

Reassessing long-term commodity prices

September 2006

Jeffrey Currie Goldman Sachs International 44-(0)20-7774-6112 jeffrey.currie@gs.com

The Goldman Sachs Group, Inc. does and seeks to do business with companies covered in its research reports. As a result, investors should be aware that the firm may have a conflict of interest that could affect the objectivity of this report. Investors should consider this report as only a single factor in making their investment decision.

For important disclosures, see page 45, go to <http://www.gs.com/research/hedge.html>, or contact your investment representative.

Question 1

Q: What is the current investor premium embedded in the oil price ??

- a) \$1/bbl - \$9/bbl
- b) \$10/bbl - \$29/bbl
- c) \$20/bbl - \$29/bbl
- d) \$30/bbl plus

Question 2

Q: What is the current return on capital for the bottom quartile oil companies?

- a) 0% - 9%
- b) 10% - 19%
- c) 20% - 29%
- d) 30% +

Oil companies are not earning much higher returns today than in 2000, when WTI crude oil prices averaged \$30/bbl

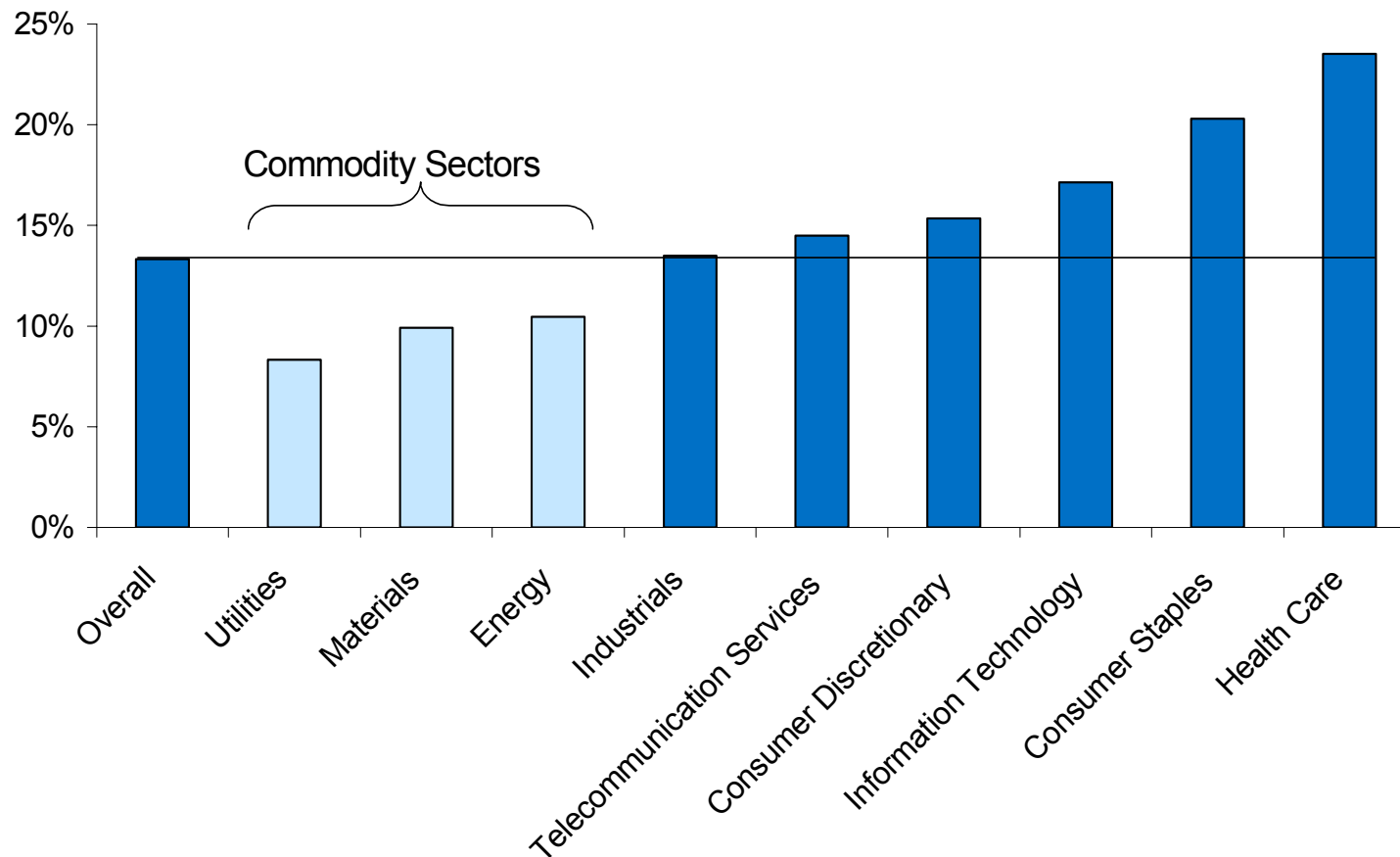
	2000	2006E	00-06E
Sector average ROCE	17.0%	19.0%	2.0%
Top quartile ROCE	24.0%	28.0%	4.0%
Bottom quartile ROCE	10.0%	10.0%	0.0%

Source: Goldman Sachs Research estimates.

The revenge of the old economy

Poor returns in commodity sectors led investment to flow elsewhere

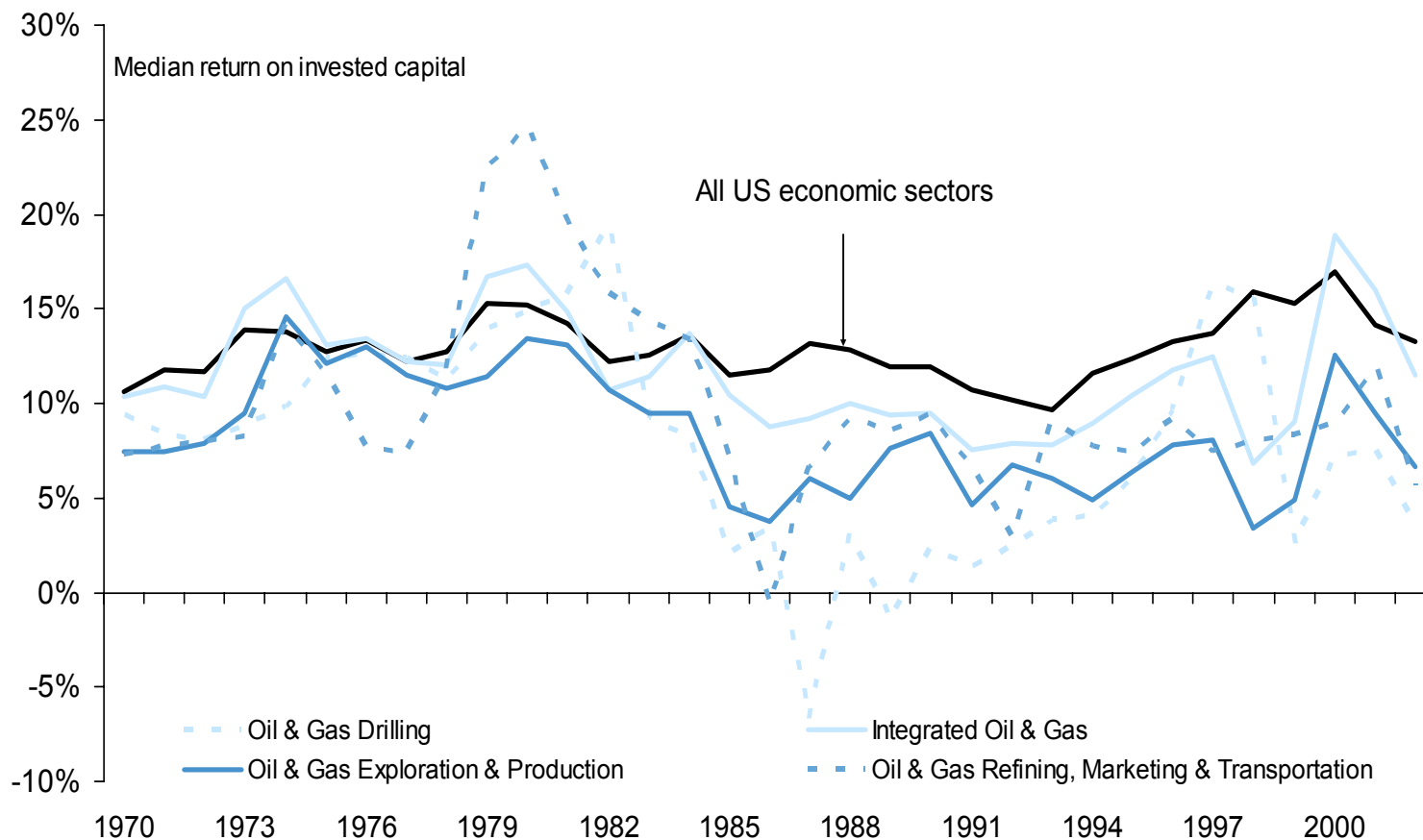
Cash Return on Cash Invested
S&P 500 excluding Financial sector, 1991- 2000 Average Return



Source: Compustat and Goldman Sachs Commodity Research.

