PETRODOLLARS, GLOBALIZATION AND U.S. INFLATION

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ABSTRACT

This paper evaluates the theoretical and empirical evidence that bears on the question of whether globalization and petrodollars recycling contributed to significant changes in inflation performance in the U.S. We assume that the impact of globalization can be direct and indirect. Direct impact is through the cheaper imported goods to the U.S. as a component of Consumer Price Index. Indirect impacts are through the effects on wage, cost of capital, and inflow of funds including the petrodollars and the impacts of price of competing goods. Data for analysis are compiled from the Department of Commerce and the International Monetary Fund (IMF) for period of 1990-2005. Our findings suggest that, under current circumstances, globalization could have only a modest disinflationary effect on U.S. inflation. However, if some fundamental factors, such as these countries' exchange rates, demand and wage change (i.e. increase), then the downward pressure on U.S. inflation will be decreased. The flow of workers from emerging economies to competitive labor markets will slow down. The downward pressure on rich-world wages and prices will lift, and globalization will become an inflationary force instead.

JEL: E24, E29, E31, F14, F16

KEYWORDS: globalization, inflation, Consumer Price Index, petrodollars, International Monetary Fund

INTRODUCTION

In the decades that followed the two world wars, the Great Depression, and protectionist policies seemed to bring economic integration to an end. If we look back to post- World War II period, the external sector of the U.S. economy had a smaller overall impact on macroeconomic policy than it does today. Exchange rates for the dollar with respect to major currencies were fixed in a system in which the United States enjoyed the "exorbitant privilege" of being the reserve currency (Kohn, 2005).

The recovery of trading partners from WWII, the development of sophisticated financial markets, the growth of trade, and the desire of other countries to pursue policies independent of Unites States brought about changes in the exchange rate system. In the early 1970s, U.S. shifted from fixed exchange rates under the Bretton Wood system to the present managed float arrangements, in which the dollar's value against major currencies is set by the market forces. These changes, along with advancement of technology and steady trends toward greater openness, have integrated U.S. economy with the rest of the world. Hence, the U.S. economy is now directly affected by foreign development and global integration. Developments in ocean shipping have also facilitated the latest wave of globalization, e.g. larger and faster vessels and containerization of their cargoes. These developments (ocean shipping and containers) are not recent. However, offshore outsourcing is a recent development, which has globalized the U.S. economy further. These development combined with state-of-art logistics have significantly lowered the costs of international transactions.

The first stage of globalization began with the collapse of the Soviet Union and German unification in 1990. That was followed by the following events: Eastern Europe opening itself up for businesses, Latin America embarks on privatization, India emerging from its 1991 financial crisis, and China gaining traction after opening up in the 1980s. The second stage of globalization was characterized by the

maturing of places like China, India and Eastern Europe and their integration into the global economy. The barriers among countries have been largely eliminated among high-income countries and have been significantly lowered in middle-income countries, too. Billions of dollars of funds can move instantaneously among countries at the touch of a computer key (Thompson, 2007).

This paper evaluates whether globalization and petrodollars recycling contributed to significant changes in inflation performance in the U.S. We will study theoretical and empirical evidence to evaluate the question above. We look at both direct and indirect impact of globalization as follows: direct impact is through cheaper imported goods to the U.S., measured as a component of Consumer Price Index; indirect impact is felt on wages, cost of capital, inflow of funds (including petrodollars), and the price of competing goods. We analyzed data obtained from the U.S. Department of Commerce and IMF for the period between 1990 and 2005.

The remainder of this paper is organized as follows: In the next section, we discuss the economic setting to provide a context for our work. We concentrate on capital flow, recycling petrodollars and wage effect in the economic setting section. After this section, we present relevant literature with a particular focus on the gains from trade. Then we examine how foreign countries affect U.S. inflation. We specifically explore capital flow, wage effects and the trade and exchange rate. Finally, we present our findings and analyze them. We conclude by proposing guidelines and providing recommendations for future actions.

ECONOMIC SETTING

Since the decades following the two world wars, advanced technology and changes in policy have worked together to integrate more nations and unify them. The U.S. economy has advanced considerably over the last three decades, with more than triple the variety of international goods available to American consumers along with a wealth of technological and sophisticated new products at reasonable prices. The 2005 ratio of trade to Gross Domestic Product (GDP) has approached 27% (International Financial Statistics, IMF, 2006), its highest point in at least a century.

