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Did Easy Money in the Dollar Bloc Fuel the Global Commodity Boom?

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Abstract: Among the various explanations for the runup in oil and commodity prices of recent years, one story focuses on the role of monetary policy in the United States and in developing economies. In this view, developing countries that peg their currencies to the dollar were forced to ease their monetary policies after reductions in U.S. interest rates, leading to economic overheating, excess demand for oil and other commodities, and rising commodity prices. We assess that hypothesis using the Federal Reserve staff's forward-looking, multi-country, dynamic general equilibrium model, SIGMA. We find that even if many developing country currencies were pegged to the dollar, an easing of U.S. monetary policy would lead to only a transitory runup in oil prices. Instead, strong economic growth in many developing economies, as well as shortfalls in oil production, better explain the sustained runup in oil prices observed until earlier this year. Moreover, a closer look at exchange rates and interest rates around the world suggests that the monetary policies of many developing economies, including in East Asia, are less closely influenced by U.S. policies than is frequently assumed.

Keywords: oil prices, SDGE models, monetary policy

JEL Classification: F41, F42

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I. Introduction and Summary

During the years preceding the world recession, global commodity prices shot up dramatically. As shown in Figure 1, the price of WTI oil more than tripled between the end of 2002 and the end of 2007, and it then rose another 60 percent or so to its peak in early July 2008. The IMF index of non-fuel commodity prices roughly doubled between end-2002 and its peak in mid 2008, driven by especially strong increases in the prices of food and metals. Given the consequences of these movements for global inflation, economic activity, and the pattern of external imbalances, it is not surprising that they garnered tremendous attention by analysts and policymakers alike.

More recently, the global spotlight has shifted away from commodity prices, partly because they have come down considerably since their peak last year and also because of the intensification of financial turmoil and recession around the world. Yet, the behavior of commodity prices remains an important issue for the global economy. First, commodity prices remain quite elevated relative to their levels earlier in this decade. Second, their prior runup exacerbated the effects of the financial turmoil: it reduced real disposable income in many commodity-importing countries, and its inflationary effects constrained some central banks from loosening monetary policy in response to financial strains. Third, the more recent downturn in commodity prices exacerbated financial and real-side pressures in many emerging market economies. Finally, if concerns about the global economy were pulling commodity prices down after the middle of last year, it seems plausible that once economic conditions are seen to normalize, commodity prices might resume their rise. In fact, oil and other commodity prices have moved up from their recent lows as prospects for recovery appear to have improved.

Accordingly, understanding the runup in commodity prices of recent years remains a high

priority for analysts and policymakers. A plethora of explanations, many of them complementary, for the rise have been advanced. One group of these focuses on the fundamentals of supply and demand: industrialization in China and other developing countries substantially boosted the demand for commodities, while a combination of slowly growing capacity, weather problems, and geopolitical concerns prevented the supply of commodities from keeping up. (See Figures 2-3, as well as IMF, 2008, and Interagency Task Force, 2008.) A second explanation focuses on the role of speculators in driving commodity prices upward. According to a third explanation, declines in interest rates caused by the Fed's monetary easing led to runups in commodity prices by depressing the dollar and by reducing the cost of holding inventories, thus diminishing the incentive to extract resources today rather than saving them for the future (Frankel, 2008).

Finally, last year, a fourth broad explanation for the runup in commodity prices emerged which, intriguingly, married elements of the fundamentals-based explanation with the view that the runup was caused by Federal Reserve loosening. This explanation, which for convenience we will call the "dollar bloc" story, starts with the premise that many developing economies have pegged their currencies to the U.S. dollar. Accordingly, when the Federal Reserve loosened monetary policies, starting in the fall of 2007, these developing countries had to loosen their policies as well, even though such loosening was not appropriate to their economic circumstances. This led to an overheating of their economies, excess demand for commodities, and sharp increases in commodity prices. Martin Wolf (2008) wrote in the middle of last year:

Today, the hapless Federal Reserve is trying to re-expand demand in a post-bubble US economy. The principal impact of its monetary policy comes, however, via a weakening of the US dollar and an expansion of those overheating economies linked to it. To simplify, Ben Bernanke is running the monetary policy of the People's Bank of China. But the policy appropriate to the US is wildly inappropriate for China and indeed almost all the other countries tied together in the informal dollar zone or, as some economists

call it, “Bretton Woods II”.

Similarly, The Economist (2008) observed:

Apart from the Gulf States, few countries still peg their currencies to the dollar, but most try to limit the amount of appreciation. This means that as the Fed cuts rates there is pressure on emerging economies to do the same, to prevent capital inflows pushing up their exchange rates...In the face of rising inflation, emerging economies should be lifting interest rates, not cutting them, but their rigid currency policies makes this hard. In turn, continued surging demand in emerging economies boosts commodity prices, which reduces Americans’ spending power and so encourages the Fed to cut rates further. The more the Fed cuts, the bigger the risk of inflation in emerging markets.

This paper assesses the plausibility of the dollar bloc explanation for the global runup in commodity prices. Because of its central role in the global economy, we focus on the price of oil. Sections II and III use the Federal Reserve staff’s forward-looking dynamic general equilibrium model to answer the questions: Can the Federal Reserve’s monetary stance in recent years plausibly explain the runup in global oil prices?¹ If not, what other factors were likely important? Section IV addresses one of the underlying premises of the dollar bloc explanation, that the currencies of many emerging market economies are linked to the dollar to a sufficient extent that these economies effectively “import” the monetary policy of the United States. Section V concludes.

The main results of our analysis are as follows: First, our model simulations indicate that, in a world where an appreciable portion of the global economy (20 percent) is assumed to be pegged to the dollar, a loosening of U.S. monetary policy on the order of what occurred in recent years—with the real federal funds rate falling some 2 percentage points below its historical average in 2004 through 2007—can indeed cause a sharp spike in oil prices. This occurs because the economies pegged to the dollar receive stimulus (both as their currencies follow the dollar downward and as they loosen their own monetary policies) and this boosts their

¹ A similar exercise is described in IMF (2008).

GDP and thus their demand for oil. However, the spike in oil prices is short-lived. As the pegged economies overheat, their GDPs return to trend, oil demand softens, and oil prices retrace their earlier rise; moreover, the extent of the initial spike in oil prices further supports subsequent reductions in the demand for oil. Accordingly, even a sustained easing of U.S. monetary policy does not appear to be able to induce the sustained rise in oil prices we observed earlier in this decade.

If U.S. monetary ease does not explain the runup in oil prices, what does? We performed a number of simulations to assess the plausibility of the most prominent “fundamentals” based explanations for the surge in oil prices. To begin with, we analyzed the effects of an acceleration of productivity growth sufficient to boost world GDP growth by about 1 percentage point; this increase is comparable to the runup in global growth seen earlier this decade compared with its historical average. Our model simulation suggests that such an increase in economic growth, because it is sustained, could lead to a similarly sustained rise in oil prices in the neighborhood of 70 percent above their baseline level.

We then evaluated the impact of a sustained reduction in the growth of global oil production of 1½ percentage points, comparable to the reduction in growth that actually occurred in recent years. Such a shock would boost the price of oil persistently more than 30 percent above its baseline level. Combining both simulation experiments, we find that the higher global GDP growth and the reduction in oil supply would together lead to a sustained doubling of the oil price, comparable to where oil prices now stand relative to their value earlier this decade.

In sum, the fundamentals-based explanation for the runup in oil prices appears more plausible than the “dollar bloc” story, and this holds true, even if we assume that a fifth of the global economy is rigidly pegged to the dollar. In the final part of the paper, we assess whether

foreign developing economies, particularly those in East Asia, are as closely pegged to the dollar as commentators assert. We find that East Asian exchange rates against the dollar are somewhat less variable than exchange rates of other countries, but to a lesser extent than is implied by much commentary on the subject. Moreover, we find that East Asian policy interest rates are generally less correlated with U.S. interest rates than the interest rates of several countries whose currencies are generally acknowledged to be floating, such as Canada and the euro area. This result remains true, even when we control for cyclical influences on monetary policy such as inflation and output. All told, these findings further diminish the plausibility of the “dollar bloc” explanation for the runup in oil prices of recent years.

II. Model Description

SIGMA is a multi-country, multi-sector dynamic general-equilibrium model used for policy analysis by Federal Reserve staff. We conduct our simulations in a three-country version of SIGMA that includes the United States, a group of “dollar bloc” countries that maintain fixed exchange rates against the U.S. dollar, and an aggregate “rest of the world” (ROW) block comprised of all other foreign countries.² Monetary policy in both the United States and ROW block is assumed to follow a modified Taylor rule that reacts to inflation and output growth (rather than the output gap), and which allows for a modest degree of interest-rate smoothing.

SIGMA has a high degree of formal similarity in the structure of key behavioral equations across the three country blocks. The core of the model has its antecedents in the seminal open economy modeling framework of Obstfeld and Rogoff (1995), but it embeds a wide array of nominal and real rigidities that have been identified by the literature as important

² The SIGMA model and its properties are described by Erceg, Guerrieri, and Gust (2006). The inclusion of an oil sector in the model is detailed by Bodenstein, Erceg, Guerrieri (2007).

empirically. Thus, consumption behavior is consistent with the permanent income hypothesis in the longer-term, though our model incorporates habit persistence which effectively makes consumption more inertial in the short-run. Investment depends on Tobin's Q , though we follow Christiano, Eichenbaum, and Evans (2005) in assuming that investment adjustment costs depend on the change in investment rather than in the capital stock. This increases the persistence in the investment response relative to the standard Q -theory approach. Government spending evolves exogenously (as a share of GDP), and the fiscal authority is assumed to adjust lump-sum taxes in a manner that enables the government to satisfy its intertemporal solvency constraint.

On the aggregate supply side, inflation is determined by a fairly conventional New-Keynesian Phillips Curve that allows for some intrinsic persistence: thus, inflation depends partly on its own lag, but also on marginal cost and the inflation rate expected to prevail in the future. Marginal costs rise when output exceeds potential or when real wages rise above the level that would prevail if wages were completely flexible (in which case wages would immediately adjust to changes in fundamentals, such as higher oil prices). Nominal wages change sluggishly given that they are set in long-term staggered contracts. This contributes to some additional inertia in prices given the substantial influence of wages on marginal cost.