Return on capital employed in energy sectors has remained below that in the rest of the economy, leading to underinvestment in energy market infrastructure

percent return



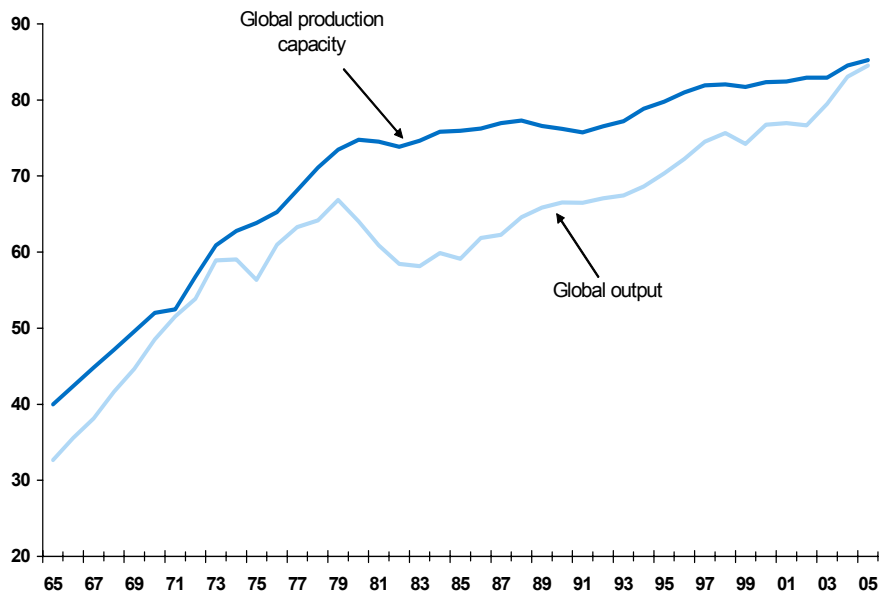
Source: Compustat and Goldman Sachs Commodity Research.

The transition between an exploitation phase and an investment phase: The revenge of the old economy, Part II

The industry has exhausted spare capacity, ending an exploitation phase and beginning a new investment phase

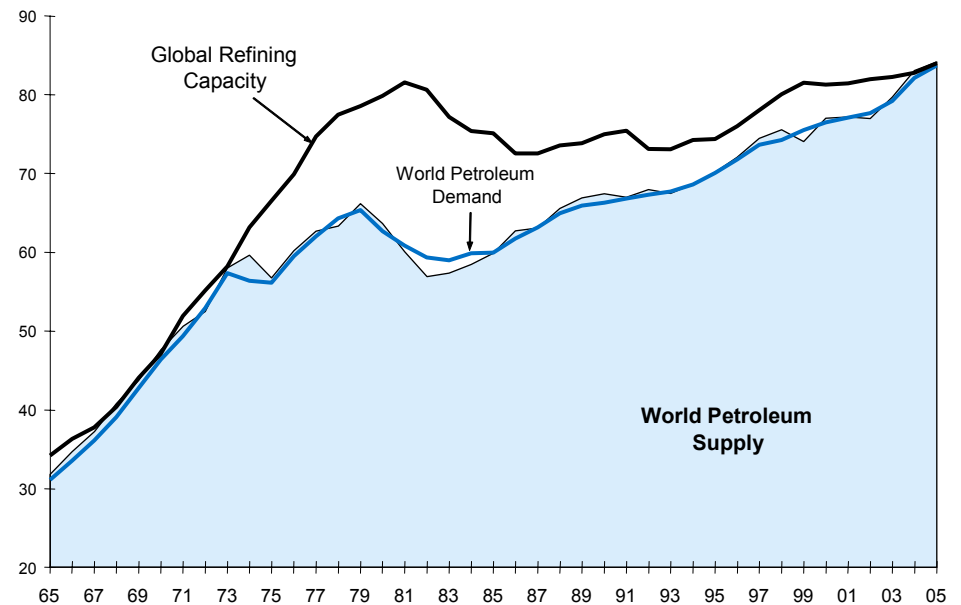
Global oil production and capacity

million b/d



Global refining capacity

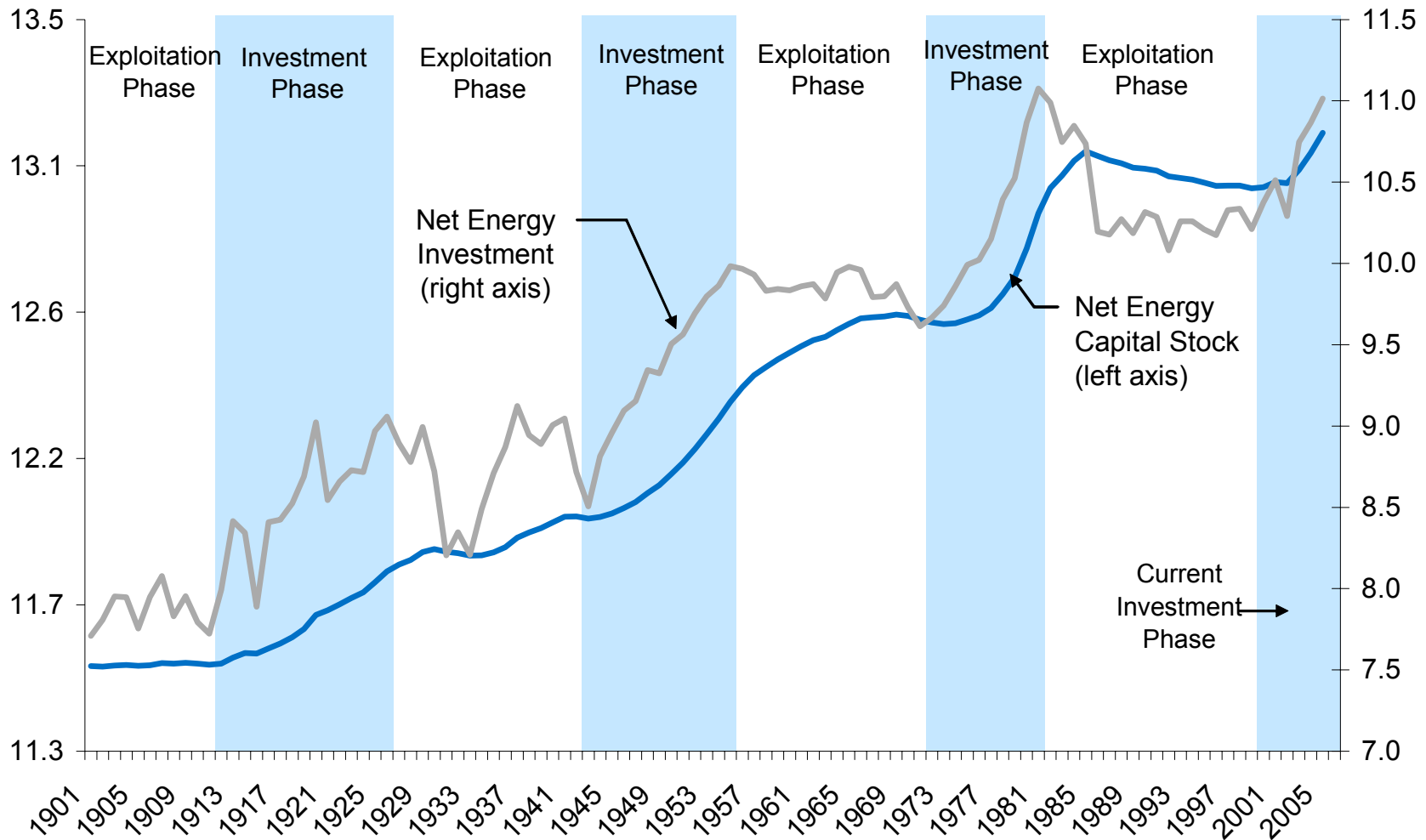
million b/d



Source: International Energy Agency (IEA), DOE, Goldman Sachs Commodity Research.