Availability of new goods and varieties through international trade has affected the welfare of U.S. citizens in a positive manner. Improved transportation technologies have reduced the cost of moving products. Improved communications and information technologies have facilitated international commerce, particularly in services. They have also underpinned the rapid financial market developments and contributed to the massive gross inflows of financial capital. From 1992 through 2007, foreign investors' of holdings of U.S. financial market debt securities outstanding increased 575 percent, from $989.3 billion to $6,681.7 billion (Federal Reserve Board, Flow of fund Accounts Releases)

Some economists argue that U.S. economy is still "effectively insulated" from foreign competition, because imports and exports, respectively, only represents slightly over 10 percent of U.S. GDP (Krugman, 1994; Krugman, 1995). Here the argument is on the degree of openness or "globalization" of the U.S. economy. Whereas globalization is a widely used term, in fact its meaning is rather vague. It refers to the growing economic interdependence of countries worldwide through the increasing volume and variety of cross-border transactions in goods and services and of international capital flows, and also through the more rapid and widespread diffusion of technology (IMF, 1997). There is no doubt that the process has had an upward trend and it is inevitable unless some substantial policy changes take place.

As Gamber and Hung (2001) suggested, the increase in services – a mostly non-tradable sector – as a component of GDP means that the imports/GDP ratio underestimates the depth of U.S. reliance on imports. Goods imports, as a share of total goods purchased (by firms and households) shows a much sharper increase than imports/GDP ratio. Goods imports, which constituted less than 10 percent of U.S. goods purchased before mid-1970s, by 2000 represent over 30 percent of total purchased (survey of

Current Business of the Bureau of Economic Analysis,) and such findings suggest that imports have become an increasingly important component of final demand for goods by the private sector. With higher demands for imported goods, the changes in import prices have not only directly affected U.S. consumer prices but also indirectly affected competitive pressures on domestic producers so as to adjust their prices in response to the changes in import prices.

Capital Flow

In addition to further exposure of the U.S. to foreign countries, the U.S. has become more globalized in terms of capital flows across its borders. The removal of regulations and barriers along with further economic growth in other countries allowed for more capital inflows and outflows across the U.S. border. U.S. private capital outflow, which was roughly about 3 percent of GDP ($140 billion) per year during the 1980s, increased to 9 percent of GDP ($700 billion) by 1997. Obviously the trend is toward greater capital inflow due to higher capital mobility and greater influence of foreign economies on the U.S. economy. Furthermore, direct investment abroad as a percentage of GDP increased from 13 percent in 1990 to 28 percent in 2004 (International Financial Statistics, IMF, 2006). These data suggest an increase in capital mobility due to increased inflows and outflows. This implies that foreign economic conditions will have greater influence on the U.S. economy. The implication of the further flow of capital is about the impact on U.S. interest rates as capital flow affects U.S. interest rates and hence the cost of capital.

The impact of further mobility of capital is not only affecting the U.S. but also other countries. A recent example is that the Reserve Bank of India (equivalent to the Federal Reserve in the U.S.) has been trying to combat excessive capital inflows (foreign direct investment and speculative real estate investment) from 2006. Some researchers argue that, when the capital inflow takes the form of foreign direct investment, it often improves access to international best practices in production, including managerial, technical, and marketing know-how. Therefore global investments such as trade, benefit both parties in the transaction. These benefits, in turn, can lead to higher real income and wages (Fernald and Greenfield, 2001).

Mishkin (2007) argues that we should expect substantial flows of capital from rich countries to poor countries and such capital flows could lead to substantial benefits for poor countries in the form of larger capital stocks, higher productivity and more rapidly growing incomes. Opening markets to foreign financial institutions promotes reforms to the financial system and these reforms improve the functioning of the financial system.

Recycling Petrodollars

After the OPEC oil embargo of 1973, oil prices jumped from an average of slightly less than $4.00 a barrel to $11.40 a barrel in 1974 (or in 2005 dollars, oil price increased from $16.75 to $45.40 a barrel). This was the first major oil shock to the U.S. economy. The second major oil shock was in 1979-80 with the Iranian Revolution pushing oil prices from approximately $14.00 a barrel to $37.20 a barrel in 1980 (or from $41.95 to $88.25 a barrel in 2005 dollars). The third episode of oil price volatility occurred gradually and oil prices that averaged just $25.00 a barrel in 2003 climbed modestly in the same year. In early 2004, the price of crude oil had strong upward trend averaging $37.66 a barrel that year, $50.04 in 2005 and $64.2 by 2007 (Bureau of Economic Analysis, Bureau of Labor Statistics).

