

US Economics Analyst

Economics Research

Lower Oil Prices: Still a Boost, but not All Gravy

- Oil prices have declined sharply over the past few months, falling roughly 25% from their average level during the first half of 2014. Our Commodities team expects the drop to be sustained. While lower oil prices would historically have been seen as a clear positive for the economy, the growing role of US energy production suggests at least a partial offset.
- For the consumer, we see the recent drop in gasoline prices as equivalent to a roughly \$75bn tax cut. Based on a simple back-of-the-envelope calculation, corroborated with a VAR analysis, we think the impact of lower energy prices through this channel should be a benefit of about 0.3 percentage point (pp) on GDP growth over the coming year. The total positive “tax cut” effect for the whole economy may be as much as +0.4 pp.
- However, the energy sector is more important to the US economy than it once was due to the shale boom. Based on the recent drop in prices, our Exploration & Production equity analysts anticipate slowing, but still positive, growth in production during 2015. Energy-related cap-ex should also slow a bit. The GDP growth headwind from this shift should be around 0.1 pp over the next year, mainly seen in a slightly wider petroleum trade deficit than would otherwise occur.
- The net effect of lower energy prices on employment should be positive. We do not anticipate job losses in the energy sector to move the needle significantly on aggregate employment outcomes. While energy sector jobs have grown at a rapid rate, they remain a small share of total US employment. Any energy industry job losses due to lower oil prices would probably be more than made up for with diffuse growth-induced job gains elsewhere.
- Our bottom-up analysis suggests a net positive impact of lower oil prices on GDP growth of around 0.2 to 0.3 pp over the coming year. A cross-check with the Fed’s FRB/US model suggests a slightly smaller, but still positive, effect. While modest in size, we think this tailwind should offset much but not all of the growth drag from the stronger dollar and a slightly dimmer global growth outlook.

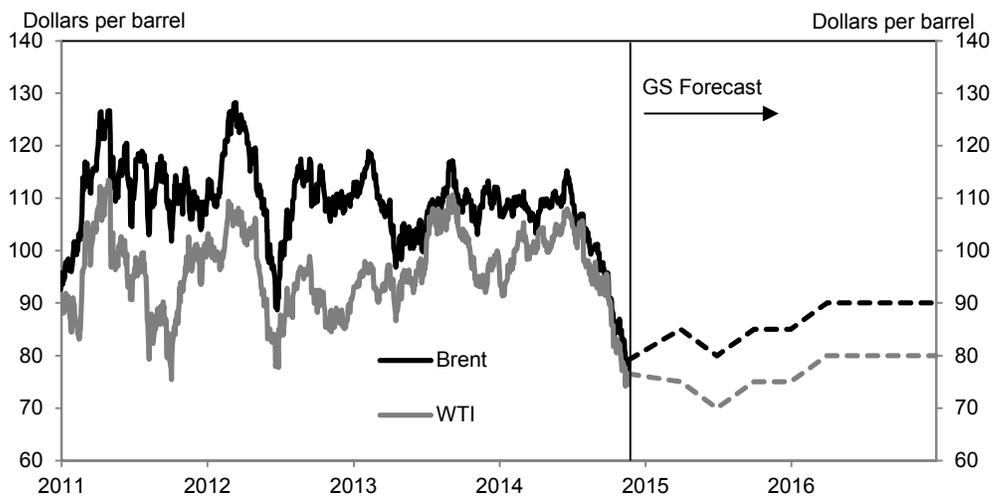
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Lower Oil Prices: Still a Boost, but not All Gravy

Oil prices have declined sharply over the past few months, falling roughly 25% from their average level during the first half of 2014. Our Commodities team attributes the price drop mainly to supply factors, including strong US production, a détente of geopolitical supply concerns, and strategic behavior of core OPEC, but also to softer expectations for global demand growth and market technical factors.¹ As shown in Exhibit 1, we expect lower oil prices to be sustained over the coming year, which would have historically been considered a clear positive for the economy. However, the fact that the US is now a larger energy producer than it has been at any time in its history raises the question of whether lower prices could actually be a net negative for the economy.²

In this week's *Analyst*, we take a detailed look at the potential impact of lower energy prices for the outlook. Remembering that $GDP = \text{consumption} + \text{investment} + \text{government spending} + \text{net exports}$, we review the different channels through which lower oil prices could influence GDP. In short, we find that lower energy prices are still a positive for growth, although less positive than they might have been 20 years ago. Consumer spending still benefits from lower oil prices, but offsetting drags on energy-related business fixed investment and net exports are likely to be larger factors today.