Increased investment has begun to increase the energy capital stock

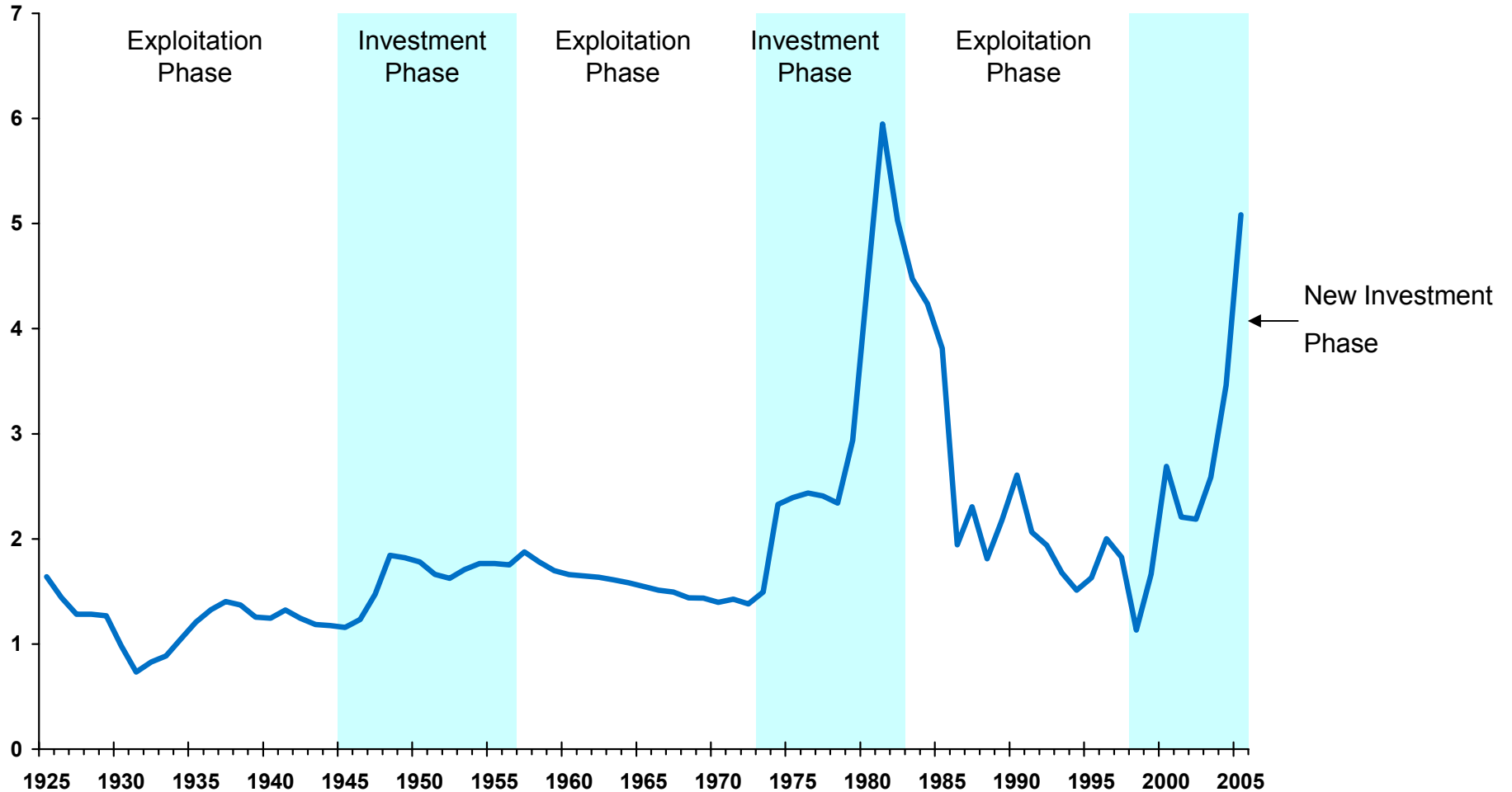
Investment and energy capital stock in the United States in real 1000 log \$



Source: Bureau of Economic Analysis (BEA), Goldman Sachs Commodity Research.

Investment phases are typically characterised by rising prices, while prices decline during exploitation phases

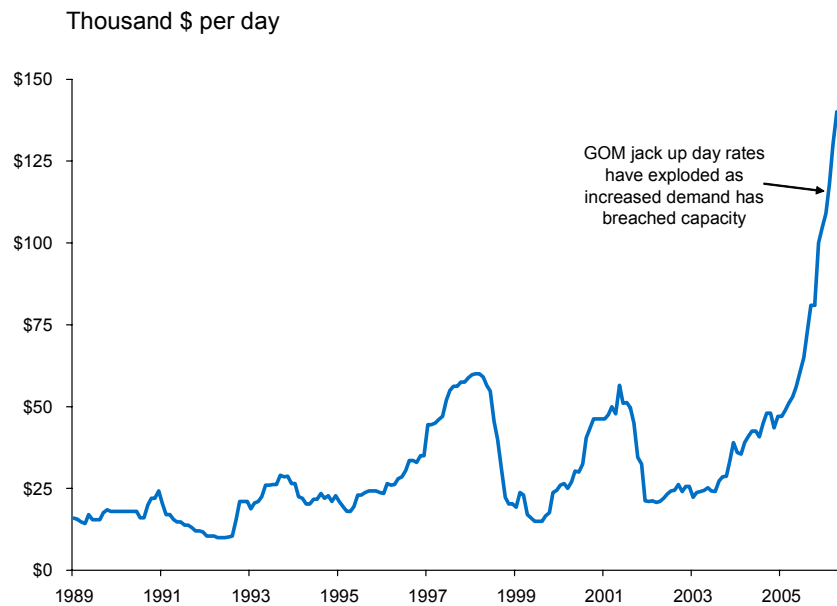
Real price index 1925 = base year



Source: Goldman Sachs Commodity Research.

Production input bottlenecks are creating cost escalation

The demand for drilling has created bottlenecks for rigs



Source: Baker Hughes.

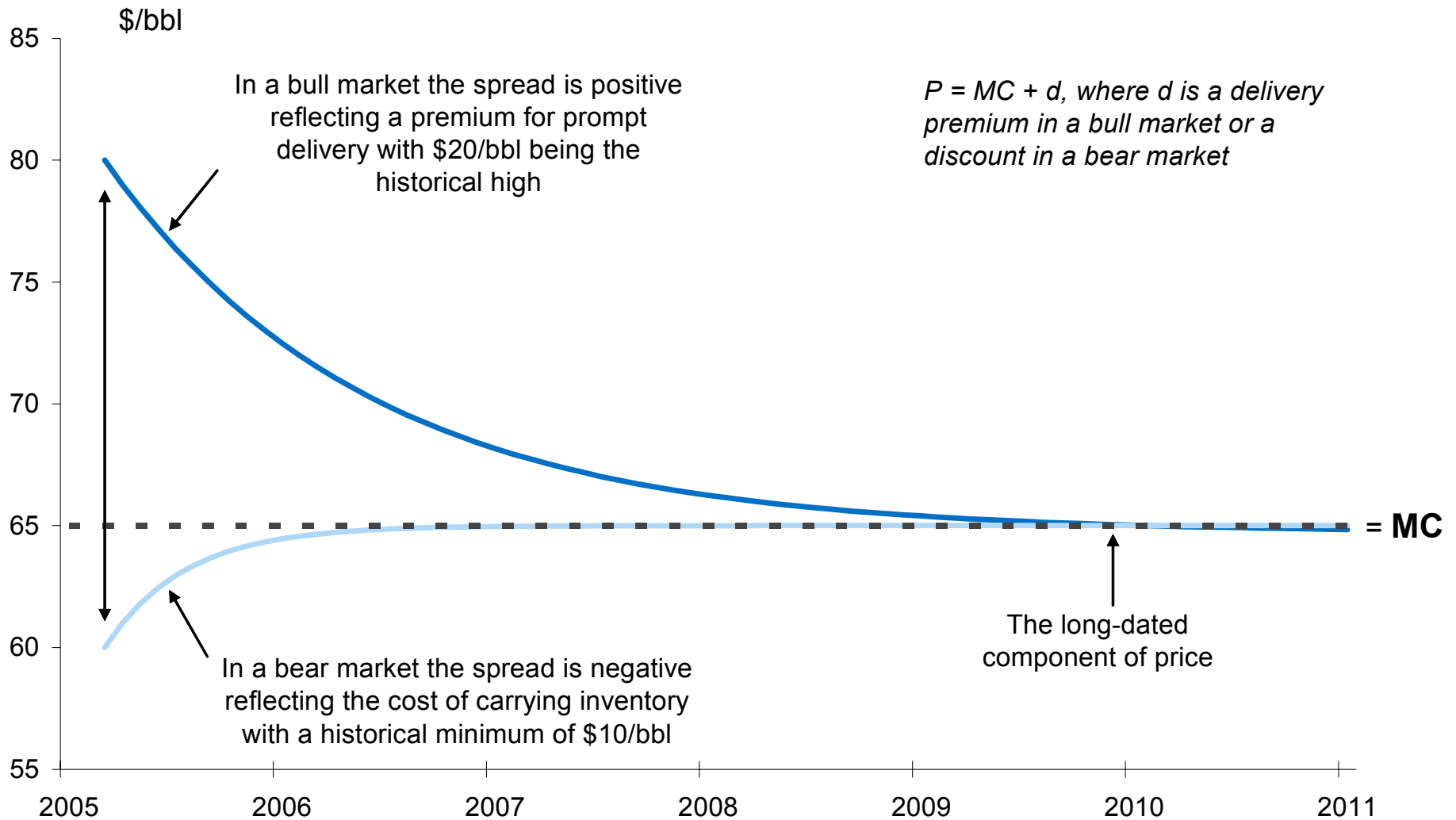
Labour has just started to respond to increased investment



Source: BEA.