The three episodes of price volatility generated large swings in export revenues for oil-exporting countries. Oil revenues increased from $24 billion in 1972 to $117 billion in 1974, $275 billion in 1980, and $250 billion in 1981. A significant increase occurred in 2002-2006 with oil revenues increasing from $300 billion to $970 billion. This increased the savings of oil exporters from roughly 28% of GDP in 2003 to 39% of GDP in 2006, without much increase in investment. Tracking petrodollars is difficult

because other major countries besides the U.S. do not report details of financial transactions with oil exporters. Also, the revenues of oil exporters could be deposited in another country and then be used to purchase U.S. assets. Since finances flow from another country besides the oil exporter countries, tracking the original source of funds entering into the U.S. is a difficult challenge. Given the complication of this portion of the study, we rely on limited data to justify that the increase in savings for oil exporter countries has been allocated for the purchase of foreign assets directly or indirectly (see Table 1).

Table 1: Global Current Account Balances, in Billions of U.S. Dollars

	2002	2006	Change
Surpluses			
Oil exporters	88	571	483
Emerging Asia	122	263	141
Japan	113	167	55
Western Europe	57	13	-44
Deficits			
United States	-472	-869	-397
Other countries	-59	-130	-72
Global Discrepancy	151	-16	-167

Sources: International Monetary Fund (IMF) and www.newyorkfed.org/research/current_issues

Oil exporters have two options to utilize their oil revenues: import more goods and services or purchase foreign financial assets in international capital markets. It is estimated that, out of export revenues of about $980 billion in 2006, just under half or about $475 billion has gone to increase imports of foreign goods and services. Another $485 billion has gone to increase net purchases of foreign financial assets (Higgins, Klitgaard, and Lerman, 2006). The U.S. deficit is projected to reach almost $870 billion in 2006, up roughly $400 billion from 2002. Thus, the U.S. has been the only major economy willing to take on sizable foreign liabilities during the period of rising oil prices. As indicated in Table 2, the increase in net financial inflows to the U.S. roughly matches the increase in net outflows from oil exporters.

Indirect petrodollar recycling should also have an effect on interest rates, exchange rates and other asset prices. As in most oil producing countries, the oil industry is owned by the state, mostly through central bank purchases of foreign exchange reserves. As a result of this strategy, the major player is the official sector in petrodollar recycling, as shown in Table 2.

Table 2: Net Foreign Investment of Oil Exporters, in Billions of U.S. Dollars

	2003	2004	2005	2006	Total
Net Foreign Investment	138	217	385	571	1,311
Private Investment	22	33	40	81	176
Official Investment	116	184	344	490	1,134
Foreign Exchange Reserves	72	126	213	245	655

Sources: International Monetary Fund and www.newyorkfed.org/research/current_isues

Wage Effect

Another way that globalization affects the costs of production is through the increase in global labor force and further outsourcing. Global outsourcing reduces supervisory and administrative expenses, lowers effective wage rates through the use of offshore workers, and eliminates payment for nonproductive time and workers' benefits (such as health insurance, liability insurance and workers' compensation), and reduces operating costs. Some research suggests that this depresses wage rates for remaining workers and creates fewer job opportunities in many occupations (Ansberry, 2003b; Ansberry, 2003c). Another issue is changing technology and trade patterns that put high-skilled workers in increasing demand, thereby

reducing the demand for less-skilled workers. Skilled workers are enjoying rapid wage increases, but unskilled workers have had very slow wage rises in recent years due to the wage effect detailed above.

REVIEW OF LITERATURE: GAIN FROM TRADE

Classical international trade theory postulates that opening an economy to trade improves welfare by allowing consumers to have access to cheaper products and a wider range of goods than consumers in closed economies. The assumption is no single country can produce all the goods available in the world. According to this model, most gains that are accrued by trade are measured directly by the number of variables.

Globalization involves increasing integration of economies around the world, from national to local levels, hence promoting not only trade among nations but also movement of technology, information, investment and people. Studies have shown that when a country engages in international trade, the real purchasing power of its households rises because they can obtain goods and services at lower cost than what they were used to purchasing (Thomson, 2007). Also, when a country engages in international trade, it can produce products from its land, labor and capital because it is not using them to produce something that can be produced in another country at lower resource costs (Ibid). Through this process, industries rise and fall and rise in other countries at a very rapid rate. What is clear is that one of the great benefits of globalization is the manner in which it increases wage rates and purchasing power in previously low-income countries. This has happened over and over again in the past half century (Ibid).

