Petrodollars, Asset Prices, and the Global Financial System

January 2007

Ramin Toloui

It is no secret that oil producers have reaped an enormous windfall from the surge in energy prices in recent years. And with painful memories of boom-bust oil cycles of the past, the recipients are saving the lion's share of the windfall this time. The result has been extraordinary, with oil exporters pouring well over $1 trillion into global financial markets since 2001.

Where is this tide of petrodollars going? *That* is more of a secret. Notwithstanding a growing number of high-profile acquisitions – like the contested purchase of P&O's global port operations by Dubai Ports World – the bulk of total oil savings are flowing into financial instruments, including bonds, equities, and bank deposits. Some funds are being managed directly by oil exporters, while others are being placed with external investment managers like PIMCO. All of these factors make oil investments exceptionally difficult to track.

Yet understanding petrodollars is fundamental to thinking about where international financial markets have been in recent years and where they are going. The governments of oil-producing countries are now the largest single source of global savings, surpassing Asian governments in 2005 and on track to add some half a trillion dollars in assets in 2006 alone, as shown in Figure 1.[1]

Decisions that oil exporting countries make about where to channel these funds affect not only the prices of key financial assets, but also by extension such variables as economic growth around the world, the ability of the U.S. to finance its current account deficit, and the sustainability of the so-called Bretton Woods II international financial regime.[2]

Reserve and Official Asset Accumulation

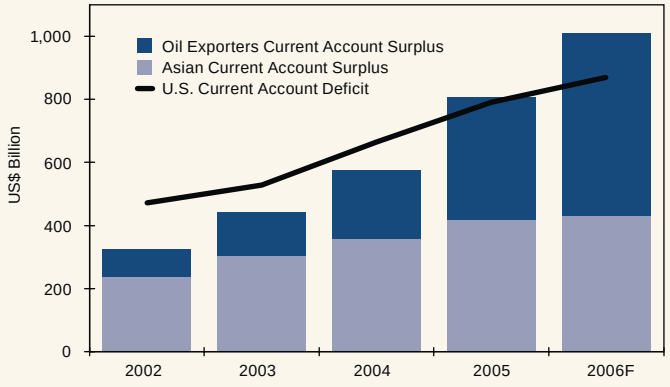
Source: International Monetary Fund, Haver Analytics

Figure 1

This note has two objectives. The first objective is to lay out as comprehensively as possible what we know and what we do not know about petrodollars – the volumes, the beneficiaries, and the assets being purchased with oil savings. In doing so, this note presents new information on the extent to which oil savings are accumulating in return-oriented sovereign investment funds versus conservative central bank reserves, derived from a detailed review of country balance of payments statistics. Much of the discussion about the impact of petrodollars on asset prices has been long on anecdote but short on numbers. This paper seeks to fill that void.

The second objective is to link these facts to a framework for thinking about the impact of petrodollars on global asset prices. This is inherently difficult – markets and economies are complex systems that adapt and change in ways that defy models that aspire to "hold all other things equal." As we shall see, however, a framework that uses available data on oil savings to draw inferences about the broader asset appetites of oil exporters can generate powerful insights into the behavior of asset prices over time. Even more importantly, such a framework provides a platform for assessing the *structural* impact of the rise of petrodollar savings on the operation of the global financial system.

Key Global Current Account Balances



SOURCE: International Monetary Fund

Figure 2

Petrodollar Savings: Who and How Much?

The tripling of crude oil prices from $20 per barrel at the beginning of 2002 to around $60 per barrel at the end of 2006 has turned oil exporters into a major force in international finance. The combined current account surpluses of oil exporters, which totaled $88 billion in 2001, are projected to reach about $577 billion in 2006, as illustrated in Figure 2.[3] From the perspective of global imbalances, consider that combined oil surpluses were equal to about 1/5th of the U.S. current account deficit in 2001 and was on track to be equivalent to about 2/3rds of the deficit in 2006. Ten of the top 20 largest current account surplus countries in 2006 are projected to have been oil exporters.[4]

Think of these current account surpluses as equivalent to the contribution that oil exporters are making to global savings. Because oil exporters are not spending all of their new oil revenues on imports, they have surplus funds

Accounting for Global Petrodollar Savings (2002-2005)

		Net Oil Exports (mbbl/d)	Cumulative Current Account Surpluses 2002-2005 ($ billions)	Type of Savings ($ billion) Central Bank Reserves	Investment Funds & Debt Reduction	Net Private Capital Outflows
1.	**Russia***	6.8	206.7	144.4	30.0	32.3
2.	**Saudi Arabia**	9.1	179.0	104.7	9.0	65.2
3.	**Norway***	2.8	137.5	15.8	85.1	36.6
4.	**Kuwait**	2.4	64.9	(1.5)	47.0	19.4
5.	**Venezuela**	2.5	58.2	14.8	18.5	25.0
6.	**Algeria**	1.8	46.0	36.9	-	9.1
7.	**UAE**	2.4	39.8	6.9	66.2	33.3
8.	**Nigeria**	2.6	39.4	17.8	9.0	12.6
9.	**Qatar**	1.0	24.3	3.3	11.1	9.9
10.	**Libya**	1.7	23.1	22.6	-	0.5
11.	**Iran**	2.4	19.8	29.5	-	(9.7)
12.	**Oman***	0.8	8.7	1.9	3.7	3.1
	TOTALS	**36.1**	**847.3**	**397.1**	**279.6**	**170.6**
	% of total savings			*47%*	*33%*	*20%*

* Non-OPEC producers.