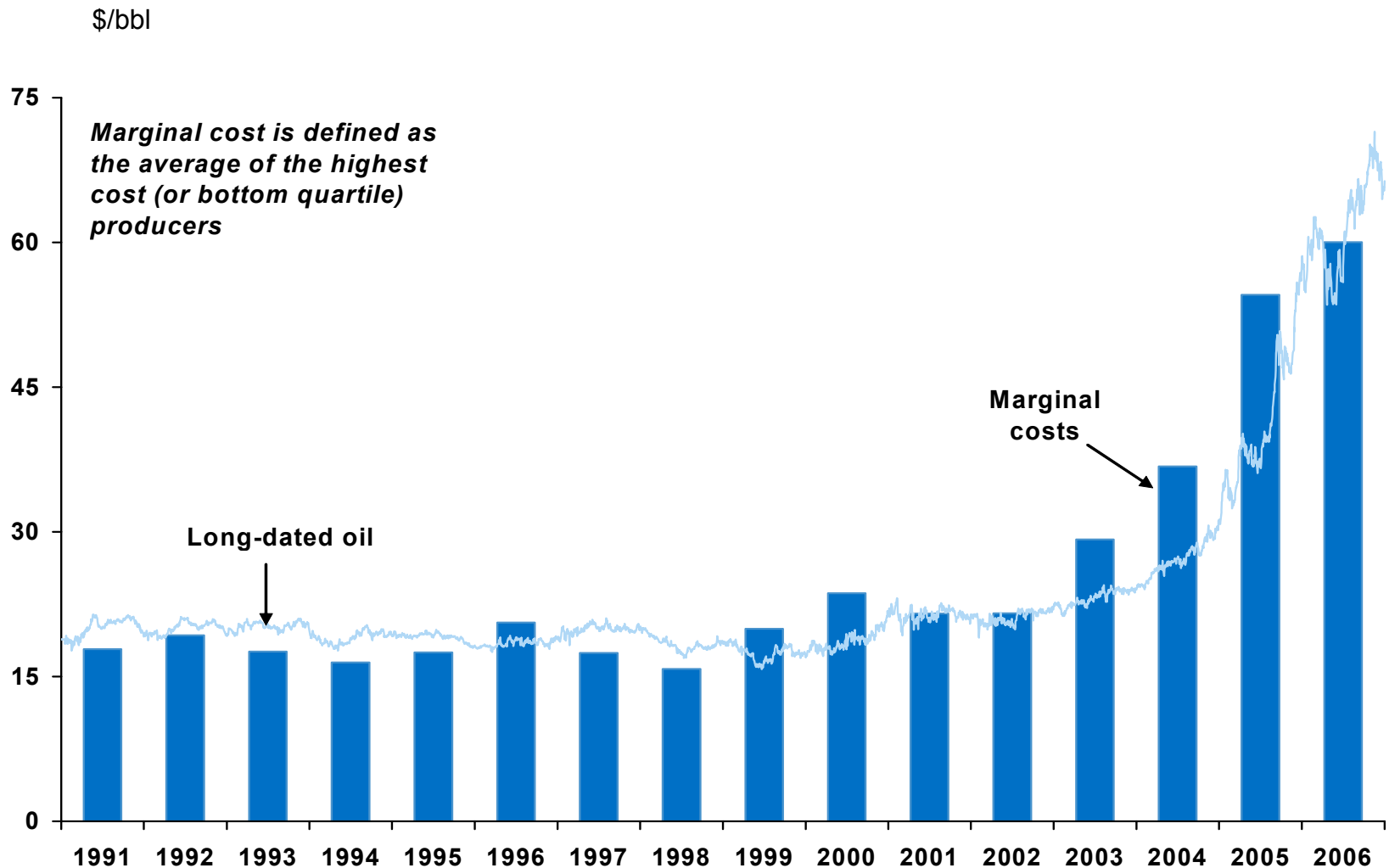
**Cost structure drives long-term price while
fundamentals drive curve shape**

The key is to decompose the long-term oil price into (1) the long-dated oil price, and (2) the spread between the spot and long-dated oil price



Source: Goldman Sachs Commodity Research.

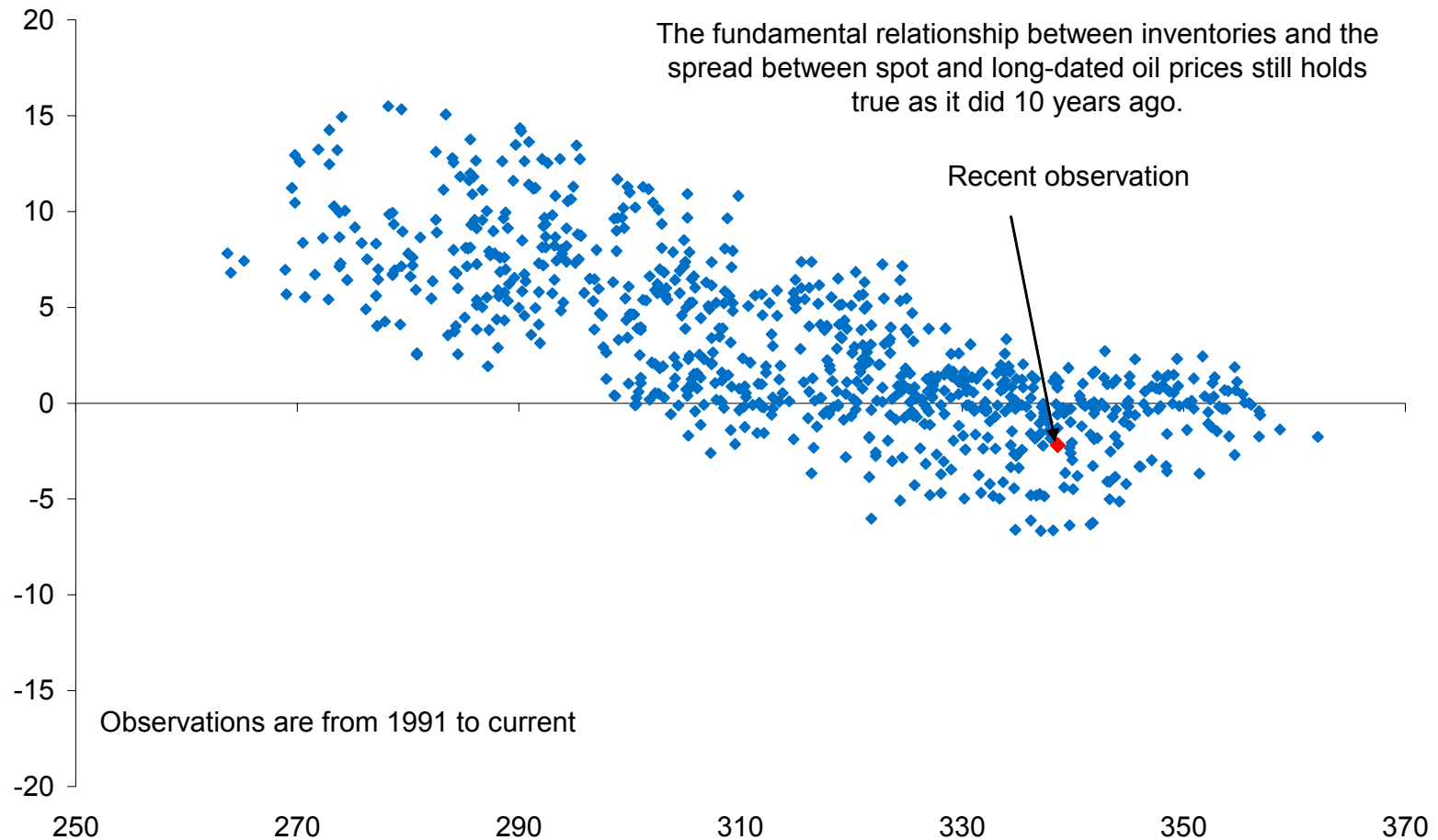
Rising cost and investment uncertainty have continued to push long dated prices higher