Not all agree that globalization is working for everyone. Stagnating wages and rising job insecurity in developed countries are creating popular disenchantment with the free movement of goods, capital and people across borders. This group argues that, in theory, less-developed countries win from globalization because they get jobs making low-cost products for rich countries. Rich countries win because, in addition to being able to buy inexpensive imports, they also can sell more sophisticated products like machine tools or financial services to emerging economies. "The first win is there, but the second win is going to the owners of capital rather than labor," (Roach, 2002). As a result, an ever-larger share of national income in the U.S., Japan and Western Europe is going to company profits. The share that flows to workers is dwindling. Many companies in the U.S. and Europe are threatening to move production abroad and, as a result, real labor incomes in the U.S. have grown at roughly half the rate of labor productivity (Roach, 2002a).

In addition, business executives and others have long hailed globalization's anti-inflation impact, but economists don't consider it to be a clear-cut case. There have been some studies measuring the welfare gains of globalization from global variety growth. Broda and Weinsein (2005) find that the value to consumers of global variety growth in the 1972-2001 period to be roughly $260 billion. They assumed the number of domestic varieties remains the same when the number of imported varieties increases. This estimate of gain from trade was much larger than the previous findings of Feenstra (1992) and Romer (1994) where they measured gains from eliminating protectionism.

In the late 1990s, both unemployment and inflation were falling in the U.S. Typically, falling unemployment fuels wages and thus, higher prices. Many economists concluded that information technology had triggered acceleration in productivity and contributed to price stability despite a rapid growth of GDP. In the years 2002-2005, with productivity growth leveling off and unemployment declining, economists including Alan Greenspan have fingered globalization as a missing variable that contributed to lower inflation in the U.S.

The integration of the former Soviet Union, China and India into world markets would "approximately double the overall supply of labor," (Greenspan, 2005) and prove a major contributor to the

disinflationary pressures that have been evident in the global economy. Federal research suggested that low import prices may have knocked one-half to one percentage point off the underlying inflation rate in the past decade (Kohn, 2005). How much of that decline was because of the strong dollar and increased manufacturing efficiency in the U.S. and abroad, and how much of it was due to globalization, is an empirical question.

Another study estimates that growing imports from China have cut U.S. inflation by at most 0.1 of a percentage point in recent years (Kohn, 2005). Moreover, many workers are now facing the greatest growing pressure for wage and benefit cuts in industry due to foreign competition. Ansbeny (2003b) notes that wage growth in services industries rose to 3.2% in 2005 from 2.7% in 2004, but in manufacturing, the sector most exposed to global competition, wage growth actually fell to 2.3% in 2005 from 2.6% in 2004. Often the mere threat that production may move overseas is enough to trigger wage concessions. Thus such "threat effect" has pressed wages and benefits down.

According to Kohn (2005), globalization has widened product choice everywhere and lowered costs to consumers by improving the global allocation of resources and moving factors of production, such as workers, into their most effective uses. More concerns about globalization arise from the potential consequences of adding these workers to the global network of production and distribution. Initially, low wages reflected their low productivity under the rigid economic and political systems they were saddled with. However, as they became more productive by acquiring more capital, training and the freedom to make choices, their real wages were expected to rise on an average. With the introduction of large numbers of new workers into the global economy, we would expect to see downward pressure on the compensation of low-skilled workers in developed nations. At the same time, prices of goods and services imported from newly industrialized economies should decline relative to the prices of the products they purchase from the U.S., effectively raising the real incomes of U.S. citizens.

Several observers have argued that increased trade has been an important factor in the downtrend in inflation over the past two decades (Greenspan, 2005) and (Rogoff, 2003). One channel is through greater competitive pressures and another is through increased support for price stability engendered by the competitive environment. Globalization might restrain prices and wages in those sectors in which imports play an increasing role, but how does it hold back the average wage and price level? And how can we reconcile the sense of greater competitive pressures with record levels of profits – and capital income more generally – in the United States?

The view that China's exports surge has contributed critically to the decline in global inflation, and to the risk of global deflation, is not universally shared (Anderson 2002 and Noland and Posen (2002). Critics of this view argue that it is unlikely for China to have a pronounced deflationary effect on the global economy. As large as China's economy is in dollar terms, and as rapidly as it has grown, it still accounts for only 5 percent of global exports and GDP; therefore, it seems unlikely that China could restrain global activity and prices much by itself. Roach (2002a) referred to Asia as "as exporter of deflation to the rest of the world and China is leading the way." He found out that, among other factors, since the share of imports from China in the U.S. GDP is relatively low, these imports are unlikely to impact the general price level by much.

