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Discussion of William R. White
"Globalisation and the Determinants of Domestic Inflation" *

Globalisation, Inflation and Monetary Policy
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I would like to thank Governor Noyer and the Banque de France for organizing this stimulating conference on globalization, inflation and monetary policy. With strong global growth boosting oil, food and materials prices, the linkages between globalization and domestic inflation—one focus of Bill White's interesting paper--are very much on the minds of monetary policymakers these days. I will return to this development as I conclude my remarks.

Bill White's paper is an ambitious attempt to identify the main factors responsible for the decline in global inflation since the 1970s and the persistence of low global inflation in recent years. The stylized facts about inflation that Bill documents are striking. Over the past 25 years, the level and volatility of domestic inflation rates have declined significantly worldwide. The decline began in industrial countries in the early 1980s and then occurred in many developing countries in the 1990s. In addition, the inflation process has changed noticeably over this period. Inflation expectations have declined and become better-anchored, shocks to inflation have become less persistent,

* The views expressed here are my own and not necessarily those of my colleagues in the Federal Reserve System or on the FOMC. I would like to acknowledge excellent assistance from Reuven Glick, John Judd, and Judith Goff in the preparation of these remarks

and there is less pass-through of shocks to energy and food prices and exchange rates into the overall inflation rate.

These developments raise two basic questions about the determinants of domestic inflation which Bill addresses. First, why did inflation fall in the 1980s and 1990s in so many countries? Second, is there a common factor or set of factors that explains why inflation has remained low in these countries in recent years despite, in Bill's view, increasing monetary stimulus?

Bill considers four possible explanations, finding each to have serious shortcomings.

The first explanation is "more effective central bank policy." But, in Bill's view, this does not explain why inflation fell sharply in countries with different degrees of economic and financial development, central bank independence, and exchange rate regimes. Nor does it account for why inflation has remained low recently despite accommodative monetary policy.

The second is domestic deregulation. Here he argues that it is unlikely to have been of sufficient magnitude to explain the phenomenon of sharply lower inflation worldwide, particularly since the extent of deregulation has varied across countries and has been notably lower in emerging market countries.

The third explanation is excess global saving, or, equivalently a global investment "drought." He argues that any resultant decline in aggregate demand might have been expected to lower not only inflation but also output growth, contrary to the robust growth evidenced worldwide, until this past year.

Fourth is globalization. He argues that it explains neither the sharpness with which inflation declined in the first place in the early 1980s in industrial countries, nor the long delay before inflation began to come down in emerging markets.

Because no single hypothesis adequately explains the full set of “stylized facts”, Bill advocates a global aggregate demand-aggregate supply approach in which all four explanations matter to inflation to varying degrees and at varying times. Demand-side factors, driven mainly by tighter domestic monetary policy, were central to the decline of inflation in the 1980s and 1990s. Supply-side factors, associated with both domestic deregulation and globalization, as well as lower aggregate demand associated with excess global saving, all have played a role in restraining inflation more recently.

I find Bill’s complementary approach--giving weight to factors that are global in scope and have impacted both demand and supply—to be sensible and appealing. For the United States, I agree that all four factors are relevant to inflationary trends. That said, I would probably ascribe somewhat less importance than Bill to the role of globalization and somewhat more to effective monetary policy in explaining why inflation was tamed in the 1980s and 1990s and why it has remained low since then.

With respect to globalization, I agree with Bill that, through its effect on relative prices, globalization has created both tailwinds and headwinds for central banks in their quest for price stability. Such shocks do not, in my view, alter in the least the ability of a central bank to attain its desired inflation objective over the medium term in a flexible exchange rate regime. But they do affect inflation in the short run, and they can make the attainment of a particular inflation goal easier or more painful by impacting NAIRU, at least for a time.   Increases in the prices of oil and other commodities due to strong global growth, have certainly created headwinds in recent years. In contrast, declines in the relative price of manufactured imports, due partly to the rapid expansion of capacity in China and other emerging markets, have created tailwinds that, for a time, made the Fed's job somewhat easier. The impact on inflation was similar to that associated with the pickup in productivity growth during the second half of the 1990s.