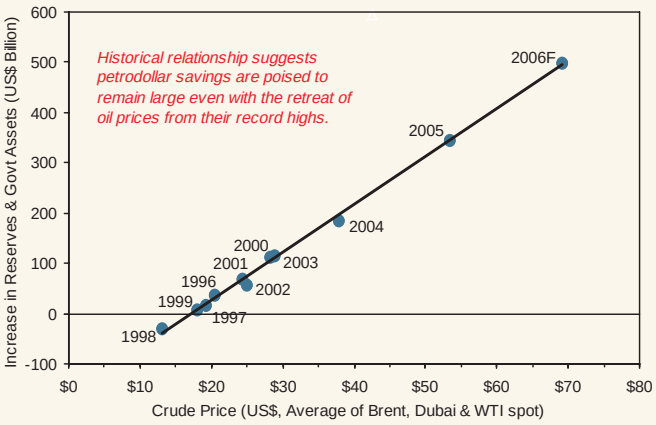
Source: PIMCO calculations based on IMF *International Financial Statistics*, Central Bank and Finance Ministry data. Net private capital flows include errors and omissions attributable to the statistical discrepancy.

Figure 3

(reflected in the current account balance) available for investment abroad. These savings are used to purchase a range of financial instruments all over the world. Therefore the cumulative current account surpluses of oil exporters over a period of time reflect the volume of petrodollar savings flowing into international financial markets.

The cumulative current account surpluses of the top twelve oil surplus countries between 2002 and 2005 totaled approximately $850 billion. Figure 3 presents the details on these surpluses and how they were used in each country, based on a review of the balance of payments statistics. A few important points emerge:

Reserve and Official Asset Accumulation vs. Crude Prices



SOURCE: IMF World Economic Outlook, PIMCO Analysis

Figure 4

- *Oil surpluses are highly concentrated.* The top three exporters – Russia, Saudi Arabia, and Norway – accounted for about 60% of the total. The twelve countries listed in the figure accounted for virtually all the combined global oil exporter surpluses.

- *"Petrodollars" means more than "Middle East."* Russia and Norway accounted for about 40% of cumulative current account surpluses. Adding Venezuela and Nigeria – OPEC members outside of the Middle East – raises that figure to about 50%.[5]

- *Governments capture the vast majority of oil savings.* About 80% of the cumulative current account surpluses in this period were used to build central bank reserves, add to sovereign investment funds, or repay government debt.

The last point is critical. Figure 4 shows that the relationship between crude oil prices and asset

Estimated Total Assets (as of mid-2006)

	In U.S.$
Abu Dhabi Investment Authority (UAE)	**$250 - 500 billion**
Bank of Russia Reserves & Oil Stabilization Fund (Russia)	**$260 billion**
SAMA & Government Institutions (Saudi Arabia)	**$250 billion**
Government Pension Fund (Norway)	**$170 billion**
Kuwait Investment Authority (Kuwait)	**$160 - 250 billion**
Qatar Investment Authority (Qatar)	**$30 - 40 billion**
Other Central Bank Reserves	**$385 billion**
Iran	$70 billion
Algeria	$70 billion
Libya	$50 billion
Norway	$50 billion
Nigeria	$45 billion
Venezuela	$45 billion
United Arab Emirates	$25 billion
Oman	$15 billion
Kuwait	$10 billion
Qatar	$5 billion
	$1.50 - $1.85 trillion

Source: PIMCO calculation based on IMF *International Financial Statistics*, Central Bank and Finance Ministry data, and news articles

Figure 5

accumulation by oil exporter governments is remarkably robust over time. As a rule of thumb, each $10 increase in average crude prices sustained for a year raised asset accumulation by oil sovereigns by $90-100 billion annually. Using this extrapolation, even with crude at $50 per barrel, oil sovereigns would still be channeling some $300 billion of savings annually into global financial markets. Though sustained growth of investment and import demand are likely to reduce these figures over time, they are likely to remain large especially in the near term.

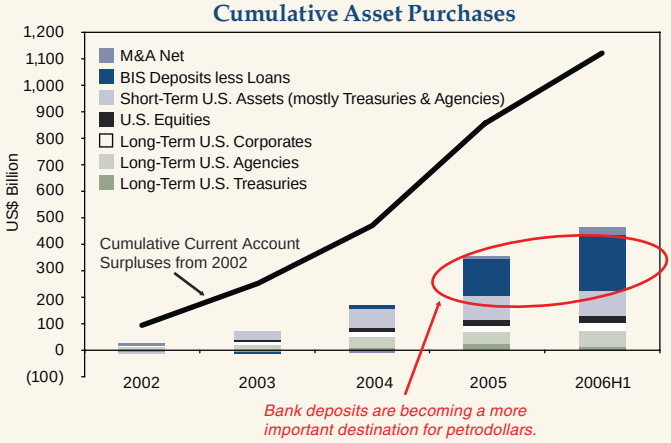
The result of these new savings *flows* is that the total asset *stocks* under management by oil producers have increased dramatically. Information on these asset stocks is scarce, since many oil producers do not publish information on the sizes of their various funds. However, using press reports and other publicly available information, we estimate that the sovereign assets of oil producers totaled approximately $1.50-$1.85 trillion as of mid-2006 as shown in Figure 5. Union Bank of Switzerland estimates that global sovereign assets are approximately $6.5-7.0 trillion, which would make oil producer assets about 25% of the total. Clearly oil exporters have become key players in the global financial system.

Petrodollar Investments: Where To?

Where are these oil funds being invested? With very few exceptions, oil producers do not publish data on the composition of their asset holdings or purchases.[6] We therefore rely on third-party data for direct evidence on which assets are being purchased by oil exporting countries.