While some research (IMF, 2003) has looked into impact of China's CPI inflation on foreign inflation, it is generally understood that it is China exports and export prices that are most likely influencing foreign prices. Anderson (2002) provides a broad-ranging and insightful analysis of China's impact on foreign activity and prices, but does not provide estimates of aggregate effects. Young (2003) takes a general look at China's impact on prices in Japan, but does not come up with estimates of the effect. Kamin, Marazzi and Schindler (2004) found out that China's share of U.S. imports since 1993 has lowered the share of import price inflation by about 0.8 percentage point per year; given the relatively low share of

imports in the U.S. GDP, however, the ultimate impact on U.S. consumer prices has likely been quite small. They estimated that Chinese exports lowered average annual import unit value inflation in the largest set of economies since 1993 by about 1/10 to 1/4 percentage point, and by 1 percentage point in the U.S.

Gamber and Hung (2001) used data for 1987-1992 and found that import prices exerted a greater impact on prices of products in industries faced with greater import penetration. Their result suggests that increased globalization has helped prolong the U.S. expansion in 1990s by holding down inflation, thereby allowing the Federal Reserve in the U.S. to allow the economy to continue growing. But they caution against the view that globalization makes it possible for excess foreign capacity to help dampen U.S. inflationary pressure in the midst of a strong recovery. Furthermore, they argue that high foreign excess capacity accounts for much of the decline in U.S. inflation of the 1990s.

Krugman (1994, 1995) and Irwin (1996) have looked at whether the United States has become more globalized over the past decade. They find that trade with the rest of the world is not a significant or rapidly growing influence on the U.S. economy. Swagel (1997) investigated whether prices of foreign goods influenced domestic prices through the competing goods effect. He found a statistically significant but small impact in 10 of the 19 industries in his sample. Slaughter and Swagel (1997) found that increased globalization had a modest impact on wages of workers in industrial countries. Tootel (1998) investigated the impact of foreign capacity utilization on U.S. inflation and found very little to no impact of foreign capacity utilization on domestic inflation. Kohn's (2005) study found out that the decline in import prices since the mid-1990s has shaved between 1/2 and 1 percentage point off core U.S. inflation over the past ten years.

Andrea Pescatori (2008) examined in her study the reasons behind most of the moderation in inflation that occurred in industrial countries since the 1980s. Three explanations have been offered for the moderation in real GDP and inflation: good luck, better monetary policy, and structural change in the economy. In terms of luck, stable oil prices helped produce calm waters, because so many of the industrial countries import their oil since their output requires oil as an input for production. Higher prices for oil will affect output and prices. Changes in the price of oil are considered supply shocks and affect both labor and capital productivity. Therefore, oil price increases lead to less output, and, if money supply is held constant, higher prices for consumer goods. Empirical work of the 1980s supports this argument. James Hamilton observed that every postwar U.S. recession but one has been preceded by an increase in the price of crude oil, and he asserted a casual relationship between oil price and GDP by comparing the actual GDP growth with the amount GDP without any oil shock.

Studies after the 1980s produced mixed evidence. Mark Hooker found that after 1981, increases in oil price had a smaller effect on GDP than before 1981. In addition, Olivier Blanchard and Jordi Gali documented an important change in the transmission mechanisms of oil shocks to economic activity and inflation in most industrialized countries. In particular, they found that the correlation between oil prices and U.S. GDP over the past 10 years had not been negative, but positive. This was because oil became a less important input to production than it was three decades ago, thus increases in its price affected the productivity of labor and capital less than before. As a result, the relationship between oil prices and economic activity is likely to look less strong.

Pescatori studied the volatility of oil price and its impact on GDP and inflation in different periods. She compared the period 1965-1983 to the period 1984-2006. She then calculated variability by using standard deviation multiplied by 100 and discovered that real oil prices in the latter period are less volatile than the former period by about 20 percent (see Table 3). That, in turn, indicates that the U.S. economy has reduced its reliance on oil considerably. She found out that this structural change has contributed to the U.S. economy's ability to insulate itself relatively well from oil-industry related shocks. The

reduction of the oil-GDP ratio, from 0.036 in 1965-1983 to 0.022 in 1984-2006, accounts for about 10 percent of the moderation in GDP growth volatility and 25 percent of the moderation in inflation volatility. In this paper, we hypothesize that globalization, through changes in oil price, will not have a major impact on inflation by itself.