Each country or country block in our model is regarded as producing a basket of non-oil goods that it can either export or use to satisfy domestic demand. Because each country's basket is an imperfect substitute with the basket produced by other countries, the demand curve for its export basket is downward-sloping in its relative price. Producers in each country are assumed to set prices in the buyers' currency (following a Calvo-style timing assumption for price-setting). This is consistent with the "local currency pricing" assumption embedded into many

open-economy macro models (e.g., Betts and Devereux [1996] or Devereux and Engel [2002]), and implies gradual adjustment of trade prices to exchange rate movements. Moreover, our model incorporates adjustment costs that penalize rapid changes in bilateral trade shares. This specification captures the idea that it may be costly for households and firms to vary the *composition* of their import basket in the short-run in response to relative price changes, even while allowing aggregate imports to respond rapidly to changes in real activity.

Our model also includes a world oil market in which the price of oil is determined to equate world demand and supply. In each country, oil is demanded by firms as an input into production and by households as a component of their consumption bundle (which also includes imports and domestically-produced goods). In line with our specification of non-oil trade, our model incorporates adjustment costs that penalize rapid changes in the share of oil used in production and consumption. As a result, the short-run price elasticity of demand for oil is much lower than the long-run elasticity of demand, consistent both with empirical and anecdotal evidence.³ This feature has the familiar implication that demand would decline very slowly in response to a hypothetical permanent rise in the oil price, as the half life of the response is calibrated to equal 10 years. Oil supply is assumed to be exogenously fixed in each country block, though the initial endowment is much larger relative to per capita output in the ROW block; according, the latter is a net exporter of oil, while the U.S. and dollar bloc countries are importers. Using 2007 data from the British Petroleum Statistical Review, we calibrate oil imports for the United States to 77 percent of total demand in the non-stochastic steady state, implying that 33 percent of oil demand is satisfied by domestic production. Similarly, for the

³ See, for example, Dahl and Sterner (1991) or Atkins Jazayeri (2004), who report estimates ranging between 0 to 0.11 for the short-run price elasticity of demand (in absolute value) and between 0 and 3.44 for the long-run elasticity. Bodenstein, Erceg, and Guerrieri (2007) provide estimates of the oil demand equation in the SIGMA model consistent with the calibration chosen here.

dollar bloc, we calibrate oil imports to 40 percent of total demand.

The model is calibrated so that the United States comprises about 25 percent of world output. The dollar bloc is assumed to include most major developing economies in both developing Asia and Latin America (referred as DA-LA block below), and accounts for 20 percent of world GDP.⁴ As we argue below in Section 4, this calibration substantially overstates the share of world output accounted for by countries that could reasonably be described as forming part of a dollar bloc. Even though some countries that are admittedly dollar peggers are omitted from the dollar bloc due to data limitations – notably some Middle East oil exporters – this omission is more than counterbalanced by the inclusion of a broad set of major developing countries that allow their currencies to vary substantially against the dollar. Thus, we interpret the 20 percent share of world output as an upper bound on the importance of the dollar bloc. The ROW accounts for the remainder of world GDP (55 percent).

We use national accounts data to calibrate expenditure shares for each of the three country blocks in our model. We use data on oil consumption from British Petroleum to calibrate the energy intensity of each country block. Under our calibration, the share of oil expenditures as a fraction of GDP is roughly 4 percent in the United States and in the two foreign blocs. Model parameters determining bilateral trade flows for both non-oil goods and oil are derived using nominal trade shares from the IMF’s Direction of Trade Statistics and data from the IEA on each country block’s oil production and consumption.

III. Simulation Results

Our first SIGMA simulations are designed to evaluate the hypothesis that accommodative

⁴ The developing Asian countries included in the DA-LA bloc are China, Hong Kong, Indonesia, Korea, Malaysia, the Philippines, Singapore and Thailand. The Latin American countries included in the DA-LA bloc are Argentina, Brazil, Chile, Mexico and Venezuela.

U.S. monetary policy in response to adverse shocks originating in the United States generated a boom in emerging market countries through the mechanism of fixed exchange rates, thus helping to fuel an associated runup in oil (and other commodity) prices. In these simulations, we assume that the underlying shock to the United States is simply a fall in the exogenous component of consumption demand, with no direct spillover to other countries. As seen in Figure 4 (lower left panel), the shock is scaled so that the U.S. real ex post policy rate falls 2 percentage points below baseline, which is roughly the average amount by which the real federal funds rate over the 2004-2007 period dipped below its corresponding average over the 1990-2003 period. In order to assess the impact of monetary policy in the dollar bloc countries, we contrast our benchmark calibration in which the dollar bloc countries maintain pegged exchange rates (“DALA Peg”) to an alternative in which all countries, including those in the dollar bloc, follow the Taylor rule (“All Taylor”).

As seen in Figure 4, the U.S. aggregate demand contraction has quite similar effects on output, inflation, and interest rates in the United States irrespective of the particular assumption about foreign monetary policy. U.S. output falls persistently, headline price inflation falls below baseline in response to the negative output gap (notwithstanding a transient initial rise due to higher oil prices), and U.S. policy rates decline as implied by the Taylor rule. Because real short-term interest rates fall much more sharply than interest rates abroad, the U.S. real exchange rate depreciates. This stimulates U.S. real net exports, and helps cushion the impact of the domestic spending decline on U.S. GDP. As expected, the size of the real dollar depreciation is somewhat smaller in the benchmark case in which 20 percent of the world pegs than if all countries followed a Taylor rule. Although this implies that the stimulus to U.S. exports arising from a relative price channel is smaller in the benchmark case, foreign activity shows a much

larger expansion (as shown below). As a result, the stimulus to U.S. real exports turns out to be fairly similar irrespective of the assumption about monetary policy in the dollar bloc. This implication and the relatively low degree of openness of the U.S. economy help explain why U.S. output appears nearly invariant to the assumption about foreign monetary policy.

By contrast, the effects of the U.S. aggregate demand contraction on foreign economies depend starkly on the monetary policy pursued by the dollar bloc countries (Figure 5). Focusing initially on the case in which all countries follow the Taylor rule, aggregate foreign output and inflation (a GDP-weighted average across the dollar bloc and ROW) are nearly insulated from the shock. Although foreign real net exports decline due to exchange rate appreciation and the fall in U.S. activity, the effects on foreign GDP are completely offset by higher domestic demand in the foreign countries as they cut interest rates.

Figure 5 also shows our benchmark case in which 20 percent of the world economy consists of countries that peg to the dollar. The nominal interest rates of these countries decline in lockstep with U.S. nominal interest rates, which exerts a highly stimulative effect on their consumption and investment spending. Notwithstanding the modest share of these countries (about one quarter) in the foreign aggregates shown in the figure, it is evident that aggregate foreign GDP shows a very pronounced rise. Interestingly, although the real exchange rate of the foreign sector appreciates persistently, it must eventually revert to baseline, which forces the price level to decline, and foreign output to fall below its pre-shock baseline.⁵

Returning to Figure 4, the different foreign output responses derived under the alternative assumptions about monetary policy in the dollar bloc countries translates into a sizeable disparity in the initial response of the oil price in our model. In the case in which all countries follow the Taylor rule, lower world output (mainly because of the large contraction in

⁵ Because the U.S. aggregate demand shock is stationary, all variables eventually return to their pre-shock level.

the United States) causes the oil price to fall almost 40 percent below baseline in the impact period, and roughly 10 percent after one year. By contrast, the oil price rises by around 20 percent initially in the benchmark case in which dollar bloc countries peg. The disparity in the oil price responses in the face of fairly modest differences in the response of world GDP reflects that the oil price elasticity of demand is extremely low in the short-run in our model, in the neighborhood of only 0.01 percent in the impact quarter of the shock (consistent with a half life of adjustment to a relative price change of 10 years).

But even if pegged exchange rates in some trading partners induced an initial rise in oil prices by as much as suggested by our model simulation, a key implication of our model is that this channel cannot account for permanent or even persistent increases in the oil price in response to accommodative U.S. monetary policy. In particular, the oil price rise under our benchmark case is wholly attributable to a temporary (even if somewhat persistent) rise in foreign output gaps. Thus, agents in the model forecast that most of the oil price increase will be reversed within a couple of years. Insofar as a salient feature of the observed increase in oil prices during the past five years is that it appears to have been perceived as largely permanent (based on inferences from futures markets and private forecasts), this casts strong doubt on the hypothesis that U.S. monetary loosening contributed markedly to the runup in oil prices. Because our structural models suggest that oil price shocks must be highly persistent to exert much effect on U.S. core inflation and output, it seems unlikely that oil price increases induced by the policy response abroad could have much impact on U.S. output and core inflation.

Not only are the monetary policy responses to an aggregate demand shock unlikely to generate a persistent runup in oil prices, but even their short-term impact on oil prices might be smaller than shown in the model simulations. First, some of the large quantitative effects shown

in Figure 4 simply reflect that the shock to the United States is both large in magnitude and occurs very rapidly, as U.S. GDP contracts a whopping 4 percent in a period of one year. With some phasing-in of the shock, the initial effects on oil prices – and in particular, the differences between the simulations – would be much less pronounced. Second, our model does not allow for oil inventories or variable supply capacity. In the presence of these features, any perceived fall in oil prices in the future (due say to a winnowing of the foreign output gap) would result in an incentive to sell inventories or increase production, hence limiting the initial rise in the oil price relative to the increase depicted in Figure 4. Finally, we note that our imposition of a 10 year half-life of adjustment also contributes to a much larger oil price rise after an increase in world GDP than suggested by some empirical estimates. In particular, while our calibration suggests that a 1 percent rise in world GDP would push up the real price of oil by over 50 percent on impact, this is roughly ten times as large as estimated by Kilian in a recent paper that uses a structural VAR framework to identify various shocks affecting oil prices.⁶

Altogether, these considerations caution against interpreting our simulation results as indicating that the monetary policy of the dollar bloc can have very large effects on the short-run response of the oil price. Moreover, the robust message of our simulation is that given that the stimulus to foreign output from a peg in the dollar bloc is temporary, any associated rise in the oil price must also be transient.