There are three key sources: (1) the U.S. Treasury International Capital (TIC) system, which reports foreign purchases of long-term U.S. securities as well as short-term holdings of U.S. securities by foreigners; (2) the Bank for International Settlements (BIS) locational banking statistics, which reports on commercial banks' deposits and loans vis-à-vis individual countries; and (3) Bloomberg's database on mergers and acquisitions (M&A). By comparing recorded asset purchases by oil exporters in these three sources to the current account surpluses registered by those exporters, we can estimate what proportion of petrodollar flows is identifiable and where these flows are going.[7]

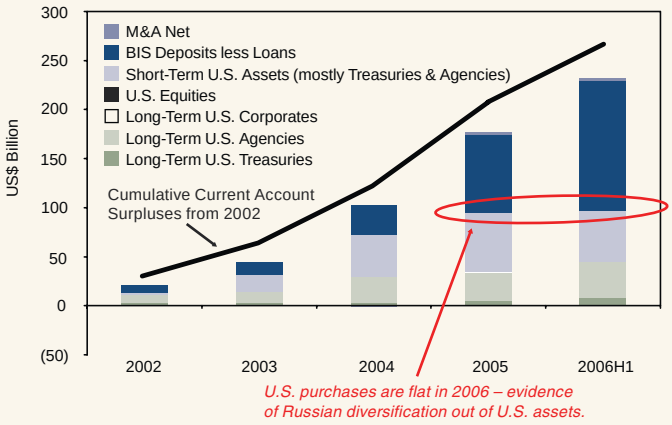
All Major Oil Exporters: Cumulative Asset Purchases



Identifiable Purchases
$464 billion (41%) in identifiable asset purchases
of which…
$212 billion (46%) in net BIS deposits
$94 billion (20%) in short-term U.S. claims (Treasuries/Agencies)
$63 billion (14%) in long-term U.S. Agencies
$29 billion (6%) in long-term U.S. Corporates
$28 billion (6%) in net M&A activity
$26 billion (6%) in U.S. equities
$12 billion (3%) in long-term Treasuries

Figure 6a

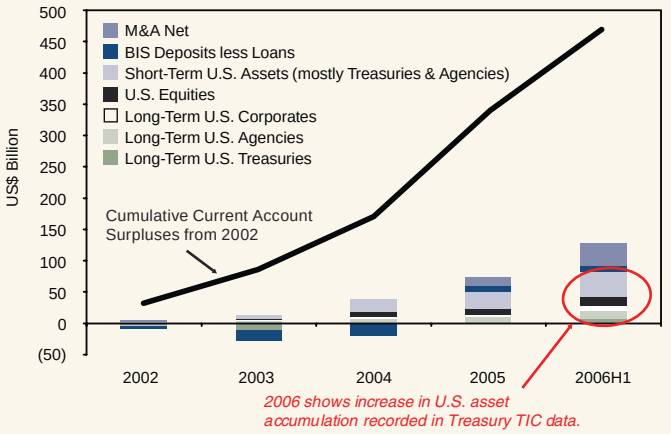
Cumulative Russia: Asset Purchases



Identifiable Purchases
$232 billion (87%) in identifiable asset purchases
of which…
$133 billion (57%) in net BIS deposits
$52 billion (22%) in short-term U.S. claims (primarily Agencies)
$37 billion (16%) in long-term U.S. Agencies
$8 billion (3%) in long-term U.S. Treasuries
$2 billion (1%) in net M&A activity
Zero in long-term U.S. Corporates
Zero in U.S. equities

Figure 6b

Middle East OPEC Exporters: Cumulative Asset Purchases



Identifiable Purchases
$128 billion (27%) in identifiable asset purchases
of which…
$39 billion (30%) in short-term U.S. claims
$37 billion (29%) in net M&A activity
$16 billion (12%) in U.S. equities
$13 billion (10%) in long-term U.S. Agencies
$9 billion (7%) in net BIS deposits
$7 billion (6%) in long-term U.S. Treasuries
$7 billion (6%) in long-term U.S. Corporates

SOURCE: Bank for International Settlements, Treasury International Capital System, Treasury Bulletin, Bloomberg

Figure 6c

Using this approach, we find that identifiable asset purchases ($464 billion) accounted for over 40% of implied petrodollar savings between 2002 and the first half of 2006, as illustrated in Figure 6a. Several other key points emerge from the data:

- *Low-risk assets dominate recorded asset purchases*. About 66% of total identifiable purchases flowed into bank deposits and short-term U.S. securities (mostly Treasuries and agencies). Only about 10% flowed into U.S. corporate debt and U.S. equities.

- *Country coverage is highly uneven*. While almost all of Russian asset accumulation is documented in the third-party data shown in Figure 6b, only 27% of Middle Eastern savings is accounted for in Figure 6c.

- *Middle Eastern countries have much more diversified asset preferences than other producers like Russia, where the central bank is the primary recipient of oil savings*. Almost 80% of recorded Russian asset purchases flowed into bank deposits and short-term U.S. agency securities.[8] In contrast, Middle Eastern countries divided their recorded purchases in roughly equal proportion among short-term U.S. securities, M&A activity, and various long-U.S. securities including equities.

In addition to these long-term characteristics, these figures illustrate some recent trends in the data:

- *Bank deposits are a growing destination for petrodollars.* Oil exporters added some $200 billion in bank deposits (net of loans) in 2005 and the first half of 2006 – about 1/3rd of the combined current surpluses over this period.

- *More Middle Eastern oil savings is flowing into corporate acquisitions.* Net M&A by Middle Eastern producers totaled $37 billion between 2005 and the first half of 2006. Purchases have been focused in the areas of transportation, telecommunications, natural resources, and property, as the examples in Figure 7 illustrate.

- *Evidence of Russian diversification out of U.S. dollars appears in 2006.* Russian purchases of U.S. assets closely tracked Russian current account surpluses until the first half of last year, when net purchases of U.S. assets dropped almost to zero.