Exhibit 1: Oil Prices Have Fallen Sharply



Source: Department of Energy. Goldman Sachs Global Investment Research.

Lower Gasoline Prices will Benefit Consumer Spending

US consumers spent \$370 billion on gasoline last year. Coincident with the decline in oil prices, seasonally-adjusted gasoline prices have moved about 13% below their average for the first half of the year.³ In light of lags in the adjustment of retail gasoline prices to lower oil prices—which are particularly long when prices fall rather than rise—we would

¹ See Damien Courvalin, "OPEC Loses Pricing Power," *The New Oil Order*, October 26, 2014.

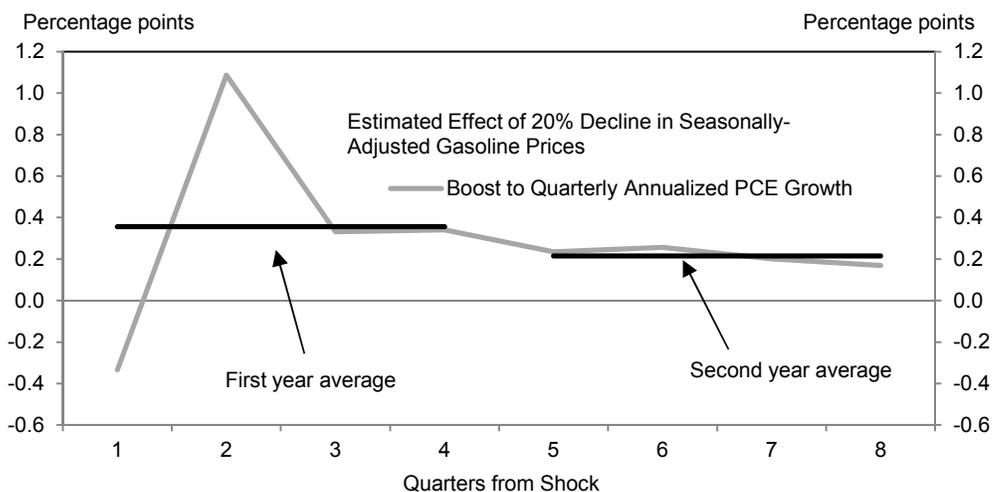
² We have argued in the past that the drop in energy prices will benefit the consumer and that the drop in prices should have modest implications for the US cap-ex outlook. See Jan Hatzius and David Mericle, "Real Income Stages a Nice Rebound," *US Daily*, October 22, 2014 and Alec Phillips, "Lower Energy Capital Spending Should Have Only a Small Effect on Growth," *US Daily*, October 28, 2014.

³ Gasoline prices normally decline from May through December each year. The portion of the recent decline in prices that can be explained through normal seasonal variation should not have a significant effect on seasonally-adjusted macroeconomic data.

eventually expect seasonally-adjusted gasoline prices to decline at least 20%. As such, the recent drop in oil prices is likely to provide a roughly \$75bn windfall in discretionary income. Assuming that around 50% of the windfall is spent over the next year, this would represent a bit more than a 0.2 percentage point (pp) boost to GDP growth, ignoring both offsets from lower net exports and multipliers via the labor market.⁴

As a cross check on this rough back-of-the-envelope calculation, we estimate a vector autoregressive (VAR) model including consumer spending, gasoline prices, and interest rates.⁵ Exhibit 2 shows that a 20% drop in gasoline prices should boost total real PCE by three- to four-tenths over the next year, translating to two- to three-tenths on real GDP growth.⁶

Exhibit 2: Lower Gasoline Prices are a Boon for the Consumer



Source: Goldman Sachs Global Investment Research.