Furthermore, while today's high price of oil of more than $100 a barrel may seem to spell the end of these good times, the percentage change in recent oil prices has been much less abrupt than in the 1970s. In the 1970s, the skyrocketing price of crude oil was accompanied by double-digit inflation rates and deterioration of GDP growth in the United States and many other industrial countries. Today, the change in price of oil is caused by change in demand and supply; therefore, it is not accurate to interpret every oil-price increase as a negative shock to the U.S. economy. When we assume that oil prices change in response to other economic factors, such as higher global economic growth, technological and financial innovations, we can say that such shocks have had a positive impact on world growth and, thus, energy demand, and will generate a positive co-movement of GDP and oil prices.

Table 3: U.S. Economic Volatility Since 1965

	Variability 1965:Q1-Q4	Variability 1984:Q1-Q4	Variability Reduction
GDP Growth	1.126	0.508	55
Inflation	0.609	0.244	60
Interest rate	0.847	0.583	31
Real oil price change	16.33	12.99	20

Source: Nakov and Pescatori, 2007

EMPIRICAL ANALYSIS

This paper utilizes data from 1980-2005 to assess the impact of import price on U.S. inflation. We assume that import prices have influenced domestic inflation in two different ways. The first way is through competition with imported goods, which made it difficult for domestic producers to raise their prices. Here we assume that imported goods and domestic products are perfect substitutes for one another. The second manner in which import prices have influenced domestic inflation is through the impact of cheap imported raw material on costs, and thus on the finished product prices of U.S. goods and services. We consider this effect via the following equation: the U.S. consumer price (P) is a weighted average of two components – the dollar price of imported goods (P^{im}), and the price of other goods and services that are non-imported (P^{ot}).

$$P = \alpha P^{im} + \beta P^{ot}$$

In the equation above, α and β represent the shares of imported and non-imported goods respectively. We assume that domestic prices are set based on marginal cost pricing, which is a function of the cost of capital, unit labor cost and cost of imported inputs. Thus, price of non-imported goods (P^{ot}) also depends upon several factors as shown in Equation (1) below: the cost of capital (i), unit labor cost (w), and the price of imported raw materials (P^{rm}) (excluding energy). X represents other factors that could influence P^{ot}.

$$P^{ot} = f(i, w, P^{rm}, X) \quad (1)$$

$$P^{ot} = \beta_1 i + \beta_2 w + \beta_3 P^{rm} + X \quad (2)$$
$$\beta_1 > 0 \quad \beta_2 > 0 \quad \beta_3 > 0$$

$$P^{rm} = f(CU^f) \quad P^{rm} < 0 \quad (3)$$

$$P^{ot} = \beta_1 i + \beta_2 w + \beta_3 P^{rm} + \beta_4 CU^f + X \quad (4)$$

Equation (2) above represents the increase in increase P^{ot} due to an increase in the cost of capital (i). The U.S. consumer price, P will also increase by increasing the marginal cost. An increase in wage (w) and P^{rm} will increase P^{ot} and P by raising the variable costs of production. We also assume that falling import prices could result in lowering the unit labor cost of domestic firms.

Equation (3) above represents the impact of foreign capacity utilization (CU^f) on import price (P^{rm}). In this paper, foreign capacity utilization is measured based on the deviation of GDP from estimates of the potential GDP of the major trading partners of the U.S. Foreign capacity utilization is assumed to affect the prices of foreign goods. Foreign goods prices, then, help determine U.S. import prices. In addition, U.S. import prices may affect U.S. inflation both directly and indirectly as represented by Equation (4) above. As import prices fall, the U.S. consumer price will fall directly by the proportion of α. Moreover, as interest rate, wage and price of raw materials fall, we will observe indirect impacts on U.S. consumer price. This is represented by the second, third and fourth terms in Equation (4) above. Throughout the direct and indirect effects, a decrease in import prices will dampen U.S. inflationary pressure and keep the U.S. economy in an expansionary period.

For Equations (1), (2), and (3) above, OLS is going to be used. However, in order to have a more complete model, it might be a good idea to run OLS on the estimated values of P^{rm} and P^{ot} obtained from step 1. Therefore, we could also use a three-stage least square method; then, we only need to be careful about the standard error adjustment.