Five Largest M&A Deals by Oil Exporter Acquirers (2002-2006H1)

Target	Acquirer	Total Value (US$ billion)	Announced
Peninsular & Oriental Steam (U.K.)	Ports, Customs, and Free Zone Corp (UAE)	7.8	11/29/05
Turk Telekom (Turkey)	Oger Ltd (Saudi Arabia)	6.6	7/ 1/05
Fairmont Hotels & Resorts	Kingdom Hotels (Saudi Arabia) & Colony Capital (U.S.)	3.4	1/30/06
VAW Aluminum (Germany)	Norsk Hydro (Norway)	2.8	1/ 7/02
Pakistan Telecom (Pakistan)	Emirates Telecom Corporation (UAE)	2.6	6/20/05

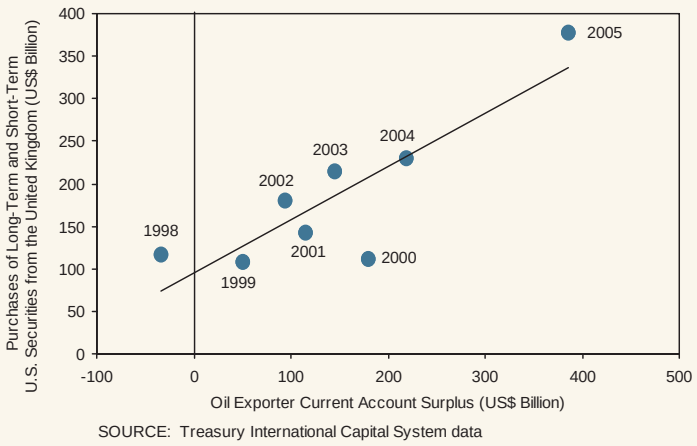
Source: Bloomberg

Figure 7

Analysts have pointed out that the TIC data on purchases of U.S. assets systematically underestimate purchases by oil exporters, particularly from the Middle East, because asset purchases as recorded by TIC may not capture the ultimate owner of a security when it is purchased via a third-country broker-dealer or held on behalf of another owner by a third-party custodian.[9] This inherent difficulty with the data is further compounded if the owners wish to keep their identities undisclosed out of concern their assets could be at risk of being frozen under post-September 11 authorities provided by the U.S.A. Patriot Act.

Figure 8 provides some circumstantial evidence of oil exporter purchases via London financial intermediaries. It shows that purchases of long-term and short-term U.S. securities attributed to the U.K. show a positive correlation with the annual current account surpluses of oil exporters. Unfortunately, while it is almost certain that some volume of TIC purchases attributed to the U.K. reflect purchases by oil exporters, there is no method of estimating the magnitudes. Indeed, the increases in China's current account surpluses have also corresponded with the increase in U.K.-based purchases; and unlike Middle East flows, identifiable Chinese purchases show up in greater magnitude when flow data is reconciled with separate TIC data on asset stocks.

U.K. Purchases of U.S. Securites vs. Oil Exporter Savings



SOURCE: Treasury International Capital System data

Figure 8

The paragraphs above summarize what we know and can document about asset purchases by oil exporters. About 60% of oil savings is not accounted for by recorded asset purchases, so the data above tell only part of the story. Aside from the undercounting issue in the TIC data, the three data sources reviewed here cover only a subset of potential investments in the global markets. Anecdotal reports suggest large flows toward local Asian equities and dollar-denominated sovereign debt of emerging market countries – purchases that are not tracked through third-party data sources. Estimating the potential magnitudes of these flows and their impact on asset prices can therefore only be done indirectly, a task we turn to in the next section.

Impact of Petrodollars on Asset Prices

As petrodollar surpluses have ballooned, analysts have developed a number of hypotheses about their impact on asset markets. The main hypotheses are summarized in Figure 9, along with a discussion of the supporting evidence and shortcomings.[11]

Each offers a plausible account of observed changes in asset prices, but supporting evidence has been difficult to summon. To the extent that higher incomes in countries with high propensities to save (oil exporters) increases total global savings, this should tend to increase the prices of all assets. Simple correlations between certain asset prices and oil flows, however, can be misleading indicators of causality. For example, low emerging market debt spreads might be correlated with higher oil prices because *both* are produced by strong global growth – not because petrodollars are bidding up emerging market debt. Anecdotal evidence must also be treated with care. For example, even if we believe based on anecdotal evidence that oil exporters are buyers of assets like emerging market debt, this does not tell us what percentage of oil savings is flowing into such investments – 10%, 50%, or 90%? The magnitudes make a big difference to the market outcomes.

To make a first-order approximation of these magnitudes we take a new approach to the data, turning our attention from third-party asset

Impact of Petrodollars on Asset Prices: A Summary of the Debate

Conundrum, Black Gold Version
(Roubini Global Economics)

Argument: Oil surpluses are helping keep long term benchmark interest rates low.

Evidence: Long term rates have stayed low even as Asian intervention has fallen. Central bank reserves are the largest vehicle for oil savings, creating large demand for risk-free assets.

Caveats: Kodres and Warnock (2006) failed to find statistical significance in oil flows for explaining 10-year Treasury yield changes, unlike Asian flows which were statistically significant.[10] Part of the reason might be that oil flows are invested mostly in short-term securities (as reflected in TIC data) whereas Asian purchases are at the longer end of curve.

Appetite for Risk Assets
(Clarium Capital Management)

Argument: Oil surpluses are invested in riskier assets than Asian surpluses, thereby contributing to tighter corporate and EM spreads in fixed income, as well as booming global equities.

Evidence: Credit spreads have tightened and EM equity markets have surged alongside the run-up in oil prices. Anecdotal evidence suggests a significant propensity for Middle East investment funds to purchase riskier assets and invest in leveraged hedge funds.

Caveats: Kodres and Warnock (2006) failed to find statistical significance in oil prices for explaining EM credit spreads. Strong global growth has coincided with oil price increases, complicating correlation arguments. Most identifiable oil surpluses have been saved in low-risk assets. On the other hand, billions in Middle Eastern flows are not accounted for.

