does not distinguish between a purchase by a private buyer for its own account and a purchase executed by a private institution on behalf of a foreign government. For example, if the Chinese government purchases U.S. bonds through Deutsche Bank or CSFB, that will be recorded in the TIC data as a private purchase. I believe that the TIC data also classify public institutions like the Chinese nationally owned banks as private purchasers.

My own belief, based on widespread conversations with government and international officials but no hard data, is that the substantial inflow of debt capital that now finances the U.S. current account deficit is coming primarily, perhaps overwhelmingly, from governments and from institutions acting on behalf of governments. This means that the current capital inflow is very different from the capital inflow before 2000 when it reflected private decisions based on a balancing of the risks and returns on U.S. assets and on the assets in other countries.

Instead, the current capital inflow from direct and indirect government sources in Asia reflects strategies of reserve accumulation and of exchange rate management. After the painful experience of the late 1990s, several of the Asian governments resolved to accumulate enough foreign exchange reserves to eliminate or virtually eliminate the risk of unwarranted speculative attacks. They recognized that reserves could not protect a currency that is truly overvalued but wanted to prevent the destabilizing effects of speculators trying to undermine a currency that was essentially healthy. To do so, they abandoned the old guideline that foreign exchange reserves should equal three months of imports in favor of a much larger target amount of reserves that would be enough to deter speculators. As a result, South Korea now has more than \$200 billion of reserves, Taiwan more than \$250 billion, Singapore more than \$100 billion, etc..

The resulting demand for dollar bonds and shorter term dollar notes helped to finance the ballooning U.S. current account deficit and appeared as increased capital mobility during the past five years. It is not at all clear that this supply of funds to the U.S. will continue. The capital flow that accompanied the accumulation of reserves by these Asian countries is more likely to have been a kind of portfolio transition rather than a new sustained level of capital flows.

Accumulating a defensive war chest of reserves was not the only reason that these countries bought very large amounts of dollar bonds. These governments were also seeking to maintain the competitiveness of their countries' products by keeping the exchange value of their currencies low. The Japanese government used export promotion as a way to stimulate demand and to recover from the long slump that began in the early 1990s. The Chinese government maintained a fixed exchange rate in the late 1990s to contribute to the stability of the region during the Asian currency crisis but then continued to stabilize the value of the yuan in order to promote exports. A number of countries in Asia effectively restricted

currency fluctuations relative to the dollar in order to maintain an unchanged exchange rate relative to the yuan.

Although the Japanese have stopped official intervention by the Bank of Japan, the yen has actually declined further relative to the dollar. This may reflect private market forces or it may be the result of continued government-inspired pressure on the yen through the investment policies of the postal savings system and other Japanese public and quasi-public entities.

The Chinese government allowed the yuan to appreciate by two percent (from 8.28 yuan per dollar to 8.09 yuan per dollar) earlier this year and, despite allowing it in principle to move gradually each day, has essentially kept it at its new 8.09 yuan per dollar value since then. Doing so has required the Chinese to offset not only large trade surpluses that have grown to \$100 billion this year but also the substantial flows of investment funds and speculative balances that are coming to China. Doing so has involved increased buying of dollar bonds. China's official reserves have grown to more than \$750 billion and additional dollar assets are held in other forms.

Although these government purchases of dollar bonds appear to be an increase in global capital market integration, it is really very different from the kind of capital market integration that the standard textbook analysis envisions. Instead of private investors driven by differences in risk and return, these flows have been driven by governments concerned with speculative attacks and export promotion. It is not clear therefore how long this new pattern of flows will continue.

### Implications for Monetary Policy

But even with this uncertainty about the current nature and the future persistence of international capital flows, it is important to ask how this change, if true, might affect monetary policy. Consider first the response of monetary policy to excess demand. If the Federal Reserve perceives that demand pressures will produce inflation rates above its desired range, it will tighten monetary policy by raising the federal funds rate above what it regards as a neutral rate. How far it has to raise rates to get any degree of counter-inflationary pressure in the economy depends on how other financial variables – particularly long term interest rates and

exchange rates – respond to the increase in the federal funds rate.

In a closed economy or with a highly segmented global capital market, the rise in the federal funds rate would cause longer term real rates to rise as well. This would reduce the value of household wealth in the form of stocks and owner-occupied homes. That in turn would reduce consumer spending on durables and nondurables. In addition, the rise in the long-term real interest rates would raise the cost of funds for investments in housing and in business plant and equipment.

But if OECD capital flows to the U.S. were highly elastic with respect to the U.S. long-term interest rate and if the Asian governments maintained the exchange values of their currencies relative to the dollar, the economy's response to Federal Reserve tightening would be very different. The response of the long-term interest rate to the higher federal funds rate would be very limited. The dollar might strengthen a bit relative to the other OECD currencies but not relative to those of the Asian currencies that are being fixed or nearly fixed by their governments.