While the positive effect on consumer spending probably represents the largest and most important boost to the economy from lower energy prices, we see a modest additional benefit from lower home heating oil costs and lower fuel costs faced by business and government buyers. As a result, we nudge up our estimate of the “positives” from lower energy prices to as much as +0.4pp.

Offsets via Net Oil Imports and Energy Cap-ex

Against these positives, lower energy prices will have a negative impact on the energy-producing sector of the economy, which has grown rapidly in importance as a result of the shale boom. In particular, the negative offsets could come through two main channels: lower production—which would primarily show up in lower net exports as less consumption of foreign oil is displaced by US production—and lower-energy cap-ex.

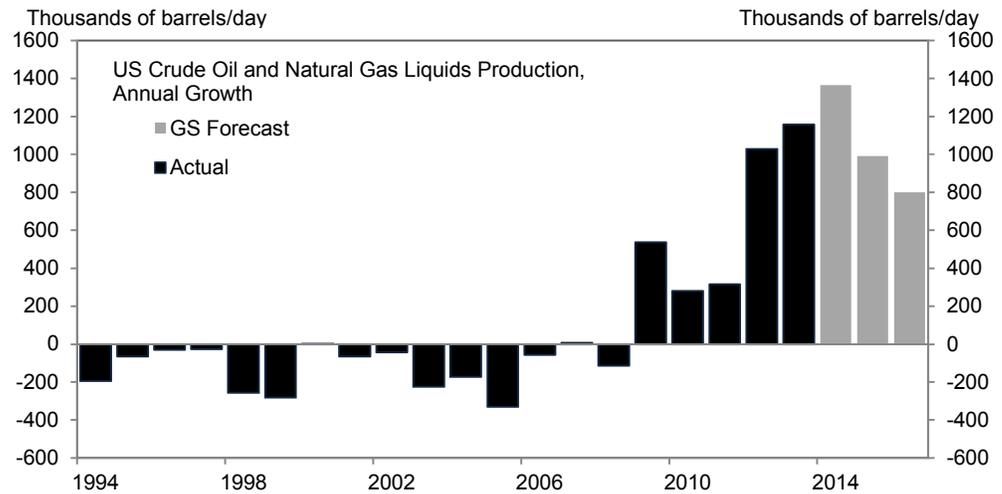
⁴ For example, we previously estimated that about 50% of the income windfall from the 2008 tax cuts was spent over a couple of quarters. See Seamus Smyth, “Yes, the 2008 Rebates ‘Worked’,” *US Daily*, February 25, 2009. Our standard consumption model predicts that 25% of an increase in income passes through to higher consumer spending after two quarters, rising to roughly 100% in the longer term.

⁵ The ordering in the VAR allows gasoline prices to have an effect on consumer spending within the same quarter, but not vice versa. The model is estimated on twenty years of quarterly data.

⁶ This is similar to our past estimate that a 10% drop in energy prices might increase the consumption contribution to GDP growth by between one- and two-tenths over the next year. See Sven Jari Stehn, “Rising Oil Prices—So Far, Only a Modest Hit to Growth,” *US Daily*, February 23, 2011.

In light of the drop in oil prices, our Exploration & Production equity analysts expect roughly 400kbpd less growth in US oil production by the fourth quarter of 2015.⁷ Nonetheless, we still anticipate net growth in production. Although prices are now nearing the level at which a number of shale plays look uneconomical, we believe the required quantity adjustment to bring the market back into equilibrium is fairly modest, meaning that the amount by which production must be pared back is relatively small.