Other Explanations for the Runup in Oil Prices

We next turn to using our model to consider the quantitative effects of other shocks that may have exerted a pronounced effect in driving up world oil prices during the past few years. It

⁶ “Not All Oil Shocks are Alike: Disentangling Demand and Supply Shocks in the Crude Oil Market” (2003), *American Economic Review*.

seems reasonable to focus attention on two particular explanations. First, it seems plausible that faster-than-expected growth in world output – especially in developing economies such as China and India – may have made an important contribution to driving up oil prices. Second, growth in world oil supply has slowed markedly, and projections for the future level of oil production have been revised downward dramatically since the early years of this decade.

Figures 6 and 7 report the effects of a SIGMA simulation in which foreign real GDP growth initially rises about 1.5 percentage points relative to baseline due to faster growth in technological progress. Given that the technology improvement occurs only in the foreign countries, this is consistent with a rise in world GDP growth of a little more than one percentage point. The size of the shock seems plausible in light of the surprisingly fast world GDP growth that occurred earlier in this decade. In particular, world GDP growth as estimated by the IMF's WEO rose from about 4 percent per year in 2003, roughly its historical average over the preceding two decades, to an average pace of over 5 percent per year in the 2004-2007 period. Although explicit longer-term forecasts for world growth are not provided in the WEO, our reading of the evolution of short-term world growth forecasts and the associated commentary in successive editions of the WEO over the 2003-2007 period is that much of the faster growth was a surprise, and was eventually reflected in upward revisions to projections for potential growth in China and some other key economies.

Figure 6 shows that the shock eventually pushes up the level of world GDP by a little more than 30 percent over the 30 year simulation horizon depicted (even though U.S. GDP actually declines a bit, as the stimulative effect of an improvement in real net exports is offset by higher real interest rates, which depress U.S. investment for a prolonged period). The higher level of world GDP in turn causes oil prices to rise both persistently and by a large amount. By

the end of the simulation horizon, the oil price levels out at nearly 70 percent above its baseline value. The magnitude of the increase reflects our assumption of a long-run demand elasticity of 0.5 for oil and the rise in world GDP of over 35 percent. The responses in the figure are virtually indistinguishable whether or not the dollar bloc pegs to the U.S. dollar or follows an independent Taylor rule. This reflects that the two alternative policies imply very similar paths for the real interest rate in the dollar bloc

The initial rise in the oil price is a bit larger than the long-term response, but is still comparable in magnitude. The fact that the growth rate shock generates a nearly flat response of the oil price is instructive as regards the types of “fundamental” shocks that can plausibly account for both the rise in spot oil prices as well as longer-term futures prices that has occurred since roughly 2003. In particular, the growth rate shock produces a persistently elevated level path precisely because substitution away from oil associated with higher prices is almost completely offset by increased demand stemming from the increase in activity.

Our analysis also suggests that adverse supply growth shocks may work in a parallel fashion to generate a highly persistent rise in oil prices, provided these shocks are sustained. World oil production grew at a historical rate of roughly 2 percent per year through the first few years of this decade, but has subsequently declined to only about $\frac{1}{2}$ percent per year due to particularly disappointing supply responses in non-OPEC countries. Moreover, while the limited forecasts of long-term oil supply available from the early part of this decade seemed consistent with a projection that oil supply would continue to expand roughly in line with its historical average, recent projections (including qualitative assessments) suggest a dismal outlook for growth in global supply. Notwithstanding that oil prices remain more than double their level of a few years ago, many analysts now project that the poor growth performance of the past few years

will continue in the longer-term. The 2008 World Energy Outlook projects that world crude oil output will be 75 million barrels per day in 2030, a marginal increase relative to the 70 million barrel per day produced in 2007.

Accordingly, Figures 8 and 9 investigate the implications of a persistent decline in the growth rate of world oil production of about 1-1/2 percentage points (that dies away very gradually, similarly to the productivity growth shock). The contraction in world supply of over 20 percent after 30 years causes the oil price to rise nearly 40 percent by the end of the simulation horizon. The path of the oil price is relatively flat, as substitution away from oil due to higher prices is roughly counterbalanced by continued falls in supply. The results are little changed even if the dollar bloc follows a Taylor rule instead of pegging to the U.S. dollar.

Finally, it is interesting to consider the combined effects of faster-than-expected world GDP growth and weaker-than-expected growth in supply. This simulation is presented in Figure 10. The simulation indicates that the combined shocks can account for more than a 100 percent rise in the oil price in the long-run. The simulation reported by the dashed lines in Figure 10 considers the effects of the same shocks with a lower long-run price elasticity of demand for oil, equal to 0.3, still in the range of empirical estimates. In that case, the oil price rises as much as 200 percent in the long run.

As highlighted above, our modeling framework lacks certain realistic features such as oil inventories and variable capacity in oil supply. However, these features should not influence the long-run oil price response to persistent shocks. The main message is that the combined effects of faster-than-expected world GDP growth and weaker-than-expected growth in supply can account for a large and basically permanent jump in the oil price.

IV. How Rigid is the Dollar Bloc?

It has become fashionable in recent years to refer to emerging market countries, especially in East Asia, as comprising a “dollar bloc” or participating in a “Bretton Woods II” system of currencies pegged against the dollar.⁷ Various motivations for such policies on the part of the emerging market economies have been offered, including the desire to keep their currencies competitive and to avoid the adverse effects of exchange rate fluctuations on the balance sheets of domestic firms and households. Assertions that emerging market currencies are linked to the dollar have been supported by studies showing that, compared with countries with obviously floating exchange rates (the United States, Japan, Australia), many emerging market countries have less variable exchange rates and more variable reserves and interest rates.⁸

However, many of these studies were undertaken several years ago, when many emerging market economies were still rebuilding reserves after their financial crises and relying on their external sectors to support economic activity. Over the past several years, many emerging market countries, including those in East Asia, appear to have allowed greater flexibility in their exchange rates. Moreover, although there has been a mounting consensus that currencies officially described as “floating” may often be more tightly managed, researchers have not succeeded in achieving consensus in categorizing *de facto* exchange rate regimes. Different but equally plausible methodologies frequently yield different categorizations of exchange rate regimes, and some categorizations appear counterintuitive. For example, Ilzetzi, Reinhart, and Rogoff (2008) categorize the exchange rate regime for the United Kingdom’s sterling as “*de facto* managed crawling peg against the euro,” even though the United Kingdom has not intervened in foreign exchange markets for quite some time.

⁷ See, among others, Dooley, Folkerts-Landau, and Garber (2003, 2004) and Mann (2004) .

⁸ See, among others, Calvo and Reinhart (2002), Hausmann, Panizza, and Stein (2001), and Reinhart and Rogoff (2004).

We have no hope or intention of resolving the complexities inherent in trying to categorize currency regimes. However, we believe that the evidence undercuts the view that a preponderance of emerging market economies—especially in Asia—are effectively pegged to the dollar and thus must rigidly follow U.S. monetary policy.

Figure 11 displays the variance of monthly percent changes in countries' nominal exchange rates against the dollar during the 2000-2007 period. A mix of emerging market and advanced economy currencies are shown, with the major developing East Asian currencies indicated by the cross-hatched bars. The charts make clear that Asian exchange rates against the dollar are indeed, with the exception of Indonesia, generally more stable than those of other countries. However, note that the currencies exhibiting the greatest variability are those of some fairly volatile emerging market economies, especially Argentina and Venezuela. Obviously floating currencies such as the pound and Canadian dollar are in the middle of the pack, and exhibit only a bit more volatility than the Korean won and Philippine peso. In sum, neither the developing East Asian currencies, nor the currencies of emerging markets more generally, appear to represent a *bona fide* dollar bloc.⁹

Even if these countries were all pegged to the dollar, however, they would not necessarily have to follow U.S. monetary policy. The uncovered interest parity condition requires that in the case of perfect capital mobility and perfectly substitutable assets, a country's interest rate must equal that of another country, adjusted for expected movements in the exchange rate between the two countries' currencies. When one country pegs to another, expected exchange rate movements are zero, and thus the two countries' interest rates must be equal. But in cases where perfect capital mobility does not hold (e.g., with capital controls) and assets are not perfectly

⁹ In principle, of course, China could be considered a mini-dollar-bloc of its own.

substitutable (Malaysian assets may not be considered interchangeable with U.S. assets) the uncovered interest parity condition breaks down, and the scope for deviations in monetary policy among countries arises, even with pegged exchange rates.

Accordingly, it is not obvious that even for those countries whose currencies are most clearly linked to the dollar—e.g., China, Malaysia—that their monetary policies are more closely linked to that of the United States than the policies of other countries recognized to have independently floating exchange rates. Figure 12 presents the correlations of monthly percent changes in different countries' nominal policy interest rates with that of the United States over the period 2000-2007. Intriguingly, two of the economies whose interest rates are most correlated with the U.S. federal funds rate are Canada and the euro area, both of whom have what most analysts agree are floating exchange rates. Most of the developing Asian economies have interest rates that are less well correlated with those of the United States, especially the two countries with most obviously pegged rates: China and Malaysia. To make this point more concretely, Figure 13 shows how policy rates have moved in several countries compared with the U.S. federal funds rate.¹⁰

Thus, the evidence suggests that emerging market economies do not simply “import” their monetary policies from the United States. In fact, by and large, Asian policy interest rates appear surprisingly uncorrelated with U.S. rates. By contrast, and for reasons that are beyond the scope of this paper, policy rates in many major industrial economies with obviously floating currencies appear far more closely tied to U.S. rates.

¹⁰ The policy interest rates—generally short-term money market rates—used in our analysis may not fully mirror the stance of monetary policy in some of the countries being studied. However, to the extent that some countries rely on other instruments of monetary policy—e.g., deposit and loan rates or direct guidance on credit—this reinforces the independence of monetary policy from that in the United States, even with a currency pegged to the dollar.