Local Real Estate & Equity Booms
(various investment bank analysts)

Argument: Many oil surpluses are "staying in the neighborhood" to go into local investments.

Evidence: Gulf real estate and equity markets have boomed in recent years (though these markets experienced a serious correction in the last year).

Caveats: Large flows are not needed to move prices significantly in thin markets. Because cross-border flows within the Gulf would net one another out in balance of payments, they don't explain where the large current account surpluses are going.

Figure 9

Who Is Investing the Oil Funds?
Cumulative Asset Accumulation 2002-2005 *(US$ Billion)*

CONSERVATIVE	
Central Bank Reserves*	**180**
Bank of Russia Reserves & Stabilization Fund**	**174**
MEDIUM RISK	
Saudi Arabian Monetary Authority (SAMA)***	**114**
AGGRESSIVE	
Gulf Investment Funds	**124**
Kuwait Investment Authority (KIA)	47
Abu Dhabi Investment Authority (ADIA)	66
Qatar Investment Authority	11
Norway Government Petroleum Fund	**85**
Conservative Total (0-5% equities)	**354**
Medium Risk Total (5-30% equities)	**114**
Aggressive Total (>30% equities)	**209**
Private Sector****	170
TOTAL	**847**

* Central Bank Reserves: Excludes Russia and Saudi Arabia. Includes Algeria (37), Venezuela (33), Iran (30), Nigeria (27), Libya (23), Norway (16), UAE (7), Oman (6), Qatar (3), Kuwait (-2). Venezuela includes foreign assets of Social Development Funds. Nigeria includes funds used for debt repayment. Oman includes State General reserve Fund.

** Russia: Includes funds used for debt repayment (30).

*** Saudi Arabia: Includes foreign assets of Autonomous Government Institutions.

**** Private sector: Calculated as a residual for each country by examining recorded flows and statistical discrepancies on the balance of payments.

Source: PIMCO calculations based on IMF *International Financial Statistics*, national Central Bank and Finance Ministry data

Figure 10

surveys to the balance of payments accounts of the exporters themselves. Our goal is to determine where *within* oil exporting countries these investable funds are accumulating – specifically, in return-oriented sovereign investment funds versus conservatively managed central bank reserves. Each of these agents has different investment strategies. Therefore, if we know how much oil savings are flowing into central banks versus investment funds – and we have some information on the asset allocation of those funds – we can estimate the implied demand for different types of assets.

The results of this analysis are summarized in Figure 10. Consider it the most important table presented here because, to paraphrase Willie Sutton, that's where the money is. Key points:

- *The predominance of central banks implies that the bulk of oil savings has flowed to low-risk assets.* Over 50% of oil savings flowing to governments has gone into central bank reserves or other conservative investment vehicles. Low-risk asset holdings of central banks are concentrated in U.S. Treasuries and agency securities, euro-denominated government debt, and dollar- and euro-denominated bank deposits.

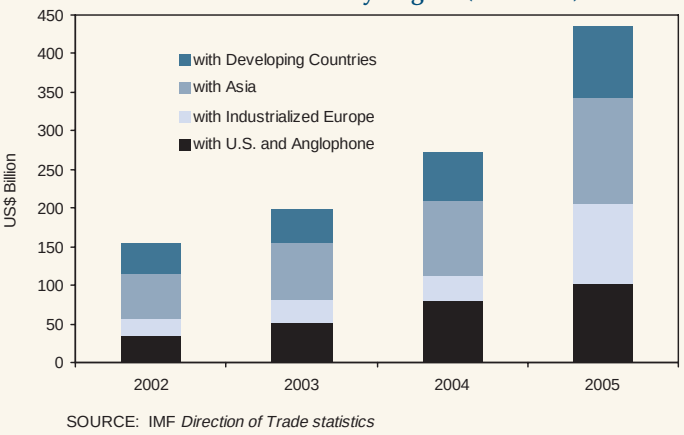
- *At the same time, sovereign investment funds with more aggressive mandates have provided a*

significant bid for risk assets. About 30% of government oil savings flowed into aggressive, return-oriented sovereign investment funds. This implies a diversified asset allocation, both in terms of currency denomination and risk. The equity allocation in these funds is estimated to be in the range of 40-60%, with substantial interest in Asian equities by Gulf investment funds.[12] These funds also have allocations in alternative strategies like real estate and place a portion of their funds with external managers, both real money managers and hedge funds.

The large implied flows into low-risk assets are consistent with the TIC/BIS/Bloomberg data discussed earlier. Indeed, the numbers in the previous section should be regarded as a "lower bound" estimate of the accumulation of low-risk assets by oil exporters, because of the gaps in TIC coverage due to the intermediary issue. At the same time, it is clear that the TIC/BIS/Bloomberg data alone substantially under-represent the share of oil savings flowing to risk assets – hardly surprising, since purchases of such assets as Asian and European equities are not counted in any of these surveys.