Table 4: Goods Imports Relative to Total Demands for Goods, in Billions of Dollars

Year	Personal consumption expenditures	Imports of Goods	Imports/total consumption	Other goods
1990	3839.9	630.3	16.4%	83.59
1991	3986.1	624.3	15.7%	84.34
1992	4235.3	668.6	15.8%	84.21
1993	4477.9	720.9	16.1%	83.90
1994	4743.3	814.5	17.2%	82.83
1995	4975.8	903.6	18.2%	81.84
1996	5256.8	964.8	18.4%	81.65
1997	5547.4	1056.9	19.1%	80.95
1998	5879.5	1115.9	19.0%	81.02
1999	6282.5	1251.7	19.9%	80.08
2000	6739.4	1475.8	21.9%	78.10
2001	7055	1399.8	19.8%	80.16
2002	7350.7	1430.3	19.5%	80.54
2003	7709.9	1546.5	20.1%	79.94
2004	8214.3	1797.8	21.9%	78.11
2005	8745.7	2027.7	23.2%	76.81

Source: Bureau of Economic Analysis

Table 5: Percentage of Goods Imported from Major Trading Partners into the U.S., 1990-2005

Year	China	Western Europe	Japan	Canada	Mexico
1990	5.4	38.3	17.1	29.2	10
1991	6.6	35.6	16.7	29.6	11.5
1992	8.2	35.2	15.2	28.6	12.9
1993	9.4	34.7	14.2	29.7	12.4
1994	10	33.7	13.8	29.4	13.1
1995	10.7	34	15	29.5	10.8
1996	11.1	33.8	14.5	28.5	12.2
1997	12	33.1	12.6	28.7	13.7
1998	12.8	34.6	10.4	27.8	14.3
1999	13.6	35.3	9.5	27.2	14.4
2000	14.4	34.7	9.4	25.4	16.1
2001	15.4	36	8.7	24.6	15.3
2002	18.4	36.2	7.6	23.6	14.3
2003	20.7	36.1	7.1	23	13.2
2004	23.2	35.1	6.4	22.3	13
2005	25.5	34.1	5.8	22.1	12.6

Source: Bureau of Labor Statistics, U.S. Department of Labor

Table 6: Variables Being Used in Analysis

Variable	Explanation
Dependent	
P	Inflation rate (Percentage change in CPI)
P^{ot}	Price of non-imported goods – GDP deflator (Percentage change)
Independent	
P^{im}	Price of Imports – Import Price Index (Percentage change)
P^{ot}	Percentage change in non-imported goods and services – GDP deflator
I, ,	Interest Rate – Long-term rate (Cost of capital)
w	Unit Labor Cost – Manufacturing Wage rate (Percentage change)
P^{rm}	Price of raw-materials – Non-fuel commodity price index
CU^{f}	Capacity Utilization rate – GDP Gap

THE IMPACT OF FOREIGN TRADE ON U.S. INFLATION

There are different ways that trade with other nations can influence U.S. inflation:

Capital Flow Channel

Due to the high savings rate in other countries, their citizens search for a high rate of return on their savings. If they find out that U.S. real rate of interest is higher, then foreign capital will flow to the U.S. This inflow of capital (higher supply of loan-able funds) can put downward pressure on U.S. long-term interest rates and push up the security prices, thereby lowering the cost of capital. The decrease in cost of capital will enhance further investment and hence productive capacity, helping lower long-term marginal costs of production. This will help dampen the pressure on P^{ot} even if the U.S. economy is in an expansionary period.

Wage Effect

There are several factors affecting the bargaining power of the U.S. in wage negotiations. Deregulation and less restrictions on mobility of capital and investment, weakening of labor unions and further outsourcing, have contributed to the better bargaining power of U.S. firms in wage negotiations. U.S. firms can choose to move their production abroad and take advantage of lower wages there. This will lower the unit costs and in turn help mitigate the inflationary pressure coming from rising labor costs.

Trade and Exchange Rate

The U.S. higher real rate of interest attracts more capital inflow and hence affects the value of the dollar. A stronger dollar will lower import prices and lower U.S. consumer prices. In addition, falling import prices can lower domestic prices, as U.S. firms will have to either enhance productivity or accept lower profit margins to stay competitive. It has been argued that U.S. producers cannot raise their prices even when cost pressures begin to appear, because doing so when foreign prices remain moderate would seriously diminish their market share. Furthermore, the value of the dollar can influence U.S. net exports, imports and domestic inflation.

Foreign Capacity

Foreign capacity affects U.S. inflation through its effect on foreign inflation. Deviation of GDP from estimates of its potential level is used as a measure of excess capacity in the major trading partners of the U.S., such as China, Japan, Canada, Western Europe and Mexico.