In my view, however, the impact of the tailwinds associated with global competition are frequently overstated.[1] Most research to assess the magnitude of direct and indirect linkages between import prices and inflation for the U.S. and other industrial countries finds that the impact, thus far, has been surprisingly limited. For example, a 2006 IMF analysis calculates that non-oil import price reductions lowered U.S. inflation by an average of ½ percentage point a year over the period from 1997 to 2005.[2] This finding is in line with an analysis at the Federal Reserve Board that estimates that lower (core) import prices reduced core U.S. inflation by an annual average of ½ to 1 percentage point over the past 10 years.[3] A Fed study focusing specifically on China's impact on U.S. consumer prices also finds only modest effects—since 1993, about 0.1 percentage point per year.[4] Remember that, even now, non-traded goods and services represent the large majority of U.S. domestic consumption.

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[1] This discussion draws on an earlier speech. See Janet Yellen (2006), "Monetary Policy in a Global Environment," speech delivered at the conference "The Euro and the Dollar in a Globalized Economy," University of California at Santa Cruz, Santa Cruz, California, May 27. http://www.frbsf.org/news/speeches/2006/0527.html

[2] *IMF World Economic Outlook*, April 2006, Ch.3.

[3] Cited in Donald L. Kohn, "Globalization, Inflation, and Monetary Policy," remarks delivered at the James R. Wilson Lecture Series, The College of Wooster, Wooster, Ohio, October 11, 2005. http://www.federalreserve.gov/boarddocs/speeches/2005/20051011/default.htm

[4] Steven Kamin, Mario Marazzi, and John Schindler (2006). "The Impact of Chinese Exports on Global Import Prices," *Review of International Economics*, 14 (2) (May) pp. 179-201.

Bill emphasizes, and I agree, that the effect of globalization on inflation may operate not just through import prices but also through other channels, including those relating to the labor market. Globalization has certainly enhanced the opportunities for firms to substitute imports for domestic output. And firms operating plants in several countries are increasingly able to shift production from domestic plants to those in lower-cost countries. These growing opportunities for substitution could certainly affect wage and price dynamics explaining, in particular, why the Phillips curve appears to have flattened in many industrial countries.

A review of the literature suggests that there is substantial empirical evidence that inflation in the U.S. has become less sensitive to measures of the domestic output gap.[5] One possible reason is that firms have become less willing to grant wage increases that would impair their cost-competitiveness, even in the face of tight domestic labor markets. This might diminish the sensitivity of wage inflation to domestic slack. However, San Francisco Fed staff find no change in the coefficient on the unemployment rate in wage-price Phillips curve in recent years. This suggests that, insofar as globalization has flattened the price-price Phillips curve, it is more likely to have done so through changes in firms' ability to mark up costs in setting prices than through changes in the effects of domestic slack on wage growth. This finding seems consistent with recent research at the Federal Reserve Board that finds evidence that U.S. tradeable goods prices and markups are increasingly sensitive to movements in foreign prices.[6]

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[5] See John Roberts (2006), "Monetary Policy and Inflation Dynamics," *International Journal of Central Banking,* vol. 2 (September), pp. 193-230.

[6] Luca Guerrieri, Christopher Gust and David Lopez-Salido (2008), "International Competition and Inflation: A New Keynesian Perspective," International Finance Discussion Paper No. 918, Board of

A flattening of the Phillips curve could explain why inflation has become less volatile in industrial countries. However, the finding of a flatter Phillips curve is open to differing interpretations. For example, a Board study estimates Phillips curve equations over the period 1977-2005 for 11 OECD countries and found the sensitivity of inflation to the domestic output gap has declined over time in many of the countries in the sample, but it found no evidence that this decline was attributable to globalization. [7] Other studies by the OECD and by Larry Ball draw similar conclusions.[8]

It is also worth considering the possibility that globalization could be holding inflation down by making workers in the U.S. and elsewhere more fearful of job loss, thus lowering wage demands. I agree with Bill that this may account for the declining wage share in output in the G-10 countries and could explain why, in the U.S. at least, there has been so little evidence of "real wage resistance" in the face of energy, food, and import price shocks. The empirical challenge is to estimate the effects of globalization through these channels when the actual substitution of inputs and outsourcing is limited, but the threat is large.