V. Conclusion

In this paper, we assessed the view that, because many developing countries peg their currencies to the dollar, earlier this decade they were forced to loosen monetary policies in line with those in the United States, leading to economic overheating, increases in the demand for commodities, and thus sustained rises in commodity prices. Using the Federal Reserve staff's forward-looking, multi-country dynamic general equilibrium model, SIGMA, we found that even if many developing country currencies are indeed pegged to the dollar, an easing of U.S. monetary policy would lead to only a transitory runup in oil prices. The effect is short-lived both because loose monetary policy can keep output above its equilibrium level for only a limited period of time, and also because the runup in oil prices induces demand adjustments that subsequently allow prices to come down.

A key lesson of the simulation we ran is that it would take sustained and fundamental shocks to the demand and supply of oil to explain the persistent rise in its price through much of the decade. We then used SIGMA to analyze the effects of two shocks that we believe are more firmly rooted in the fundamentals of demand and supply of oil: an increase in economic growth in many foreign countries, and a sustained shortfall in the growth of oil production relative to its earlier trend. In the simulations we ran, both of these shocks boosted the price of oil on a lasting basis, making them more plausible candidates for the earlier runup in oil and other commodity prices than the “dollar bloc” story of monetary policy and currency pegs.

Finally, we took a closer look at the underlying premise of the “dollar bloc” story, that the currencies of many developing economies are linked to the dollar sufficiently strongly that the monetary policies of these countries are forced to follow that of the United States. We found

that the currencies of many developing countries are less rigidly linked to the dollar, and their interest rates less correlated with U.S. interest rates, than is frequently assumed. These results further undercut the “dollar bloc” explanation for the past surge in oil and other commodity prices.

We should acknowledge, however, that we are far from having a complete understanding of the factors driving oil and other commodity prices in recent years. As noted above, the SIGMA model does not incorporate inventories or variable supply capacity, either of which would reduce initial magnitude of price responses to shocks. As well, there remains considerable uncertainty about the size of the price elasticity of demand for oil, both in the short and the long run.

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List of country abbreviations for figures:

AR- Argentina
BZ - Brazil
CA - Canada
CH - China
CL - Chile
CO - Colombia
CZ - Czech Republic
DN – Denmark
EU - Euro Area
HU - Hungary
ID - Indonesia
IN - India
IS - Israel
JA - Japan
KO - Korea, Republic of
MA - Malaysia
MX - Mexico
NO - Norway
PE - Peru
PH - Philippines
PK - Pakistan
PL - Poland
RU - Russia
SD - Sweden
SF - South Africa
SI - Singapore
TA - Taiwan
TH - Thailand
TK – Turkey
UK - United Kingdom
VE - Venezuela

Figure 1

Global Commodity Prices

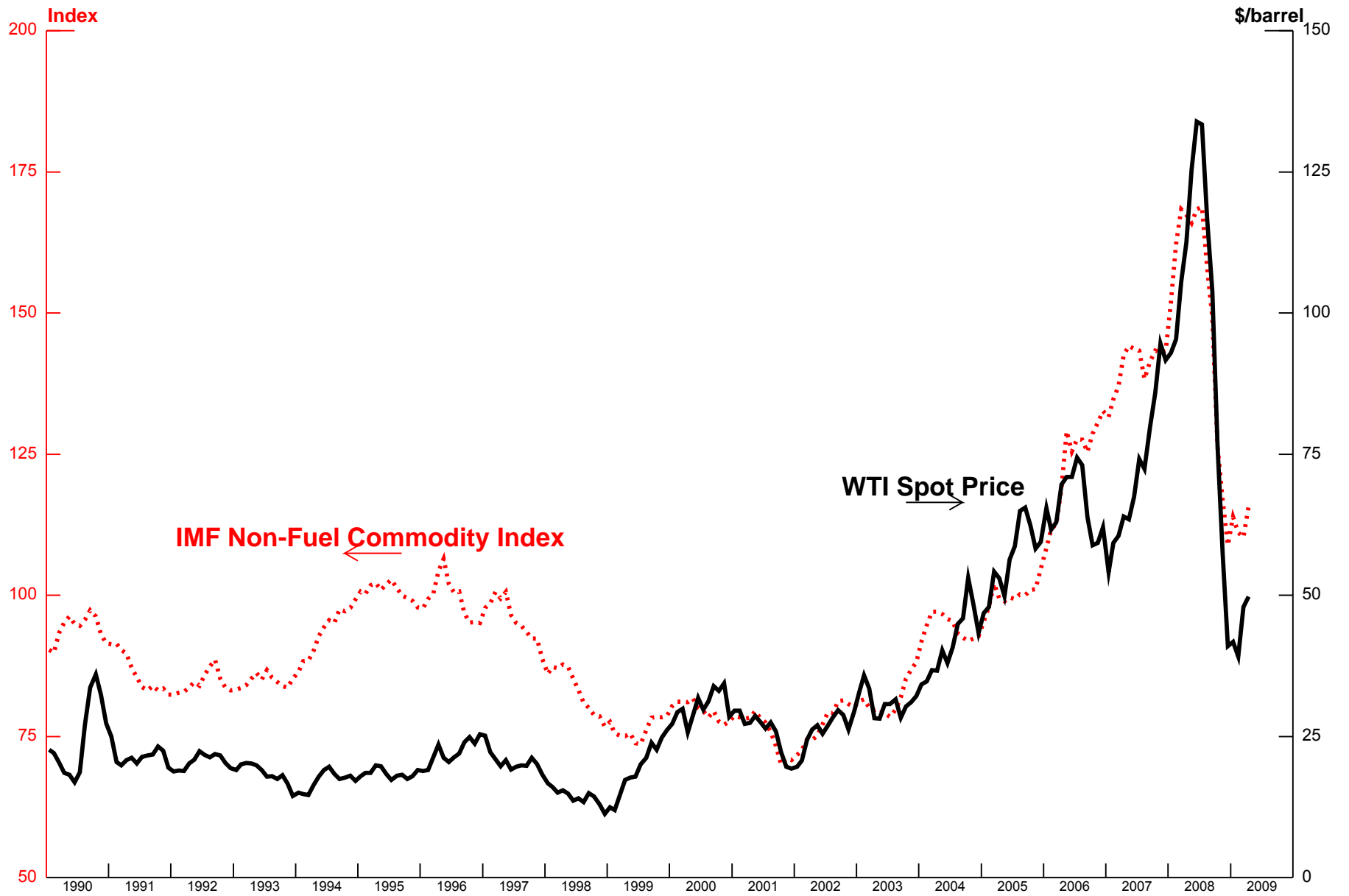
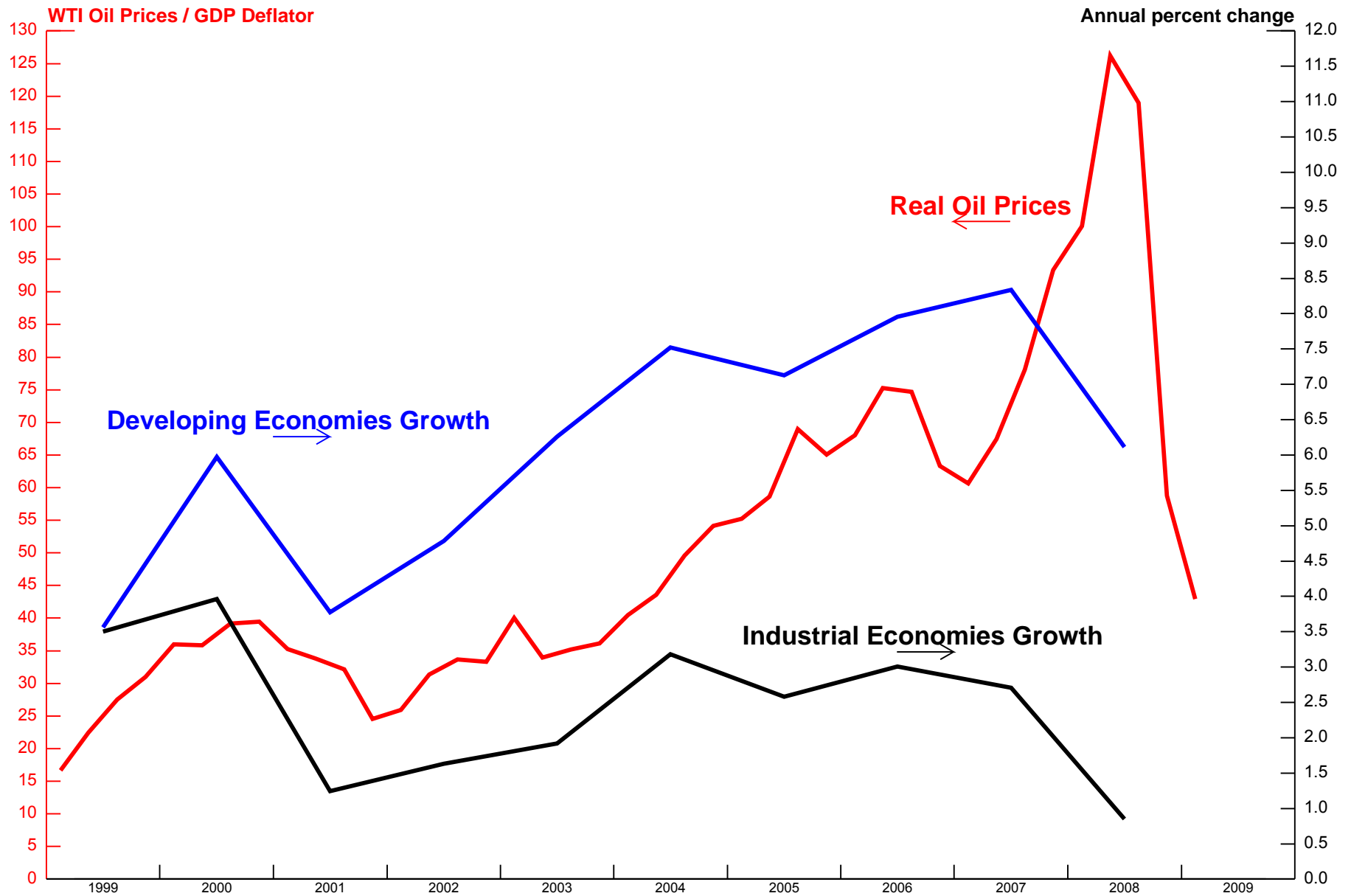