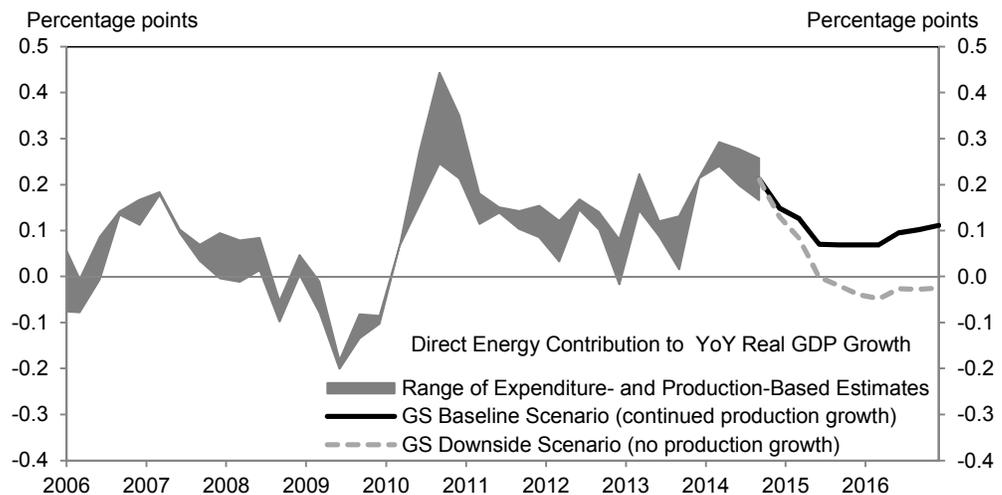
Exhibit 3: US Energy Production Should Still Grow Despite Lower Prices



Source: EIA. Goldman Sachs Global Investment Research.

Slower growth in production should result in a smaller, but still positive, GDP impulse from the energy-producing sector. The gray shaded region of Exhibit 4 represents the contribution of the energy sector to GDP growth estimated in two different ways. First, we construct a “production-based” estimate, using data on growth in the real quantity of

Exhibit 4: Direct GDP Boost from Energy Should Slow



Source: Goldman Sachs Global Investment Research.

⁷ With cuts in cap-ex taking roughly six months to influence production, we do not expect any significant effect on 2014. For further detail on the production forecasts, see Brian Singer, “Shale Scaleback: Less Room for US Oil Growth Reduces Upside, Now Neutral,” *Americas: Exploration & Production*, October 26, 2014.

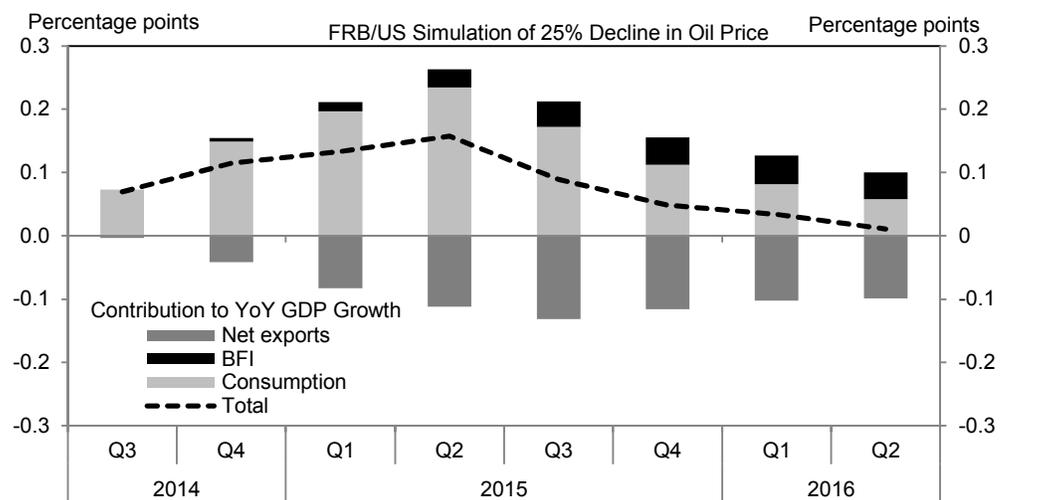
energy sector output weighted by value added to GDP.⁸ This is intended to be a fairly raw read on the real value of energy produced in the US. Second, we produce an “expenditure-based” estimate, adding up the growth contribution from energy-related expenditure categories—including changes in the petroleum trade balance as well as energy-related business fixed investment. The exhibit shows that the contribution from the energy sector to economic growth over the past year has been around +0.2pp.