Provocative research at the BIS suggests that globalization is affecting inflation in yet another way, namely, by making domestic inflation increasingly sensitive to foreign, rather than domestic output gaps. This phenomenon could reflect an intensification of the

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Governors of the Federal Reserve System, January. http://www.federalreserve.gov/pubs/ifdp/2008/918/default.htm

[7] J. Ihrig, J, Stephen Kamin, D. Lindner and Jaime Marquez (2007), "Some Simple Tests of the Globalization and Inflation Hypothesis,"FRB International Finance Discussion Paper No. 891 http://www.federalreserve.gov/pubs/ifdp/2007/891/default.htm.

[8] Nigel Pain, Isabell Koske, and Marte Sollie (2006), "Globalization and Inflation in the OECD Economies," *OECD Economics Department Working Paper* No. 524. Paris, November http://oberon.sourceoecd.org/vl=919543/cl=64/nw=1/rpsv/cgi-bin/wppdf?file=5l9g2jl7twwg.pdf; and Laurence Ball (2006), "Has Globalization Changed Inflation?" NBER 12687.

degree of effective competition between domestic and foreign workers in the labor market due to globalization and might explain why inflation movements are so highly correlated across countries. Empirically, Borio and Filardo find that a measure of the global output gap has a significant effect on inflation in estimates of Phillips curve equations for a sample of 16 countries.[9] As Bill is careful to acknowledge, however, other empirical studies have drawn different conclusions. For example, the Board study I just referred to does not find any significant effect of foreign output gaps on domestic consumer price inflation. Moreover, San Francisco Fed staff found that measures of world capacity are not significant when added to the Phillips curves that they use to forecast inflation, and that the usual measures of domestic labor and product market slack retain their significance.

As I mentioned at the outset, I probably attach more weight than would Bill to effective monetary policy in explaining why inflation was tamed in the 1980s and 1990s and why it has remained low since then. So let me turn to the two problems that Bill cites concerning the role of monetary policy in explaining the stylized facts about inflation. First, Bill said he was puzzled that such a diverse set of countries have appeared to be so successful in bringing down inflation through greater monetary policy credibility. I don't find it so puzzling.

The policy shift was in part a response to earlier adverse experiences with high and variable inflation in industrial countries in the 1970s and in many emerging markets through the 1980s. Governments in the industrial countries, including the U.S., reacted

[9] Claudio Borio and Andrew Filardo (2007), "Globalisation and Inflation: New Cross-Country Evidence on the Global Determinants of Domestic Inflation," BIS Working Paper 227, May http://www.bis.org/publ/work227.pdf?noframes=1.

first by strengthening institutional frameworks to foster monetary stability. For example, some industrialized countries, such as New Zealand, Canada, and the UK adopted explicit inflation-targeting regimes. Others, like the US, Germany, and Japan, have used less formal, but still forceful, means to convey the significant weight they place on low inflation. Still others, such as the Southern European countries of Portugal, Italy, Spain, and Greece, succeeded in lowering inflation to meet the conditions of joining the European Monetary Union.

The later shift to lower-inflation policies in emerging market economies occurred in part because they could take advantage of low foreign inflation, in part because they could learn from successful policies elsewhere, and in part because of public dissatisfaction with inflation. Globalization of capital markets probably also strengthened the commitment of emerging market policymakers to macroeconomic stability. These countries' interest in attracting capital inflows coupled with their recognition of the potential macroeconomic damages resulting from capital flight must surely have disciplined the conduct of monetary policy. As Bill pointed out, their approaches differed. Some emerging markets first stabilized inflation by creating currency boards and credibly pegging to foreign countries; here Hong Kong in 1983 and Argentina in 1991 come to mind. Others stabilized inflation by pegging temporarily before allowing more exchange rate flexibility, as in the case of Israel in the mid-1980s and Brazil in the mid-1990s. More recently, some emerging markets have adopted inflation-targeting frameworks to provide nominal anchors: Korea in 1998, Brazil and Mexico in 1999, and Thailand in 2000 are examples.

Second, Bill said he was puzzled about why inflation has not been higher in recent years, given what he regards as accommodative monetary policies in many countries, that is, low real interest rates, rapid growth of money and credit, booming asset prices, and policy rates significantly below levels implied by Taylor rules.