Source: Goldman Sachs Research

The fundamentals are priced into the spread between spot and long-dated prices

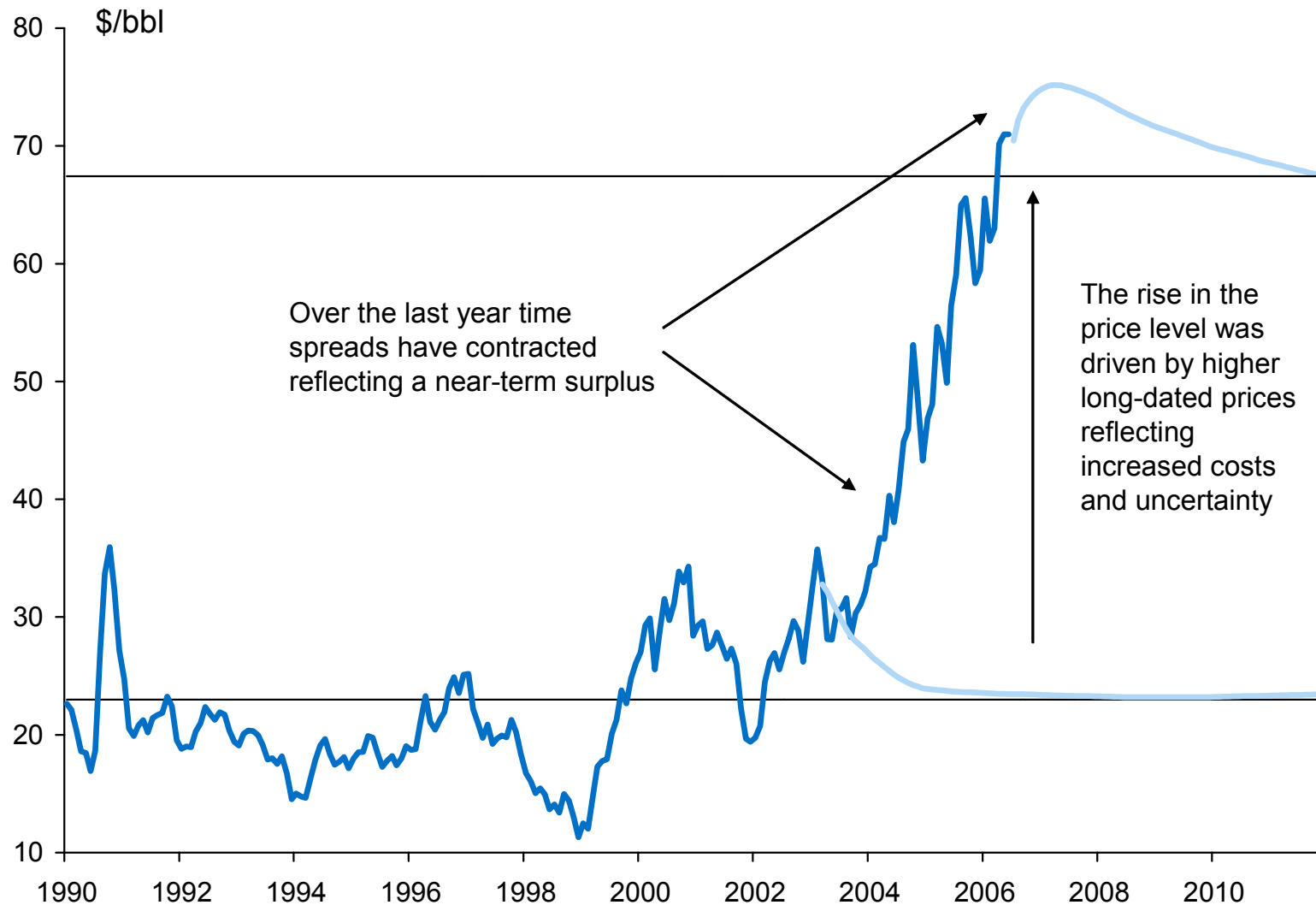
Spot – 5-yr forward price in \$/bbl (vertical axis); US crude stocks in millions of barrels (horizontal axis)



Source: Department of Energy and Goldman Sachs Commodity Research.

**A cyclical bear market at US\$70/bbl
Long-term shortages create near-term surpluses**

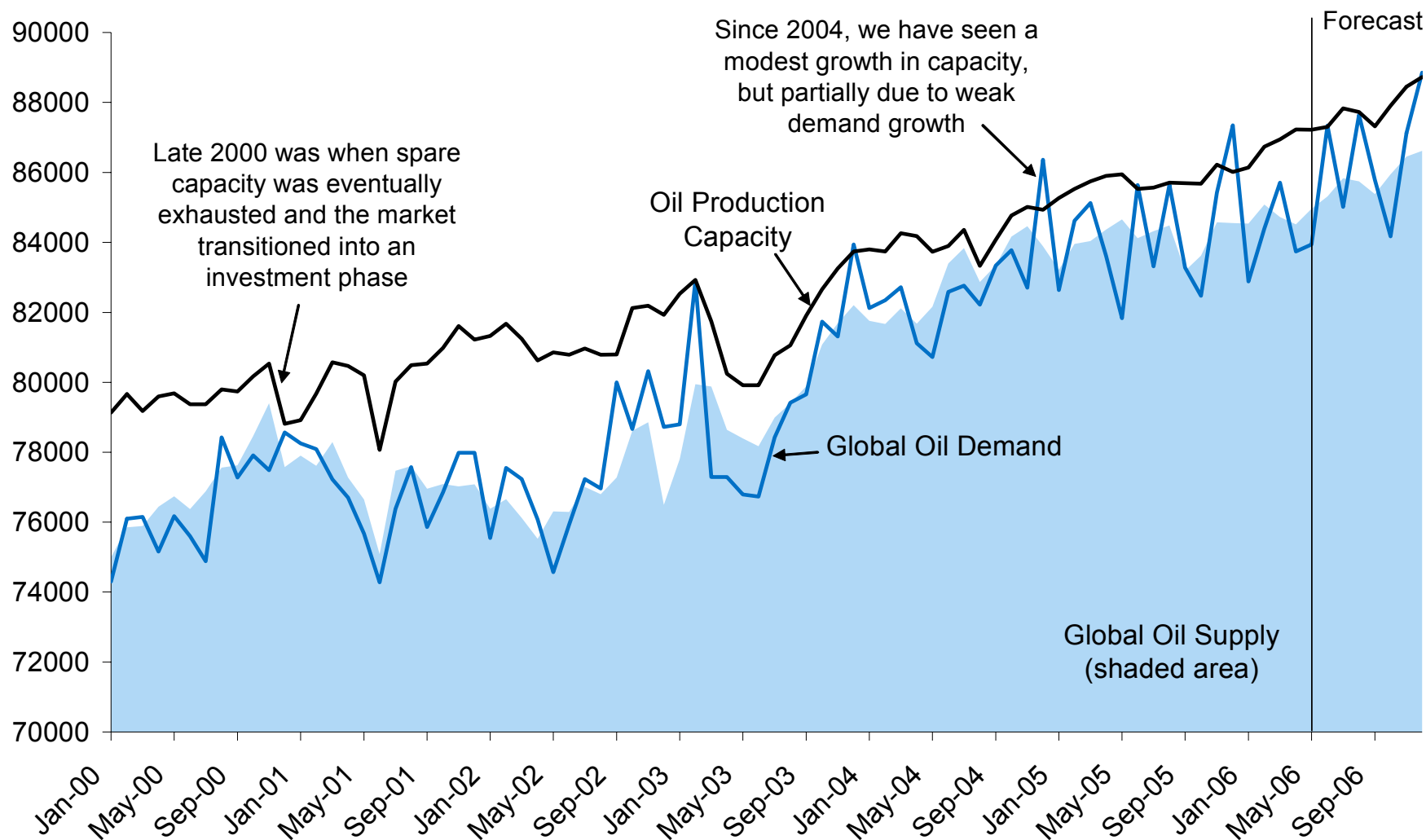
Rising long-dated prices have dragged spot prices higher despite near-term surpluses



Source: Goldman Sachs Commodity Research.