We next use a simple regression model to relate the GDP growth contribution to growth in US energy production.⁹ For the forecast period, we use our Commodities team’s projections for US oil and natural gas production in 2015 and 2016. The black line shows our projection under the baseline production forecast included in Exhibit 3. The boost from the energy sector moderates from around two-tenths per year to a bit less than one-tenth per year, representing a small headwind to growth. For comparison, we also show a downside scenario assuming no growth in US energy production. Intuitively, in this scenario the contribution to GDP growth is close to zero (a slight negative).¹⁰

Fed’s Model Also Suggests Net Growth Benefit

Weighing the positives against the negatives, we come out with a net growth impulse of around 0.2 to 0.3 pp over the next year from lower energy prices. As a further check on this result, we use the Fed’s large-scale FRB/US macroeconomic model to simulate the effect of a 25% drop in oil prices. The net effect on GDP growth is shown in Exhibit 5, breaking out the contributions from net exports, business fixed investment, and consumer spending. Again, the positive impact on consumer spending, and to a much lesser extent (non-energy) business fixed investment wins out. Net exports present a drag, as stronger consumption growth pulls in more imports, while the net petroleum trade balance is less favorable than it would otherwise be. The growth boost suggested by FRB/US is qualitatively similar to our bottom-up analysis, but a bit smaller in magnitude.

Exhibit 5: FRB/US Simulation Suggests Positive Net Growth Effect



Source: Goldman Sachs Global Investment Research.

⁸ See Jan Hatzius, “The GDP Growth Effects of Increased Energy Supply,” *US Daily*, July 29, 2014.

⁹ We find that the production-based estimates result in a better historical fit, and so we focus on these estimates for the projection.

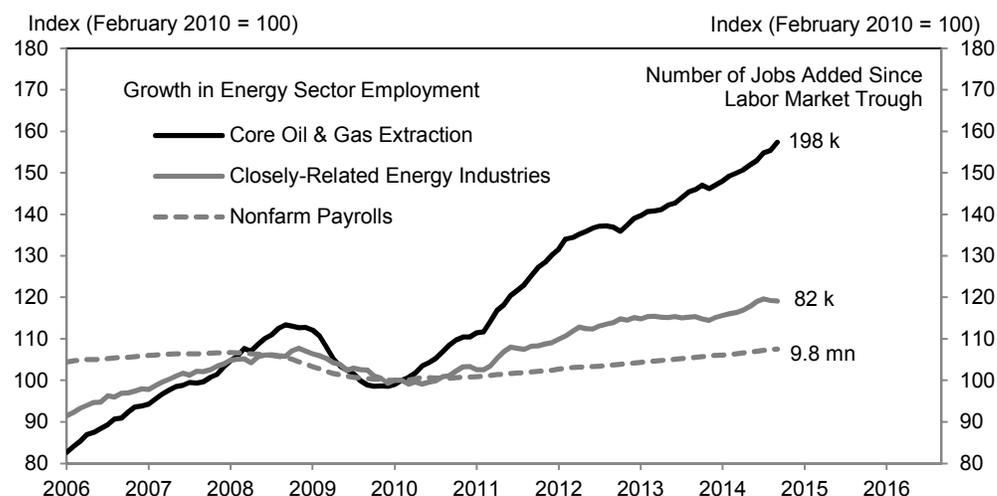
¹⁰ Taking a broader view, a downside production scenario would likely coincide with a downside price scenario, and hence a stronger GDP boost through the “tax cut” channel.

Net Employment Effect of Lower Prices Should be Positive

Finally, we assess the potential implications for employment. Stronger growth and the consequent boost to real incomes should result in a positive effect on overall employment. However, the decline in US energy production will also be a negative for energy-sector employment, with negative spillover effects to broader employment in local economies that are particularly reliant on energy production. We nonetheless think that the net of these two factors is a positive.

Exhibit 6 shows that energy jobs have grown much more quickly than other sectors of employment since the labor market trough but have nonetheless accounted for only a modest share of total job growth. Taking core oil and gas extraction jobs together with closely-related energy industries (pipeline construction, oil & gas field machinery manufacturing, etc.), the energy sector has added about 280k jobs since the labor market trough four years ago. For a sense of scale, this represents about 5k jobs per month (vs. average total job gains of 220k per month over the past year).