I frankly don't consider this much of a puzzle at all. The stance of monetary policy must be judged not on the basis of money and credit growth but rather on the level of the real policy interest rate compared with its neutral or equilibrium value. That value can vary over time and, in my estimation, it was quite low in the United States and many other industrial countries following the bursting of the tech bubble, the collapse in investment spending, and the 2001 recession. Indeed, the Federal Reserve worried in 2003 about the possibility of deflation and the prospect of hitting the "zero bound," a situation that research shows is best avoided by cutting rates early and substantially. A decline in the estimated equilibrium real rate coupled with a desire to use policy aggressively to avoid the zero bound, explain why, in the United States, the policy rate may have fallen below levels implied by Taylor rules. As Bill details, many emerging market economies experienced a savings glut, or more accurately, an investment drought, in the aftermath of the financial crises of the late 1990s and the subsequent tech bust. Such drags on aggregate demand necessitated low real interest rates to offset them, and the boom in housing, which occurred not only in the United States but around the globe, provided an offset to restraint in other components of aggregate demand.

During the past few years, strong global growth has diminished slack in labor markets around the world and pushed up energy and commodity prices. From the U.S. standpoint, whatever tailwinds may have resulted from falling non-commodity import prices waned as the dollar declined. Even so, core inflation in the United States and most other industrial countries has remained reasonably well contained. Bill credits supply-side factors associated with both domestic deregulation and globalization in holding down inflation. I consider it a mistake, however, to downplay the role of monetary policy, in particular its credibility. In the U.S. case, it is the credibility of monetary policy that, in my view, has helped to insure that the inflation shocks resulting from energy, food, materials, and exchange rates do not spill over into inflation expectations and wage setting, and thus have only transitory effects. Credibility accounts for why inflation appears generally to have become less persistent. Households and firms believe that such shocks will not be allowed to feed into further increases in inflation, so inflation expectations have become better anchored. Indeed, much research documents that movements in energy prices have had far smaller effects on core inflation since the mid-1980s, and the most compelling reason for this shift is the credibility of monetary policy.

Let me conclude by looking forward, offering my personal assessment of where domestic inflation is heading in the U.S. Recent inflation performance has certainly been disappointing and the disappointments stem largely from strong global headwinds. Rising food and energy prices have boosted the total PCE price index by 3.7% over the past 12 months and 5.4 percent during the past three. Excluding food and energy, the core PCE price index is still up 2.2 percent over the past 12 months, an outcome that partly reflects pass-through from the drop in the dollar. Even so, I expect both total and core inflation to moderate over the next few years, edging down to under 2 percent, an outcome that is broadly consistent with my interpretation of the Fed's price stability mandate. And I see the risks to this outcome as roughly balanced.

My forecast of moderating inflation assumes that labor compensation will continue to grow, as it has in recent years, at a reasonably modest pace. This in turn assumes that inflation expectations will remain well-anchored, as they have been, and also that workers will not through their bargaining offset the real losses resulting from higher food and energy prices. It importantly assumes that energy and food prices will stabilize near their current levels so that the inflationary impetus from these sources will dissipate over time. Bill rightly points out that these assumptions cannot be taken for granted. Rising food and energy prices have lowered the purchasing power of the median worker and, as Bill comments, some “pushback” could occur. The expectation that energy prices will stabilize near their current levels is consistent with futures prices, but such expectations have been dashed many times over the past few years. With respect to inflation expectations, Bill rightly cautions that “the experience of past errors should not be forgotten today when it is once again being suggested that inflation expectations are sticky (now at low levels).” I agree that the Fed certainly cannot afford to take for granted that inflation expectations will remain well-anchored.

At the same time, there are downside inflationary pressures relating to the slowdown in the U.S. economy. Bill notes, and I agree, that the U.S. economy is particularly exposed to downside risks from the unwinding of the housing bubble and disruptions in financial markets. There is some slack now in the U.S. labor market and, if these downside economic risks materialize, quite a bit more slack could emerge. Even with a flatter Phillips curve, such a development would place some downward pressure on inflation. It is this unpleasant combination of risks to both inflation and employment that the FOMC must balance as it assesses the appropriate path for monetary policy going forward.

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