Market still needs long-term capacity

Growth of global production capacity has now created a 'thin layer' of spare capacity

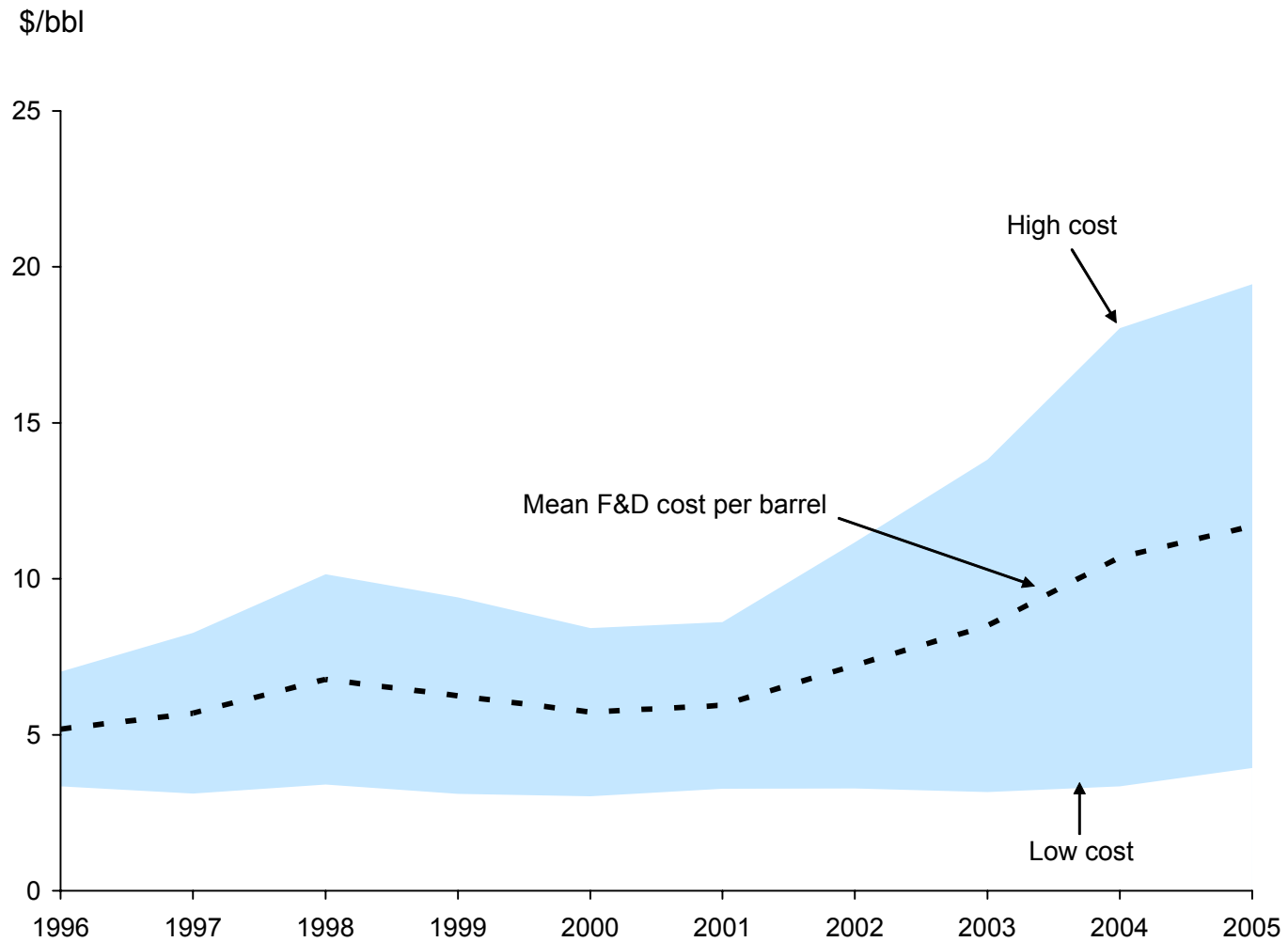


Source: IEA, US DOE WBMS, Goldman Sachs Commodities Research.

Projects are Experiencing Large Cost Overruns

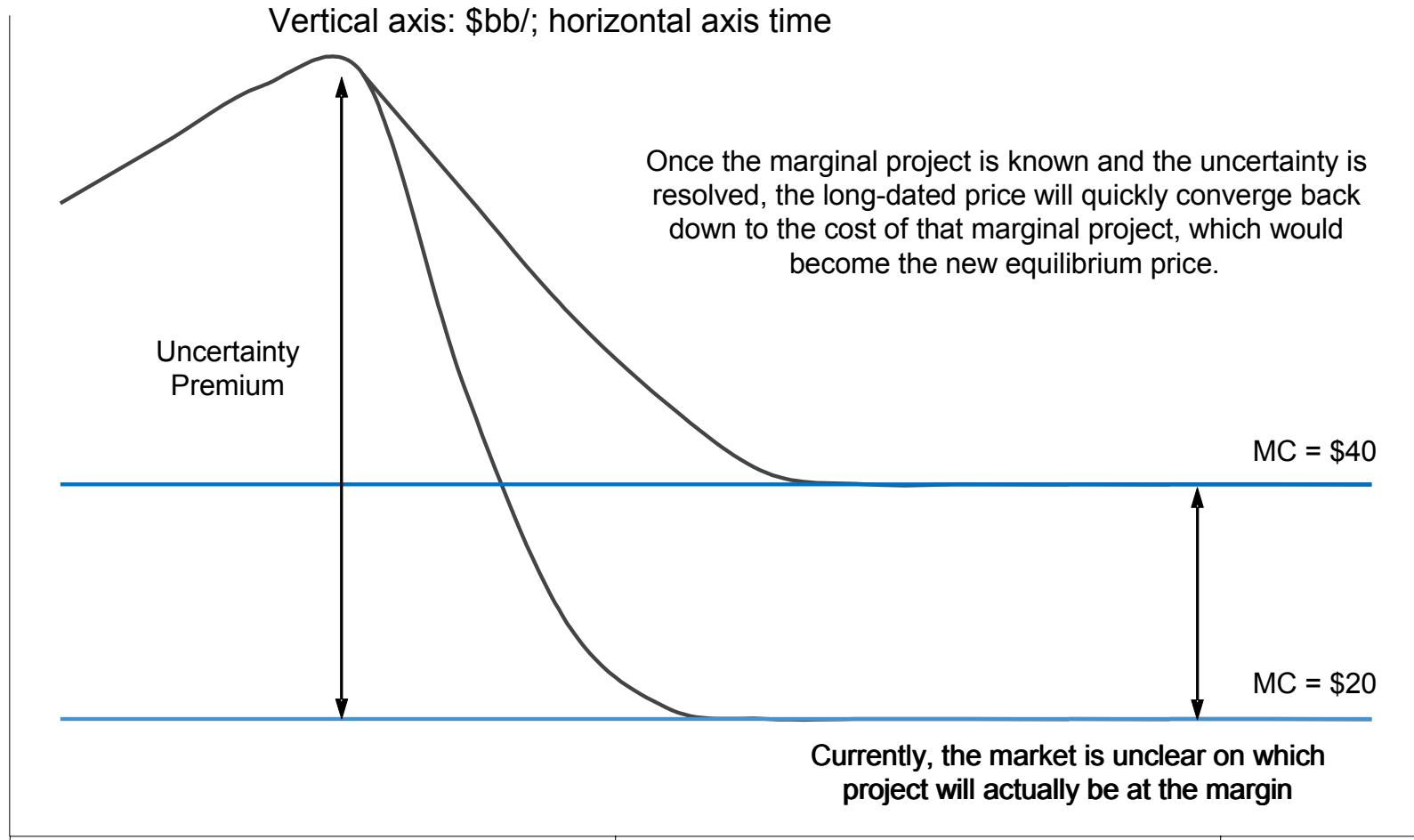
Company Name	News
Nexen Oil Sands and OPTI Canada	The estimated costs for their Long Lake oil sands project in Alberta have been revised up from C\$3.8 billion (\$3.4 billion) to C\$4.2 billion because of high labor costs and lower than expected productivity. (reported July 13, 2006)
Connacher Oil and Gas	Cost estimates for its Great Divide oil sands project in Alberta have been raised 15% mainly due to the continued rise in steel and drilling costs. On track to start producing 10,000 b/d in 2Q 2007. (reported July 13, 2006)
Shell Canada Ltd., Western Oil Sands, and Chevron Canada Ltd.	The C\$7.3 billion (\$6.6 billion) Athabasca oil sands expansion in northern Alberta is now facing capital costs 50 percent higher than those anticipated last year. Project costs could top C\$11 billion. (reported July 5, 2006)
Canadian Oil Sands Trust and SynCrude Canada Ltd.	The expansion of their project north of Fort McMurray, Alberta to boost capacity by 100 kb/d is now expected to cost \$6 billion by mid-2006, almost double a 2001 forecast of \$3.14 billion. (reported February 18, 2006)
Eni, ExxonMobil, Shell, and ConocoPhillips	The costs of developing the large Kashagan oilfield in the Caspian Sea have risen 50% to \$15 billion. (reported May 14, 2006)
BP	The flagship pipeline (Baku-Tbilisi-Ceyhan (BTC)) through Azerbaijan, Georgia, and Turkey linking Caspian Sea oilfields experienced cost overruns of \$1 billion (32% over budget) due to soaring bills from contractors and material suppliers. (Construction costs increased from \$2.95 billion to \$3.9 billion). Came online May 25th. (reported April 20, 2006)
Statoil	Costs for its 7 trillion cubic foot Snohvit LNG project in the Barents Sea (Norway) have risen 50% to \$9.3 billion. (reported July 11, 2006)
Royal Dutch Shell	Executives have delayed expansion of their 140 kb/d Pearl gas-to-liquids (GTL) plant in Qatar due to cost estimate increases from \$5 to \$6.3 billion. An investment decision is expected later this year. (reported April 24, 2006)
ExxonMobil	The proposed 154 kb/d GTL complex in Qatar has seen its budget increase more than 10% to \$7.8 billion. (reported April 24, 2006)
Tesoro	Canceled its coker project at its Anacortes, Washington refinery because of higher than expected costs. (reported July 10, 2006)
Valero	Delayed expansion of its 250 kb/d Texas refinery by about 3 months because of labor cost inflation of about 20-25% this year. (reported April 25, 2006)