The net impact of this would be to make any given rise in the federal funds rate less contractionary. To achieve any desired reduction in demand and therefore in inflation, the Federal Reserve would have to raise the federal funds rate more than would be needed if global capital markets were more segmented.

Now consider the opposite problem that the Federal Reserve could face: a slowing of aggregate demand at a time when the inflation rate is at or below its desired level. In a relatively closed economy or in a world with a segmented global capital market, an easing of the federal funds interest rate would cause longer-term rates to fall because capital would not leave the U.S. in pursuit of higher yields elsewhere. The lower rates would stimulate domestic spending by consumers and businesses, reinvigorating aggregate demand. In addition, the reduced interest rates and weaker economic activity would cause the dollar to fall, stimulating exports and making imports less attractive. In these ways, the reduced federal funds rate would contribute to the economic recovery.

But if long-term capital is very mobile among the OECD countries while the Asian countries prevent their currencies from rising against the dollar, these channels of influence would not work. Long-term bond rates would not fall and the dollar would not become more competitive against its Asian trading partners.

The Federal Reserve would have to reduce the short-rate further than it would if long-rates and the dollar responded.

Robert Mundell taught us many years ago that, in a world of flexible exchange rates and integrated capital markets, an easy money policy would not lower interest rates but would nevertheless be expansionary by lowering the value of the currency. In contrast, with a fixed exchange rate, monetary policy is ineffective but fiscal policy can raise or lower aggregate demand.

We may now be facing something of a hybrid situation in which the dollar is flexible against the euro and some other non-Asian currencies but not against the Chinese yuan and other Asian currencies. A reduction of the federal funds rate would have relatively little expansionary impact on longer term rates if funds would flow out to the euro area. Although that could change the dollar-euro exchange rate, the Chinese government would buy dollar bonds rather than allowing the dollar to fall against the yuan. Other Asian governments might act in a similar way to maintain their exchange rate vis-a-vis the yuan and the dollar. Although the exchange rate may decline against the non-Asian currencies to the limited extent that the short rates drive exchange rates, the overall trade-weighted exchange rate would fall relatively little. In such a context, monetary policy would be relatively weak, suggesting that reductions in the federal funds rate would have to be greater to have a significant impact and that expansionary fiscal policy would be more effective than it would be if all currencies were flexible.

At this stage, we don't know how much the previously segmented OECD capital market has become integrated. Has there been a general decline in capital market segmentation or is it limited to the smaller countries, as the estimates that I have presented suggest? Nor do we know how much of the capital flow to the U.S. is from Asian governments that will continue to pursue essentially fixed exchange rate policies, forcing any shift of the dollar to focus on the exchange rates with the euro and other non-Asian currencies.

There is no doubt however that the current uncertainty about these potential changes in the international economic environment has complicated the task of monetary policy.

Cambridge, November 15, 2005

## References

Coakly, Jerry et. al., "The Feldstein-Horioka Puzzle and Capital Mobility: A Review," International Journal of Finance and Economics, 3, 1998, pp 169-88

Edwards, Sebastian, "The End of Large Current Account Deficits, 1970-2002: Are There Lessons for the United States?," NBER Working Paper 11669 (2005)  
Forthcoming in The Greenspan Era: Lessons for the Future. Kansas City, MO: Federal Reserve Bank of Kansas City, 2005.

Feldstein, Martin and Charles Horioka, "Domestic Savings and International Capital Flows," The 1979 W. A. Mackintosh Lecture at Queen's University, Economic Journal, June 1980, 90(358), pp 314-329.

Feldstein, Martin, "Domestic Saving and International Capital Movements in the Long Run and the Short Run," European Economic Review, No. 21 (1-2), 1983, pp 129-151.

Greenspan, Alan, "Current Account," Remarks at Advancing Enterprise 2005 Conference, London, England, February 4, 2005a

Greenspan, Alan, "Stability and Economic Growth: The Role of the Central Bank", Remarks at the Banco de Mexico's 80th Anniversary International Conference, Mexico City, November 14, 2005b

Helliwell, John, "Demographic Change and International Factor Mobility," in Global Demographic Change: Economic Impacts and Policy Changes," Kansas City, MO: Federal Reserve Bank of Kansas City, 2004, pp 369-420.

Mussa, Michael, and Morris Goldstein, "The Integration of World Capital Markets." In Changing Capital Markets: Implications for Monetary Policy. Kansas City, MO: Federal Reserve Bank of Kansas City, 1993, pp. 245-313.

Obstfeld, Maurice and Kenneth Rogoff, “The Six Major Puzzles in International Economics: Is there a common cause?” in NBER Macroeconomic Annual for 2000, volume 15, (2001) pp 359-89

Stulz, Rene “The Limits of Financial Globalization,” NBER Working Paper 11070