Figure 2

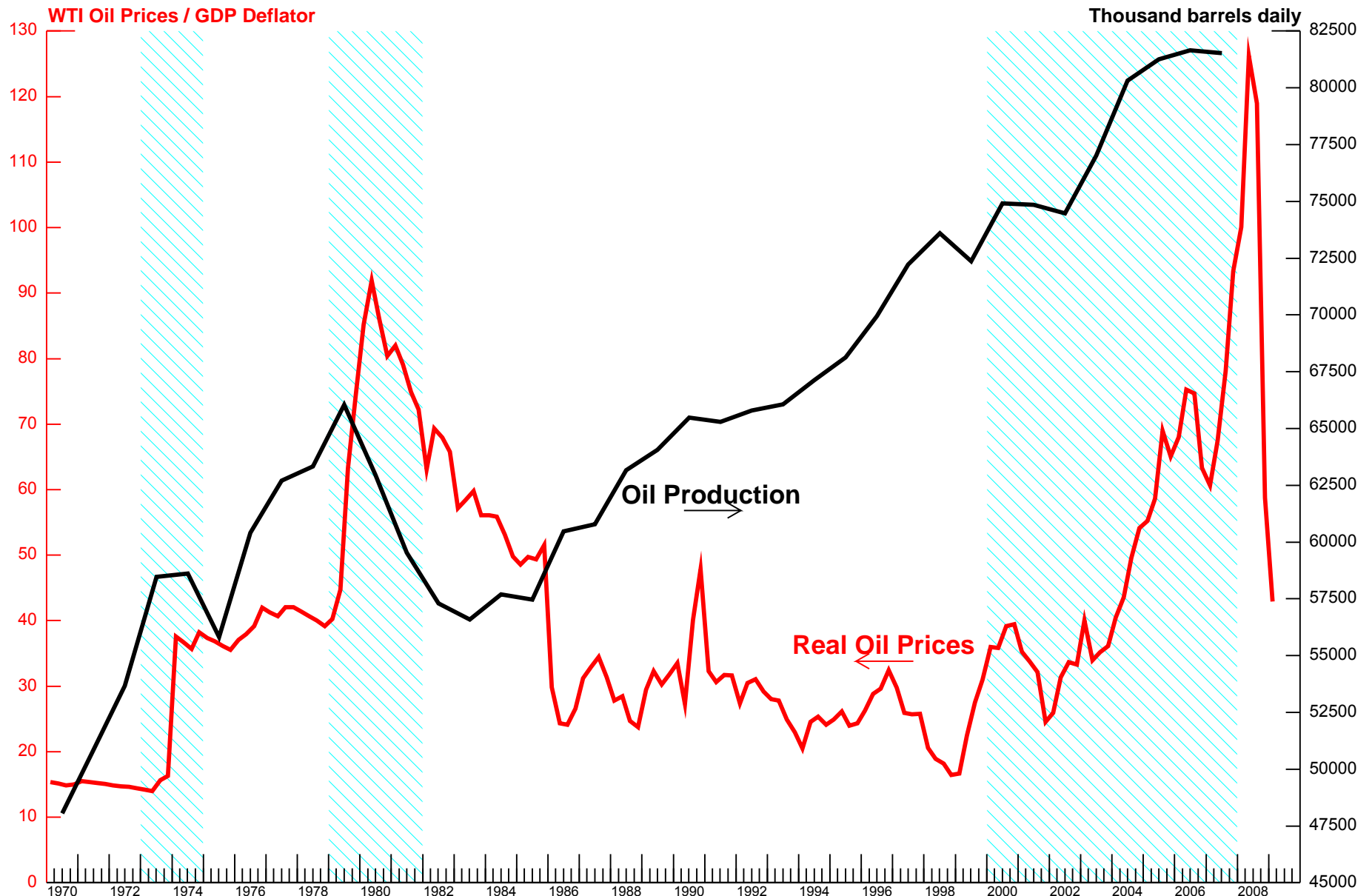
Recent Global Real GDP Growth and Real Oil Prices



Source: Wall Street Journal; Bureau of Economic Analysis; IMF WEO Database, April 2009.

Figure 3

World Oil Production and Real Oil Prices



Source: Wall Street Journal; Bureau of Economic Analysis; BP Statistical Review of World Energy, June 2008.