This overshoot reflects increased uncertainty in the industry's cost structure



Source: Goldman Sachs Commodity Research.

Once uncertainty is resolved, the premium will disappear as long-term oil prices find a new equilibrium



Source: Goldman Sachs Commodity Research.

Costs and inventories will likely keep metals prices high and volatile

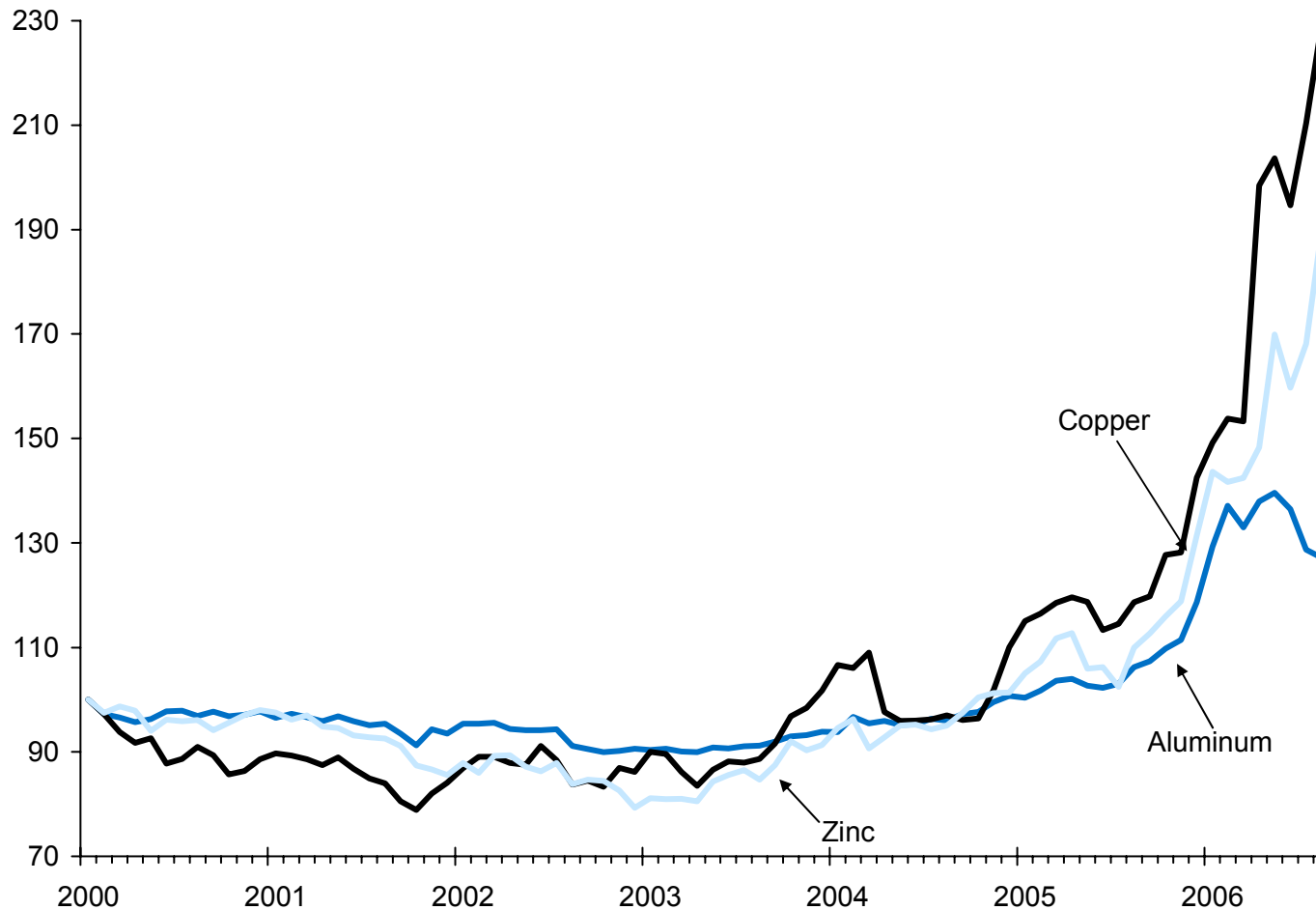
Mining companies continue to experience higher cost pressures

Company Name	News
Compania de Minas Buenaventura	Cash costs for gold have increased 21% from a year ago in July due to higher energy, input material and development costs, declining ore grades, and higher royalties.
Freeport-McMoRan Copper and Gold	Cash costs of \$2161/mt for copper were higher than the guidance of \$1257/mt in 2Q06, due to higher TC/RC, royalty, and energy costs. 2006 guidance was also raised from \$1190/mt to \$1455/mt.
Inco	Inco reported cash costs of \$4586/mt for nickel higher than the guidance of \$4190/mt - \$4300/mt in 2Q06, due to higher fuel and material costs.
Industrias Penoles	Penoles reported an 9.6% YoY increase in diesel, energy, labor and maintenance costs in April for zinc.
CVRD	CVRD's costs of goods sold increased 51% in the last 12 months. The main contributors to the cost increase include: stronger local currency (15%), higher procurement costs (28% - consumables, equipment, labor and energy) and expansion related increase (7%).
Antofagasta	Antofagasta experienced higher cash costs for copper at Pelambres of \$661/mt vs GS's \$265/mt estimate, at Michilla of \$2822/mt vs GS's \$1720/mt estimate, and at Tesoro of \$1753/mt in 1Q06 due to higher costs from shipping, loading, fuel, input costs, and stronger Chilean peso.
Phelps Dodge	Phelps Dodge is experiencing higher costs due to higher mining and milling rates, higher TC/RC, higher freight costs, higher oil and gas prices, and higher tax.
Teck Cominco	Teck Cominco is facing cost pressures due to higher energy costs.
Alcoa	Alcoa is facing higher power and raw material costs.

Source: Goldman Sachs Research.