OUR FINDINGS

The following reports the coefficient estimates of equations (1-4). Standard errors are presented in parentheses below the parameter estimates. Our findings show a positive but not statistically significant relationship between domestic inflation and import price inflation, with R- square of 95.9683%. The F-statistic was 154.723 and we had a total of 26 observations. With β coefficient of 1.11 indicates that a 1% increase (decrease) in average import price leads to 1.1 percent increase (decrease) in domestic price inflation. Our findings did not support the role of foreign capacity utilization, on import price as the relationship between dependent and independent variable was negative and insignificant.

One reason is that China GDP gap was not available and we only used average of other trading partners. Then we included capacity utilization as an explanatory variable in equation (4), then it shows greater impact through other channels such as capital flow channels and wage effect, besides import prices but still it was insignificant. Another possible explanation that globalization did not have major impacts on U.S. inflation could be due to structural changes in U.S. economy and better use of monetary policy. Recent research finds that better monetary policy explains most of the moderation in inflation. The less intensive use of oil (a structural change) has also played a major role in the moderation of inflation.

In short, under current circumstances, the globalization could have only a modest disinflationary effect on U.S. inflation. However, if some fundamental factors changes then the degree of downward pressure on U.S. inflation will be less. Factors such as appreciation of trading partners' exchange rates, increase in demand, increase in commodity price and wage rate, then all of these will reduce the degree of downward pressure on U.S. inflation, as it has been noticeable in recent years. Recently, not just oil prices but also commodity prices have become higher; commodity prices are at a 200-year high and raw materials of all kinds are increasingly dear. Agricultural produce is now so expensive that developing countries face a growing political problem of how to respond to food inflation. These pressures will surely at some point end the era of low inflation that has under girded global prosperity.

$$P = -1227.5789 + 48.9257\,P^{im} - 26.4143\,P^{ot} \quad (1)$$
$$(183.9193) \quad (12.9529) \quad (11.3138)$$

$$P^{ot} = -323.2508 + 9.3996\,I + 0.2778\,w - 0.1555\,P^{rm} \quad (2)$$
$$(299.3565) \quad (5.3501) \quad (0.1909) \quad (4.8737)$$

$$P^{rm} = 94.8281 - 4.6335\,CU^{f} \quad (3)$$
$$(1.1963) \quad (0.9609)$$

$$P^{ot} = -323.2508 + 9.3996\,I + 0.2778\,w - 0.1555\,P^{rm} - 10.9969\,CU^{f} \quad (4)$$
$$(299.3565) \quad (5.3501) \quad (0.1909) \quad (4.8737) \quad (23.6255)$$

CONCLUSIONS AND RECOMMENDATIONS

One of the challenges in the U.S. is the education system, which is not flexible enough for the fast changing global environment. One strategy is to have a better education system from preschool onward to prepare global ready graduate. A short-term remedy is to have more assistance for workers who are laid off and are victim of globalization. Other support program can be retraining of workers who lose their jobs; a bigger role of public sector in the free market economy. In short, public policy should be directed toward overcoming the barriers, or transaction costs, to adjustments in the labor market. In other words, lawmakers must continue to commit to open global markets and free competition between markets for goods, services and financial flows. Meanwhile, they should develop policies aimed at helping workers remain competitive — for instance, grants and loans that can help keep workers trained and competitive. Workers need to enhance their skills often. Flexible retraining suggests that emphasis must be given to junior college and/or part-time skill development that can meet the evolving needs of employers. Public policy should recognize that the cost of maintaining human capital, as well as physical capital, is an ongoing investment.

Job-search issues also must be considered, given the "friction costs" associated with looking for that next position. The costs related to changing jobs increase quickly with the age of a worker, and remain high for poorly educated workers. Moreover, many workers have little recent experience looking for a new position, since they have worked in the same job for a number of years. Finally, unemployment insurance, which is built on the traditional view that unemployment is temporary and cyclical, fails to deal with the modern labor-market issues of permanent layoffs and obsolete skills. For this reason, the program should be reformed to recognize *structural* layoffs, and thereby allow for longer periods of unemployment that coincide with retraining, not just job placement.

Worker assistance, however, *does not* mean a handout at the expense of the taxpayers who are struggling with their own careers and personal responsibilities. Instead, programs that are developed to facilitate retraining and job-search issues should impress upon workers that they keep "skin in the game" if they expect to thrive in the age of globalization (Silvia, 2007).

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