Exhibit 6: Energy Jobs Have Grown Quickly, but Small Share of Employment



Source: Department of Labor. Goldman Sachs Global Investment Research.

We think the potential for job losses in the energy industry to move the needle on the monthly payroll jobs report is limited. First, production should continue to increase, sustaining demand for workers. Second, energy production is a relatively capital (rather than labor) intensive activity. Third, there are substantial fixed costs to firing and having to re-hire workers—in other words, everybody won't be sent home as soon as WTI hits \$70/bbl. Indeed, to our knowledge, there have not been significant large-scale layoffs announced to date. Finally, any potential job losses in the industry would probably be phased in gradually over a number of months. That said, past oil price busts have had a significant local impact in oil-producing regions of the country, such as Texas in the 1980s.

A Small, but Welcome, Boost

Overall, our analysis suggests that the drop in energy prices should be a modest positive for the growth outlook, but likely less so than might have been the case historically. Implications for the labor market are also probably slightly positive despite a possible drag on energy-sector employment. Against a backdrop of increased concern about external sector developments, we see the boost from lower energy prices as a welcome tailwind that should offset much, but not all, of the growth drag from the stronger dollar and a slightly dimmer global growth outlook.

Kris Dawsey

The US Economic and Financial Outlook

(% change on previous period, annualized, except where noted)

	2013	2014	2015	2016	2017	2018	2014				2015			
		(f)	(f)	(f)	(f)	(f)	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
OUTPUT AND SPENDING														
Real GDP	2.2	2.3	3.1	3.0	3.0	2.7	-2.1	4.6	3.9	2.5	3.0	3.0	3.0	3.0
Consumer Expenditure	2.4	2.3	3.0	2.7	2.5	2.2	1.2	2.5	2.2	3.3	3.1	3.0	3.0	3.0
Residential Fixed Investment	11.9	2.0	9.7	12.3	12.5	10.9	-5.3	8.8	2.7	11.3	10.0	10.0	12.5	12.5
Business Fixed Investment	3.0	5.9	5.6	5.5	5.5	5.2	1.6	9.7	7.1	2.2	6.1	6.1	5.5	5.5
Structures	-0.5	7.7	5.2	5.0	5.0	5.0	2.9	12.6	1.1	6.5	5.0	5.0	5.0	5.0
Equipment	4.6	6.3	6.2	6.1	6.0	5.4	-1.0	11.2	10.8	-0.9	7.5	7.5	6.0	6.0
Intellectual Property Products	3.4	4.1	5.0	5.0	5.0	5.0	4.7	5.5	6.4	4.0	5.0	5.0	5.0	5.0
Federal Government	-5.7	-1.9	-1.4	-1.3	-0.6	0.0	-0.1	-0.9	9.9	-7.0	-4.0	0.0	0.0	-2.0
State and Local Government	0.5	0.9	1.8	2.0	2.0	2.0	-1.2	3.4	0.8	1.3	2.0	2.0	2.0	2.0
Net Exports (\$bn, '09)	-420	-442	-471	-508	-530	-554	-447	-460	-431	-429	-444	-462	-480	-499
Inventory Investment (\$bn, '09)	64	70	73	86	92	89	36	85	79	79	71	71	71	77
Industrial Production, Mfg	2.7	3.4	3.6	3.5	3.5	2.8	1.4	6.8	3.8	3.0	3.5	3.5	3.5	3.5
HOUSING MARKET														
Housing Starts (units, thous)	930	1,010	1,166	1,313	1,460	1,592	925	985	1,033	1,097	1,117	1,151	1,179	1,216
New Home Sales (units, thous)	430	445	521	597	686	769	431	427	436	486	500	514	527	543
Existing Home Sales (units, thous)	5,073	4,906	5,140	5,349	5,484	5,566	4,603	4,867	5,123	5,030	5,064	5,114	5,165	5,217
Case-Shiller Home Prices (%yoy)*	9.9	2.6	3.3	2.3	1.6	1.2	9.0	6.5	3.6	2.6	1.5	2.0	3.5	3.3
INFLATION (% ch, yr/yr)														
Consumer Price Index (CPI)	1.5	1.7	1.3	2.3	2.3	2.4	1.4	2.1	1.8	1.6	1.4	1.0	1.0	1.6
Core CPI	1.8	1.8	1.9	2.1	2.2	2.4	1.6	1.9	1.8	1.9	1.9	1.8	1.8	1.9
Core PCE**	1.3	1.4	1.5	1.7	1.9	2.0	1.2	1.5	1.5	1.5	1.5	1.5	1.5	1.5
LABOR MARKET														
Unemployment Rate (%)	7.4	6.2	5.6	5.2	4.8	4.6	6.7	6.2	6.1	5.8	5.7	5.6	5.5	5.4
GOVERNMENT FINANCE														
Federal Budget (FY, \$ bn)	-680	-483	-525	-575	-550	-550	--	--	--	--	--	--	--	--
FINANCIAL INDICATORS														
FF Target Range (Bottom-Top, %)^	0-0.25	0-0.25	0.5-0.75	1.5-1.75	2.75-3	3.75-4	0-0.25	0-0.25	0-0.25	0-0.25	0-0.25	0.25-0.5	0.5-0.75	
10-Year Note^	2.72	2.50	3.00	3.50	3.75	4.25	2.71	2.56	2.42	2.50	2.60	2.75	2.85	3.00
Euro (\$/€)^	1.35	1.23	1.15	1.05	1.00	1.00	1.37	1.37	1.33	1.23	1.20	1.18	1.16	1.15
Yen (¥/\$)^	100	120	130	135	140	140	102	102	103	120	125	125	128	130
Brent Crude Oil (\$/bbl)^	111	85	85	90	90	90	107	112	97	85	83	80	85	85