Figure 4: U.S. Aggregate Demand Shock

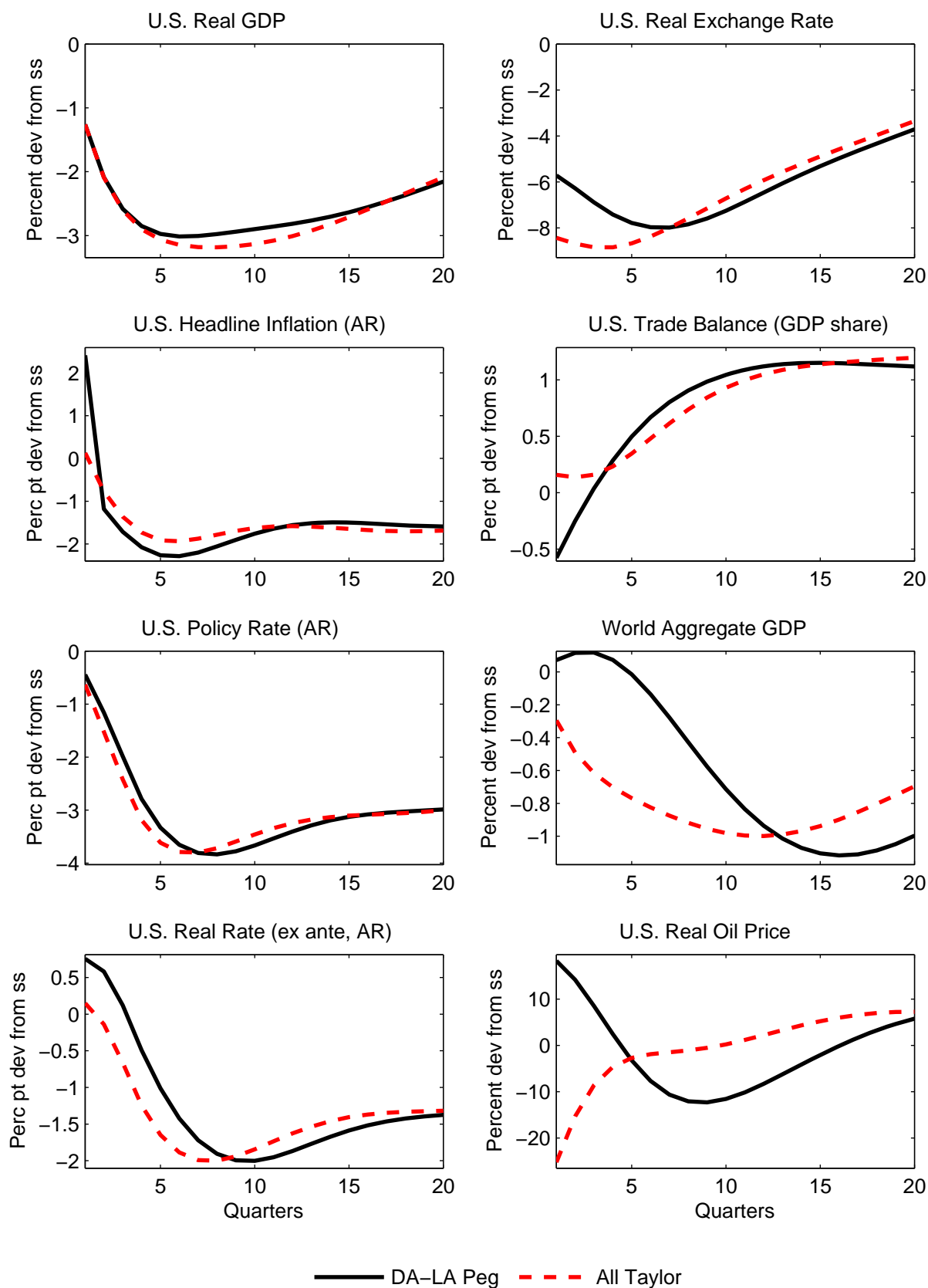


Figure 5: U.S. Aggregate Demand Shock

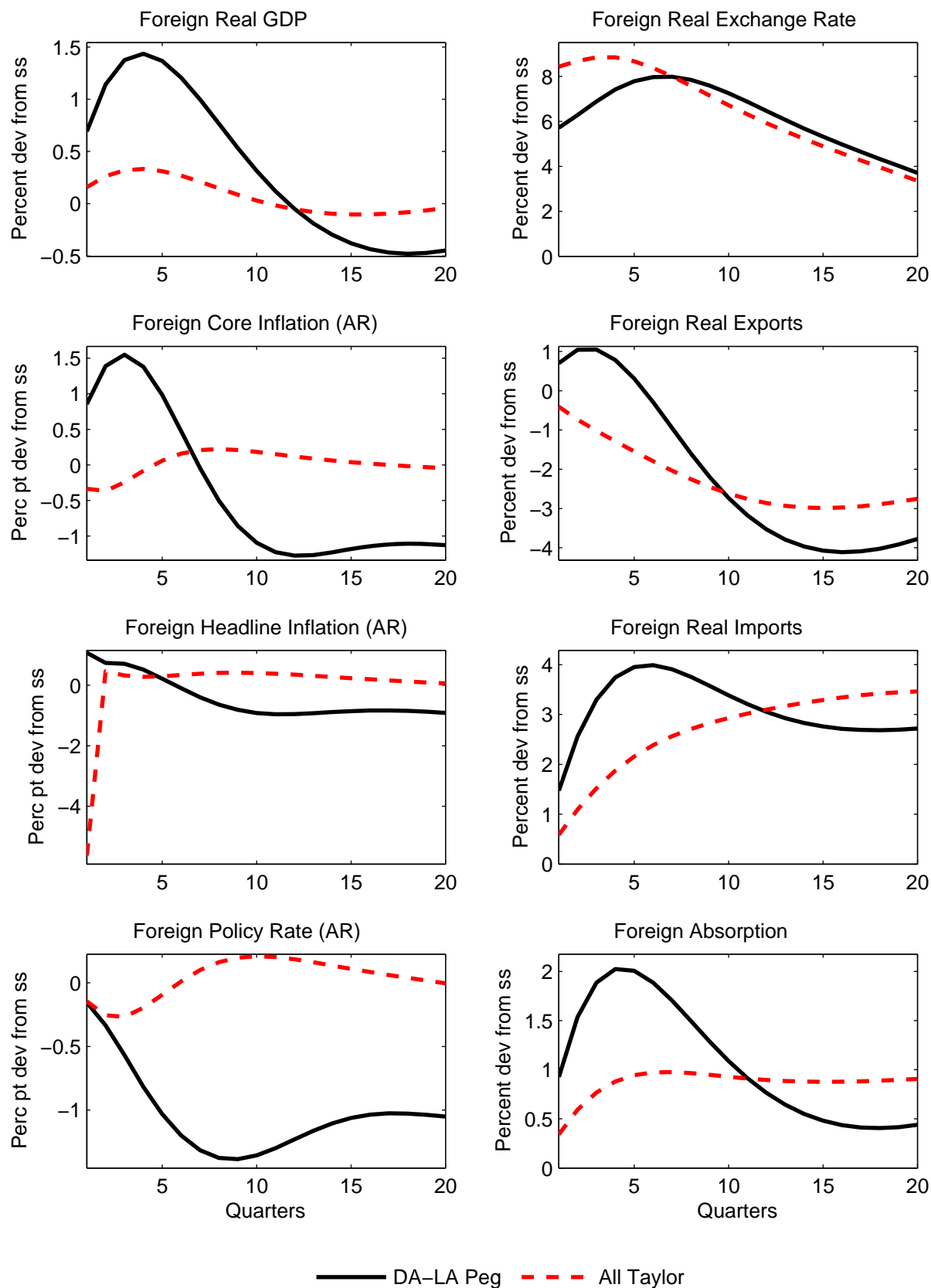


Figure 6: Foreign Technology Growth Shock

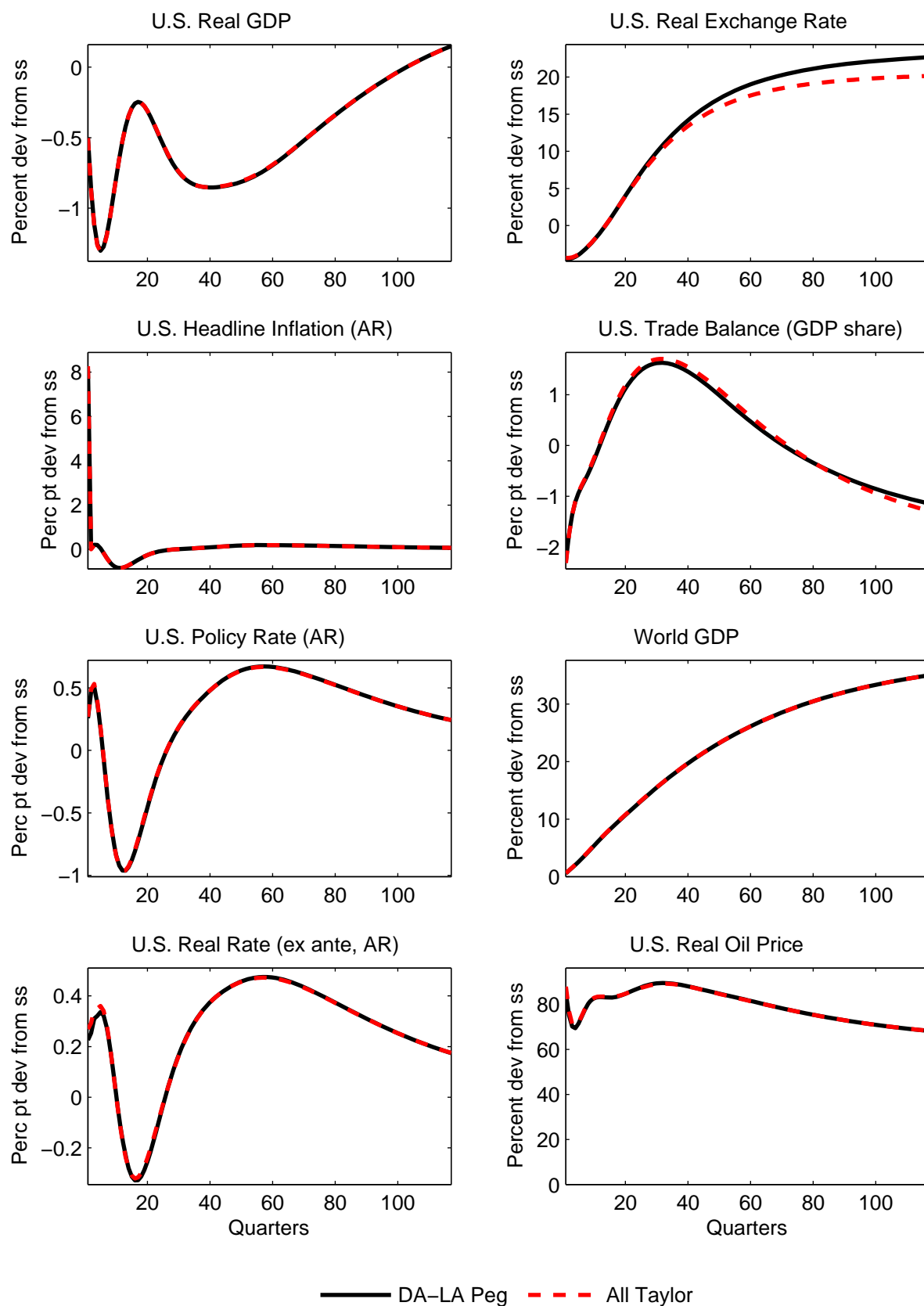


Figure 7: Foreign Technology Growth Shock