Understanding the asset preferences of oil exporters is only one half of the equation, if we wish to analyze the impact of petrodollars on asset prices. The other half is comparing those asset preferences to the preferences of the other

Consolidated Oil Exporter Trade Surpluses with Breakdown by Region (2002-2005)



SOURCE: IMF *Direction of Trade statistics*

Figure 11

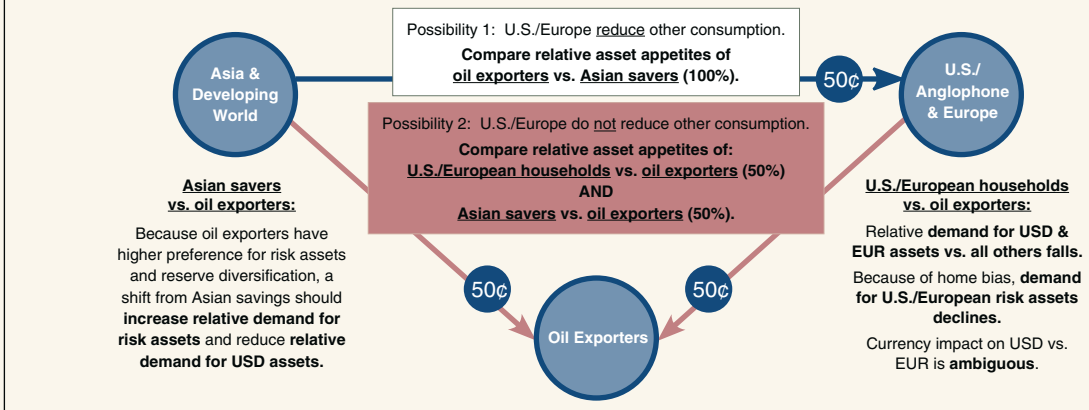
agents in the global economy from whom the oil surpluses were transferred. Figure 11 shows the increase in the consolidated trade surplus of oil exporters with the rest of the world. Between 2002 and 2005, the consolidated surplus increased by $280 billion (from $155 billion to $435 billion). The figure also shows the composition of the increase in the trade surplus by region: the oil exporter surplus with Industrialized Europe increased by $82 billion (29% of the total increase), with Asia by $81 billion (29% of the increase), with the U.S. and Anglophone Countries by $65 billion (23% of the increase), and with Developing Countries by $52 billion (19% of the increase).[13] Therefore in approximate terms, each $1 increase in the trade surplus of oil exporters on average transferred 30¢ to oil exporters from Industrialized Europe, 30¢ from Asian countries, 20¢ from Anglophone Countries (primarily the United States), and 20¢ from Developing Countries. The key question is:

Impact of Petrodollars on Asset Prices – A Framework for Analysis

Step 1. Enumerate assumptions about the asset preferences of different agents

	Oil Exporters	Asia	U.S.	Europe
USD-Denominated Conservative Assets	Moderate	High	Moderate	Low
USD-Denominated Risk Assets	Moderate	Low	High	Low
EUR-Denominated Conservative Assets	Moderate	Moderate	Low	Moderate
EUR-Denominated Risk Assets	Moderate	Low	Low	High
EM Risk Assets	Moderate	Low	Low	Low

Step 2. "Follow the money"



Step 3. Draw conclusions

Source: PIMCO

Figure 12

What would those agents have done with the funds vs. oil exporters?

A framework for analyzing this counterfactual is presented in Figure 12. The first step is to enumerate the differences in asset preferences between oil exporters and counterparts in Asia, the U.S., and Europe. As we have seen, oil exporters as a bloc have diversified asset preferences that span non-risk assets and risk assets, as well as dollar- and non-dollar assets. Other agents have more focused asset preferences either in terms of risk (Asian central banks) or currency (home bias in U.S. and Europe).

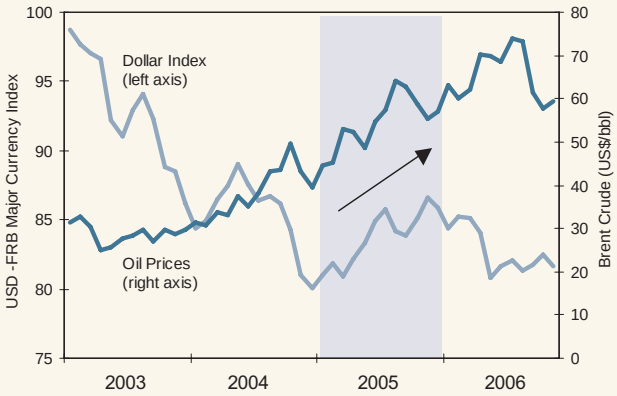
The second step is to trace out how each $1 increase in oil savings reallocates funds within the global economy. In reality this is a complex general equilibrium process in which a range of variables interact. To simplify the problem, we focus only on whether households in the U.S. and Europe react to a rise in energy prices by reducing consumption of other goods (possibility 1) or not reducing consumption of other goods (possibility 2). Because we consider possibility 2 more plausible – and consistent with the changes in global trade balances observed in recent years – we use this as the baseline assumption for the rest of the analysis here. This is important because some writing on the petrodollar issue focuses

only on the contrast between Asian preferences for low-risk assets versus oil exporter preferences for risk assets. The framework here shows that oil exporter preferences must be compared to *both* Asian asset preferences *and* U.S./European asset preferences.

Bringing these elements together, one unambiguous conclusion is that a transfer of funds to oil exporters should boost relative demand for non-dollar/non-euro assets, particularly risk assets, which is consistent with the strength of emerging market currencies and equities that we have seen in the last few years. Other outcomes are more ambiguous, for example, the impact on U.S. and European risk assets such as corporate fixed income and equities, for which home bias demand would otherwise be present.

Applying this framework to currencies, we can see that the impact on the dollar against major currencies like the euro is also ambiguous. At first glance, the appreciation of the dollar against major currencies in 2005 – when crude oil prices increased 50% as shown in Figure 13 – seems to run counter to the standard argument that because oil exporters have more diversified currency preferences than other global agents, an increase in oil prices should be negative for the dollar. But by applying the framework, as we have illustrated in Figure 14, we can see that even a relatively modest dollar share preference of greater than 60% by oil exporters is sufficient to lend support to the dollar.