* Weighted avg of metro-level HPis for 366 metro cities where the weights are dollar values of single-family housing stock reported in the 2000 Census.

** PCE = Personal consumption expenditures. ^ Denotes end of period

NOTE: Published figures are in bold.

Source: Goldman Sachs Global Investment Research.

Economic Releases and Other Events

Date	Time (EDT)	Indicator	Estimate			
			GS	Consensus	Last Report	
Mon	Dec 01	10:00	ISM Manufacturing Index (Nov)	58.0	58.2	59.0
Tue	Dec 02	10:00	Construction Spending (Oct)	+0.8%	+0.5%	-0.4%
		17:00	Lightweight Motor Vehicle Sales (Nov)	16.9M	16.5M	16.4M
		17:00	Domestic Motor Vehicle Sales (Nov)	13.6M	13.1M	13.1M
Wed	Dec 03	8:15	ADP Employment Change (Nov)	190,000	223,000	230,000
		8:30	Nonfarm Productivity (Q3 Final)	+2.5%	+1.8%	+2.0%
			Unit Labor Costs	-1.4%	+0.5%	+0.3%
		10:00	ISM Nonmanufacturing Index (Nov)	58.0	57.7	57.1
	14:00	Fed's Beige Book				
Thu	Dec 04	8:30	Initial Jobless Claims	n.a.	n.a.	313,000
		8:30	Continuing Claims	n.a.	n.a.	2,316,000
Fri	Dec 05	8:30	Unemployment Rate (Nov)	5.8%	5.7%	5.8%
		8:30	Nonfarm Payrolls (Nov)	220,000	225,000	214,000
		8:30	Private Payrolls (Nov)	215,000	219,000	209,000
		8:30	Average Hourly Earnings (Nov)	+0.2%	+0.2%	+0.1%
		8:30	Trade Balance (Oct)	-\$42.0bn	-\$41.0bn	-\$43.0bn
		10:00	Factory Orders (Oct)	+0.3%	-0.2%	-0.6%
	15:00	Consumer Credit (Oct)	n.a.	+\$16.4bn	+\$15.9bn	

Source: Goldman Sachs Global Investment Research.