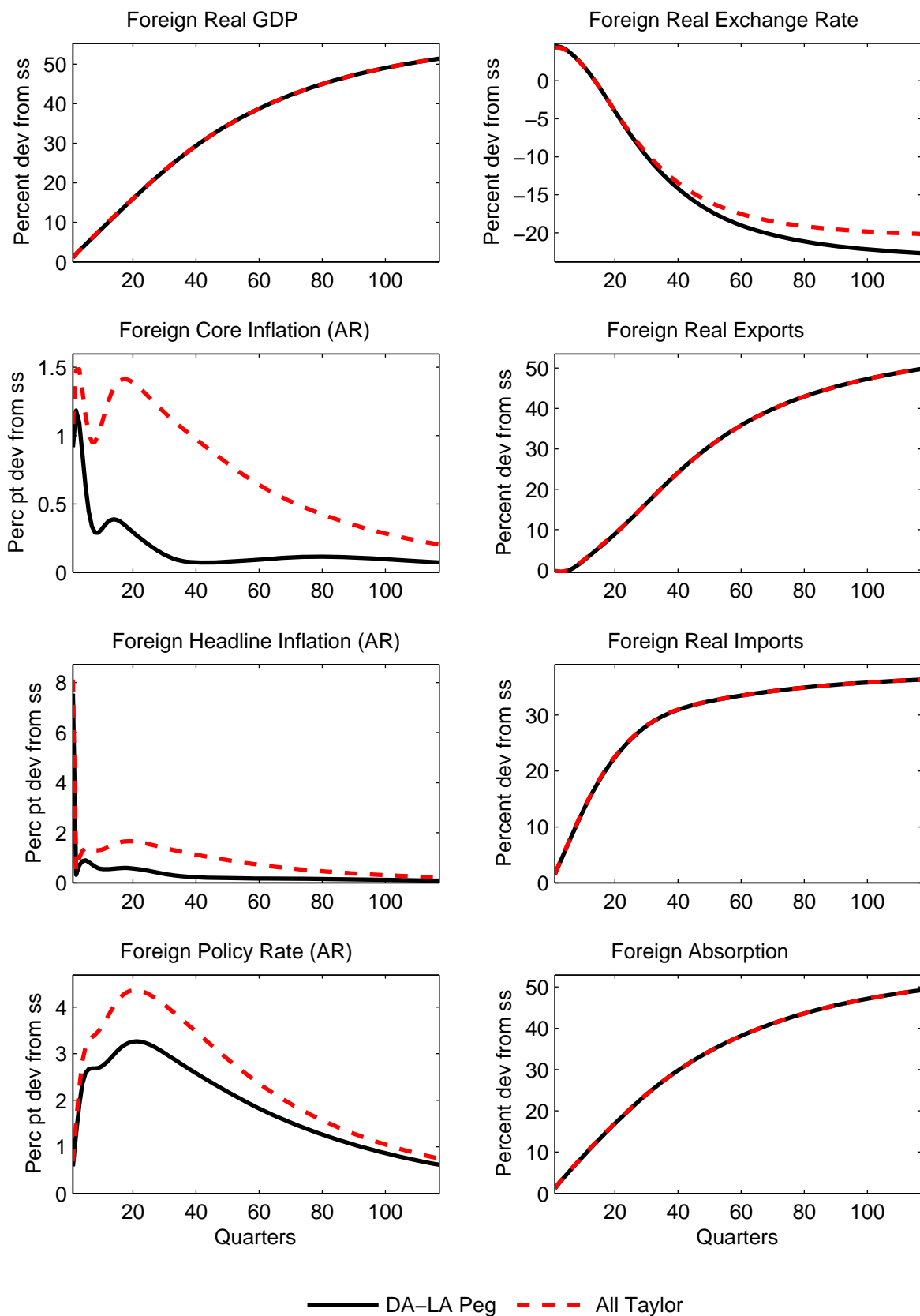
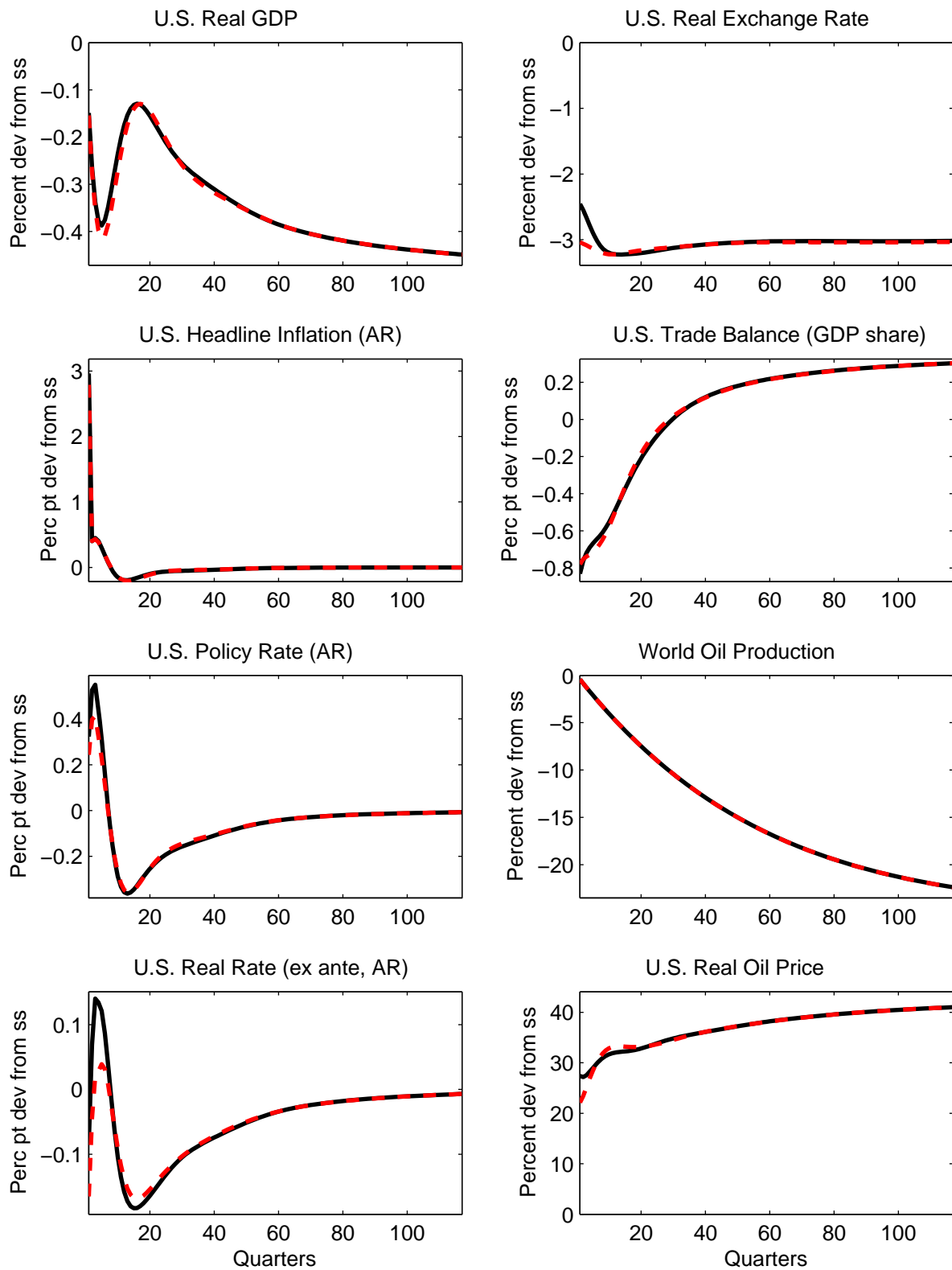


Figure 8: Oil Supply Shock in ROW Block



— DA-LA Peg - - - All Taylor

Figure 9: Oil Supply Shock in ROW Block

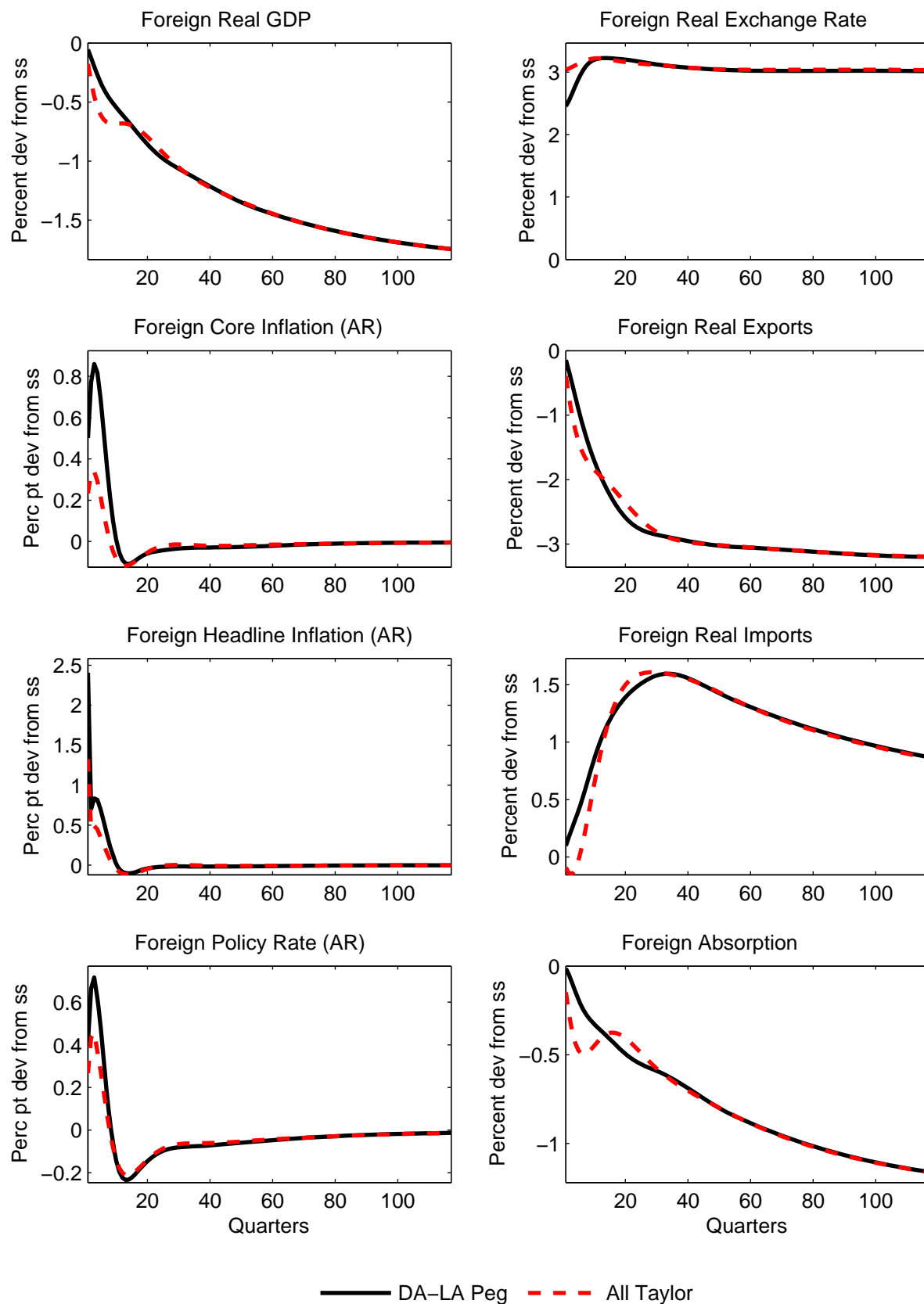


Figure 10: Foreign Technology Growth Shock and Oil Supply Shock in ROW Block (DA-LA Peg)