Oil Prices and the U.S. Dollar



SOURCE: Haver Analytics

Figure 13

The Framework in Action: Incremental Demand for Dollars

A $1 increase in trade surplus of oil exporters:

- increases dollar financing need of the U.S./Anglo countries by 18¢ (the U.S. portion of the increase in U.S./Anglo deficit with oil exporters), and…
- reduces dollar financing supply by Asian and Developing Country savers by 42¢ (80% of foregone Asian external savings and 90% of foregone Developing external savings).*

This sums to 60¢ in net dollar financing need produced by the reallocation of global savings to oil exporters.

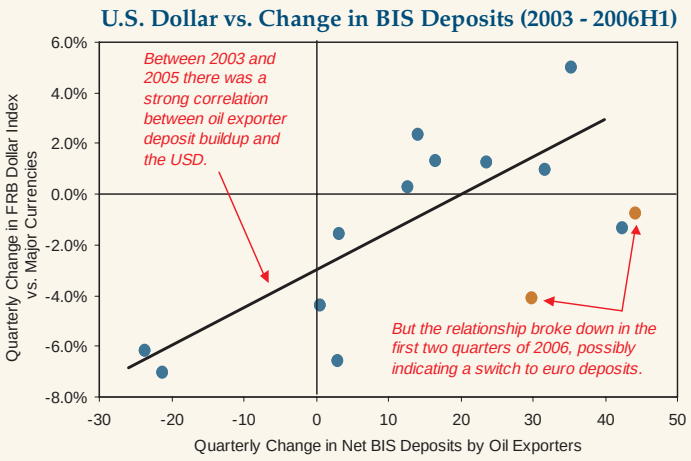
If oil exporters have >60% dollar share appetite for their savings, then oil exporter demand for dollar assets would exceed the dollar financing need, causing the dollar to appreciate relative to its value had oil prices not increased.

Conversely, if marginal appetite for dollar assets by oil exporters falls below 60%, this would put pressure on the dollar to depreciate.

** The 30¢ increase in European financing needs does not affect dollar financing needs or dollar financing supply.*

Figure 14

And in 2005, the fact that the increase in oil prices was a "surprise" may have provided an added boost as oil exporters built up dollar deposits above long-term asset allocation preferences simply because they did not have the chance to plan where to invest the funds.[14] Russia is a good example of this, as reserves simply accumulated in the central bank and were invested in conservative U.S. assets, as we saw



SOURCE: Bank for International Settlements, Haver Analytics

Figure 15

earlier. Figure 15 provides circumstantial support for this hypothesis, showing the quarterly change in the dollar versus the change in bank deposits by oil exporters. The correlation observed between 2003 and 2005 breaks down in early 2006, possibly indicating a switch to from dollar- to euro-denominated deposits by exporters. Indeed, Russia made several high-profile announcements last year on both currency diversification and the goal of orienting its portfolio more toward generating return.

Petrodollars and the Future of Bretton Woods II

The previous section elaborated a framework for thinking about the impact of petrodollars on asset prices. In this final section, we take a step back from the detailed review of flows and marginal asset preferences to consider the broader impact of the rise of petrodollars on the global financial system.

The most influential framework for describing the current international financial arrangements is the so-called Bretton Woods II (BWII) paradigm put forth by Michael Dooley, David Folkerts-Landau, and Peter Garber in a series of papers beginning in 2003. BWII argues that the current system of global exchange rates is broadly stable despite the large and growing current account deficit of the United States. It is stable because the United States does not need to worry about the consequences of a sudden loss of financing by private investors concerned about capital losses on their growing stock of dollar-denominated assets. Rather, Asian central banks will continue to purchase U.S. assets and finance the deficit as part of their long-term strategy of maintaining undervalued exchange rates to stimulate domestic economic development. Under BWII, to the extent that the dollar does need to adjust over time to moderate the growth of the U.S. current account deficit, it will do so in an orderly fashion rather than a disorderly crash.

A key assumption of BWII is that the principal agents in the system have an interest in maintaining the current regime – an objective to which they will subordinate other goals, such as maximizing financial return. To quote the authors:

> "We emphasize the idea that it has been a successful development strategy to *subordinate the objective of maximizing the value of reserve assets in order to subsidize and build a*

> *domestic capital stock capable of competing in international markets*. This is not a first best strategy. It would be better to have both an internationally competitive capital stock and reserves that were superior investments. But, if a country had to choose one or the other, a competitive capital stock may well be the better choice."[15]

In contrast to Asian central banks, oil exporters are generally not buying assets for the secondary purpose of maintaining exchange rates to promote industrialization. Though competitiveness issues are a consideration,[16] oil sovereigns in general have greater regard for maximizing financial returns on their assets for the future. Even central banks in oil exporting countries – while not seeking to maximize returns in the same way as investment funds – likely have greater sensitivity to capital losses, since this objective is not subordinated to an overall economic development agenda in the same way that it is for Asian countries.

Although oil exporters certainly do not have an interest in a disorderly adjustment of global imbalances, their concern for financial return increases the instability of the BWII regime in two ways. First, on a flow basis, sustained high oil prices could produce downward pressure on the dollar as oil exporters seek asset diversification on simple portfolio risk/return grounds. As described in the previous section, the dollar may have been supported recently because the large increases in oil prices were unexpected and producers therefore did not have sufficient lead-time to plan their investments. But with the surprise behind us, there will likely be pressure on the dollar to weaken to the extent that oil exporters' long-term marginal appetite for dollar assets is below the new dollar financing demand and displaced dollar asset demand of oil importers.

Second, on a stock basis, the growing asset base under the management of oil sovereigns increases the fat-tail risks of a sudden adjustment in exchange rates. BWII assumes that Asian central banks will refrain from switching out of their dollar assets in a precipitous fashion, even on signs of dollar weakness, because their concern about capital losses is secondary to their interest in maintaining the stable system of exchange rates. The rise of petrodollars, however, changes the equation by adding another major player to the system. It is not clear that oil exporters facing the prospect of large capital losses on their dollar portfolios will show the same willingness to stay put in dollar assets. Doing so would risk large capital losses on asset stocks that are needed to sustain consumption levels in future years when oil revenues diminish. The greater willingness of oil exporters to reallocate their large portfolio holdings out of dollars in the face of a potential dollar drop makes such a drop more likely in periods of market stress.