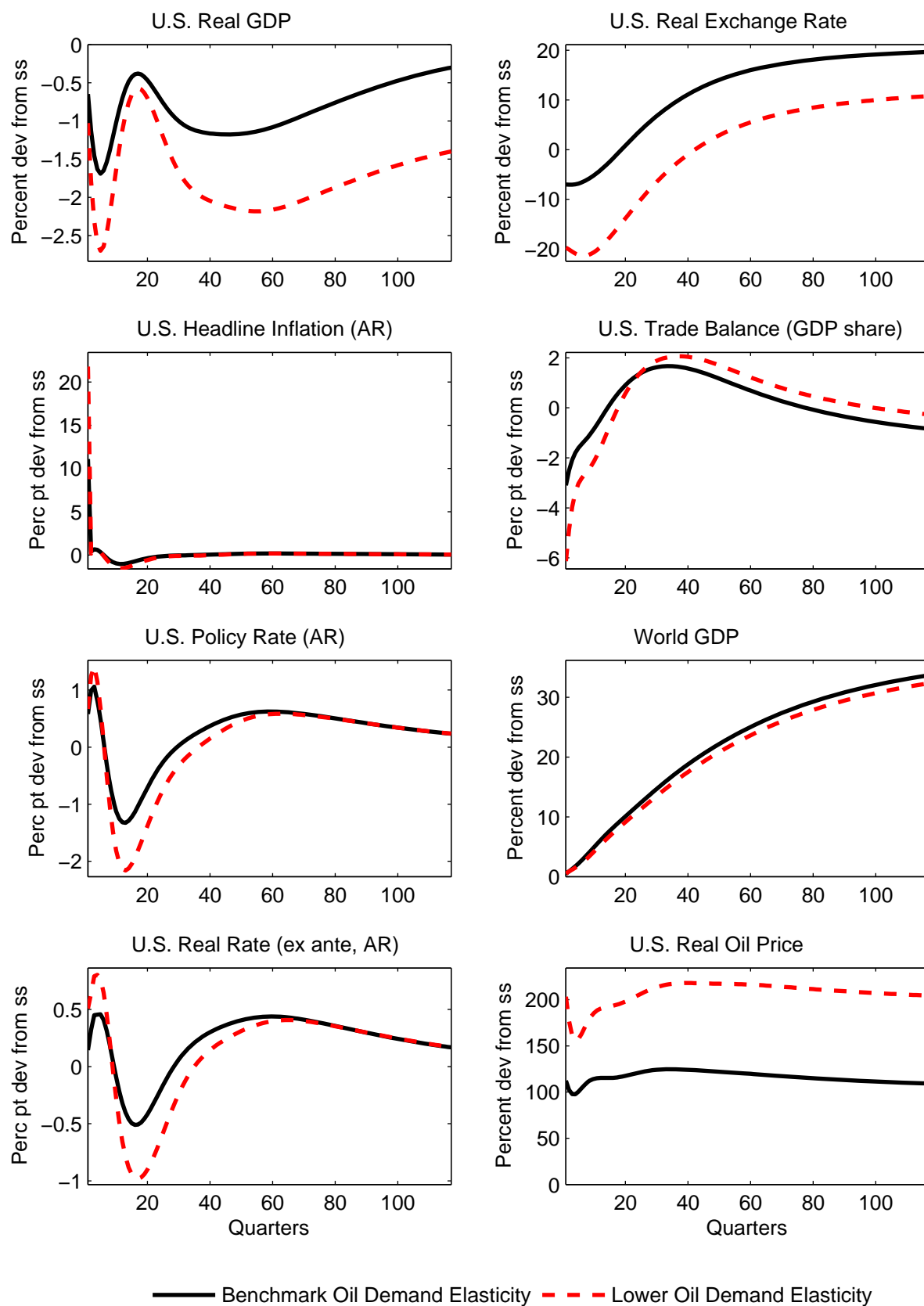
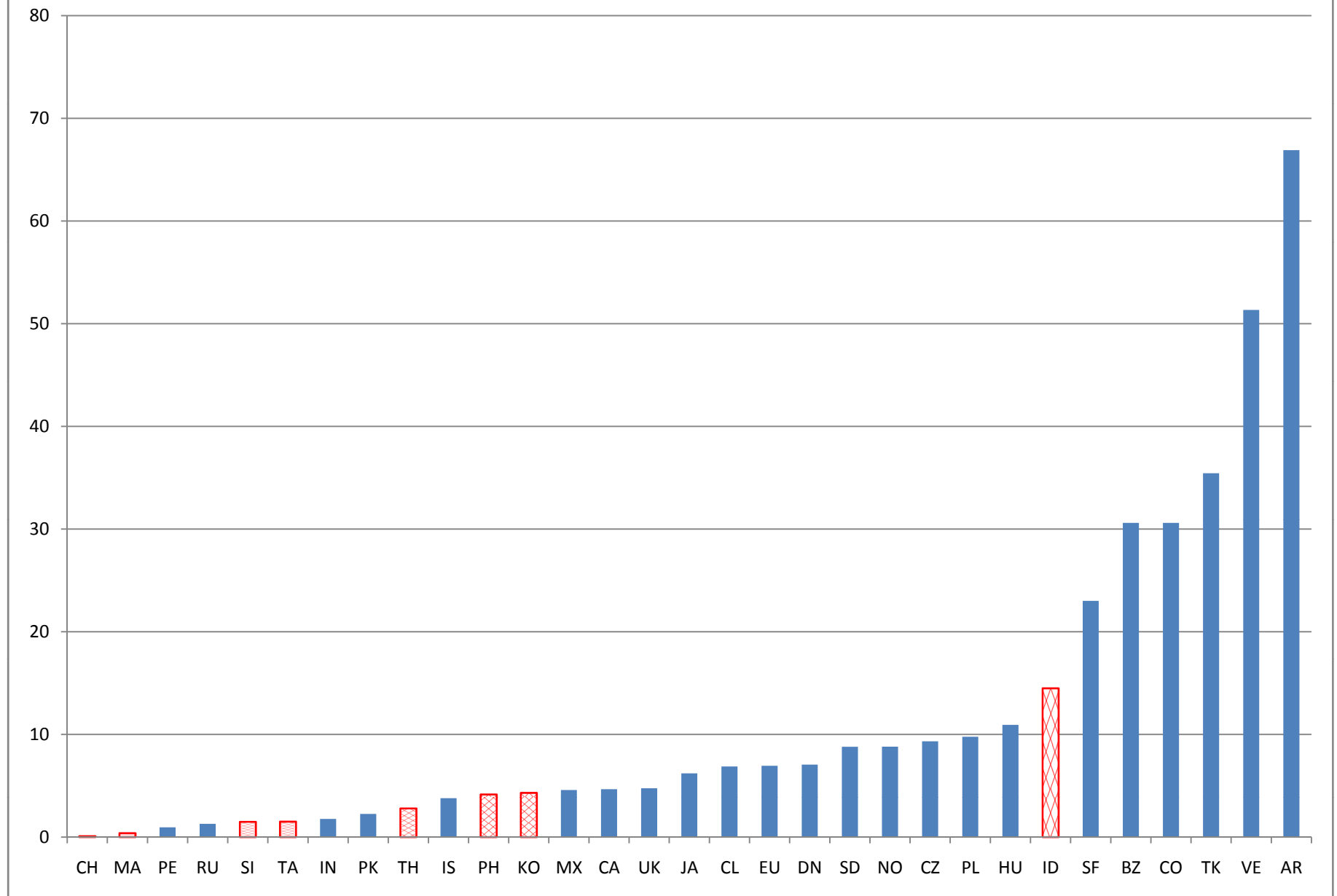
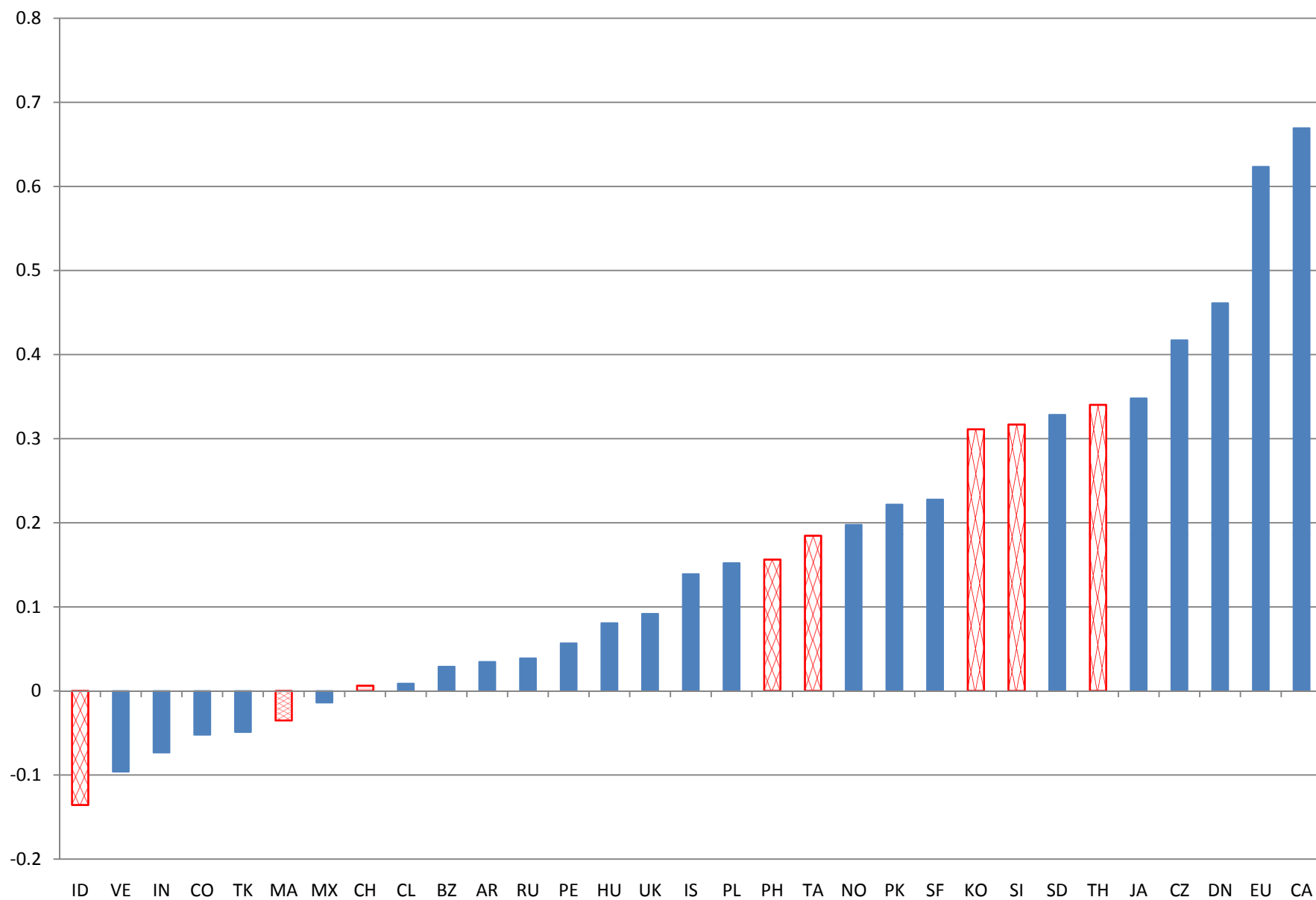


Figure 11: Variance of Percent Changes in Nominal Exchange Rate Against Dollar*



* Montly data, calculated over 2000-2007

Figure 12: Correlation of Nominal Interest Rate Changes with U.S. Rates*



* Monthly data on policy interest rates, 2000-2007

Figure 13: U.S. and Selected Developing Asian Interest Rates 2000-2007