Five Key Conclusions

In closing, we summarize five key conclusions that emerge from the preceding discussion of petrodollars and the global economy:

1. Oil exporter governments are poised to remain the **predominant source of global savings** even with the decline in oil prices from their record highs.

2. The vast majority (>80%) of the oil savings flow to **governments and central banks** in oil-exporting countries.

3. Data on asset purchases capture less than half of petrodollar savings, but available data and inferences drawn from where assets are accumulating suggest that the bulk of investment flows have been into **low-risk assets.**

4. Sovereign investment funds, which captured more than one-quarter of oil exporter savings during the past four years, provide a significant **bid for risk assets**, particularly in emerging markets.

5. The most profound impact of the rise in petrodollar savings is on the **stability of the BWII system** given the greater focus of oil exporters on financial return, in contrast to the non-financial objectives of Asian central banks that have maintained the existing regime.

The international economy has witnessed a seismic shift in the global distribution of savings during the last five years as progressively larger volumes of capital have flowed from emerging market countries to the developed world. Petrodollars have been an integral part of that story. Distinguishing what we know and what we do not know about petrodollars – and developing a framework for analyzing their impact on asset markets – is critical to gaining insight into the evolution of global financial markets in the months and years ahead.

Ramin Toloui
Senior Vice President
ramin.toloui@pimco.com
January 16, 2007

[1] International Monetary Fund (2006a), *World Economic Outlook,* Statistical Appendix, September, pp. 177-265.

[2] Michael Dooley, David Folkerts-Landau, and Peter Garber (2003), "An Essay on the Revived Bretton Woods System," National Bureau of Economic Research, Working Paper 9971, September.

[3] The figures here are estimates from International Monetary Fund (2006a). We add Norway to the IMF's "Fuel Exporters" category to get the figures reported here.

[4] The current account surpluses of oil producers as a group total to about 12% of their combined GDP, with some Gulf states running current account surpluses equal to around 50% of GDP.

[5] The share of non-Middle East producers has declined over time. In 2006, Russia and Norway are projected to account for about 33% of the total, while adding Venezuela and Nigeria brings the share to around 40%.

[6] Norway's Government Pension Fund is the most significant exception.

[7] Other efforts to measure these flows through counterparty data can be found in Brad Setser and Rachel Ziemba (2006), "Petrodollar Watch," *RGE Monitor,* October; International Monetary Fund (2006b), "Oil Prices and Global Imbalances," *World Economic Outlook,* September, pp. 71-96; and Patrick McGuire and Nikola Tarashev (2005), "The International Banking Market," *BIS Quarterly Review,* December, pp. 15-30.

[8] For details on Russian reserve accumulation, see Brad Setser and Christian Menegatti (2006), "Russian Reserve Watch," *RGE Monitor*, October.

[9] For a thorough discussion of interpreting U.S. Treasury International Capital data, see Carol Bertaut, William Griever, and Ralph Tryon (2006), "Understanding U.S. Cross-Border Securities Data," *Federal Reserve Bulletin,* pp. A59-A75.

[10] Laura Kodres and Frank Warnock, (2006) "The Impact of Petrodollars on U.S. and Emerging Market Bond Yields," IMF World Economic Outlook, April 2006, pp. 89-91.

[11] In addition to the other sources cited in footnotes, see George Magnus (2006), "Petrodollars: Where Are They and Do They Matter?" UBS Investment Research, July, and Kevin Harrington (2006), "The Petrodollar Illusion," Clarium Capital Management, September.

[12] George Magnus and Massimiliano Castelli (2006), "Capital Flows and the World Economy: Petrodollars, Asia, and the Gulf," UBS Investment Research, November.

[13] We focus here on the impact of oil prices on changes in trade balances – rather than on export revenues – because it is trade balances that correspond to the impact on net global savings. The changes in trade balances incorporate the differences in oil exporters' propensities to consume imports from different regions. A number of analysts have pointed out that oil exporters' propensity to consume imports is lower for goods from the United States than it is for goods from Europe and Asia. The data analysis in this study shows the same result. So why do we observe a larger deterioration in the trade balances of Industrialized Europe and Asia for each $1 increase in the oil exporter trade surplus than for the Anglophone Countries, including the United States? A key reason is that figures used here for the United States do not include oil imports from Canada or Mexico. These countries are excluded because they are not major accumulators of petrodollars assets. Because U.S. oil imports from the 12 major petrodollar accumulators are substantially lower than those of Europe and Asia, the U.S. accounts for a smaller portion of the increased petrodollar trade surpluses than Europe and Asia despite higher propensities of oil exporters to import from the latter.

[14] See Jeffrey Young and Gabriel de Kock (2006), "Oil, Petrodollars, the USD and the CAD," *CitiFX Views,* Citigroup, September 14, pp. 5-8.

[15] Dooley, Folkerts-Landau, and Garber (2003). Italics added

[16] While oil exporters are not indifferent to exchange rate appreciation and its negative impact on non-commodity sectors of the economy, their priorities in this regard differ fundamentally from Asia. In Asia, the competitiveness of manufacturing exports anchors the overall development strategy, whereas for oil exporters it is typically commodity exports themselves. Again, Russia will be the interesting case to watch: the value of the currency has in fact been an important consideration in central bank reserve accumulation to date, whereas going forward the Oil Stabilization Fund – endowed last year with external assets – is intended to be a more return-oriented vehicle.

P I M C O

840 Newport Center Drive

Newport Beach, CA 92660

949.720.6000

PER042-122206