We believe higher costs will support the higher long-term metals prices

Five-year forward prices
Index, January 2000 = 100t

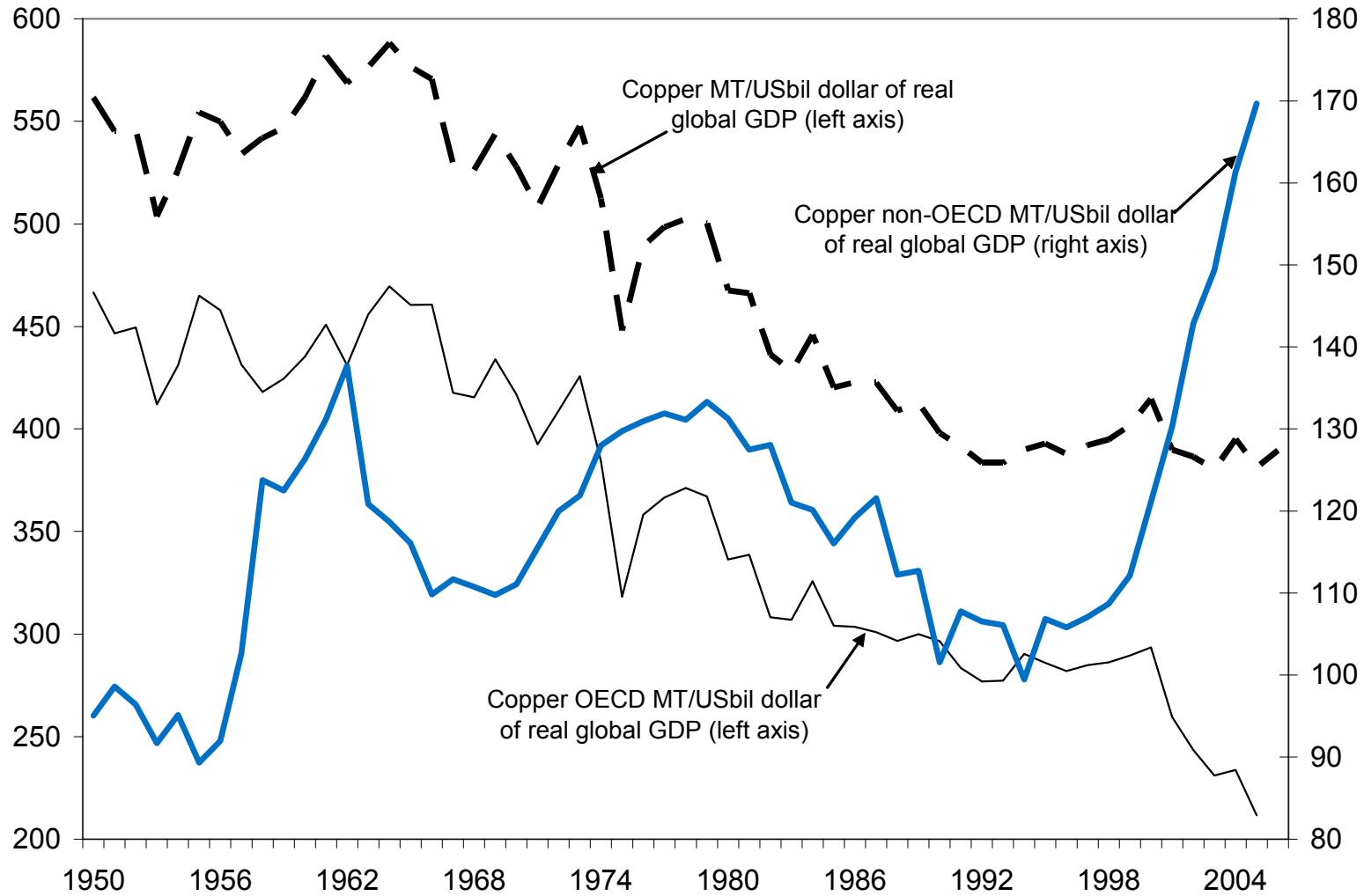


Source: Goldman Sachs Commodity Research.

Unlike energy, metals are in a cyclical bull market

Metals consumption has been driven by a massive infrastructure boom in the Non-OECD

Copper consumption in MT/US bil dollar in real global GDP

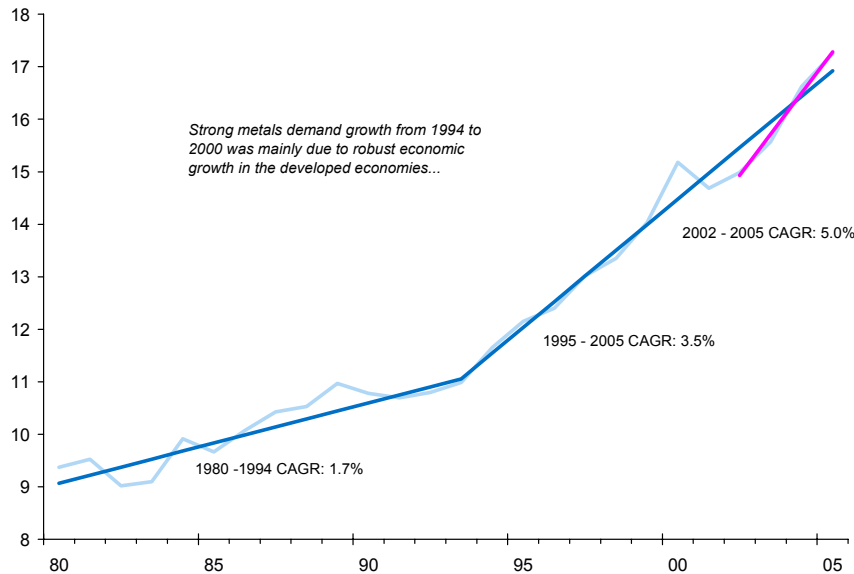


Source: WBMS and Goldman Sachs Commodity Research

This has created an acceleration in global metals demand since the mid-1990s

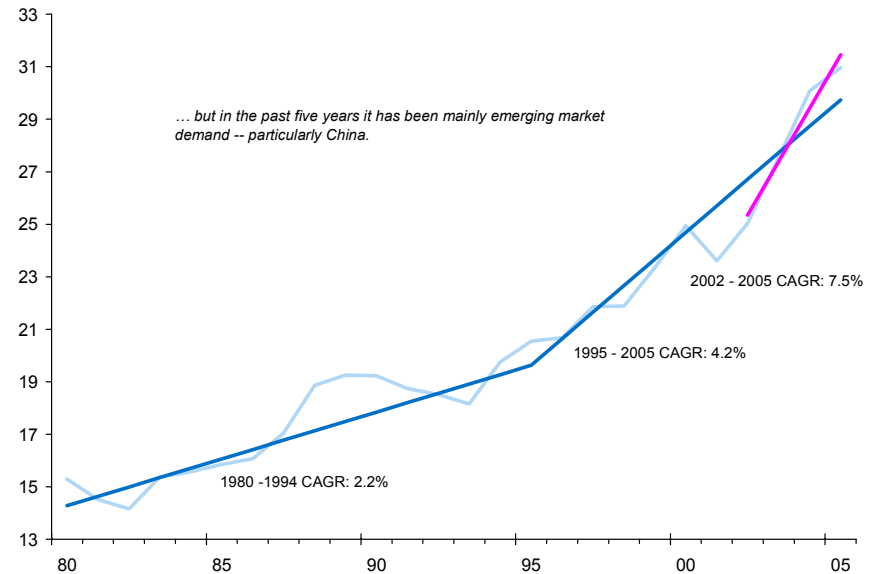
Global copper consumption

Thousand metric tons



Global aluminum consumption

Thousand metric tons

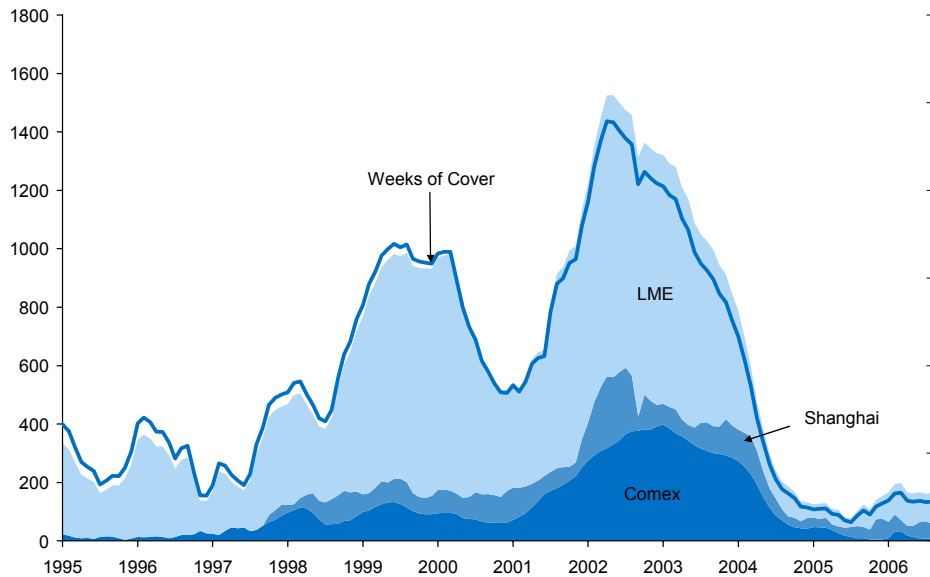


Source: CRU, WBMS, Goldman Sachs Commodities Research.

Inventory levels are still relatively low, reflecting continued cyclically strong markets

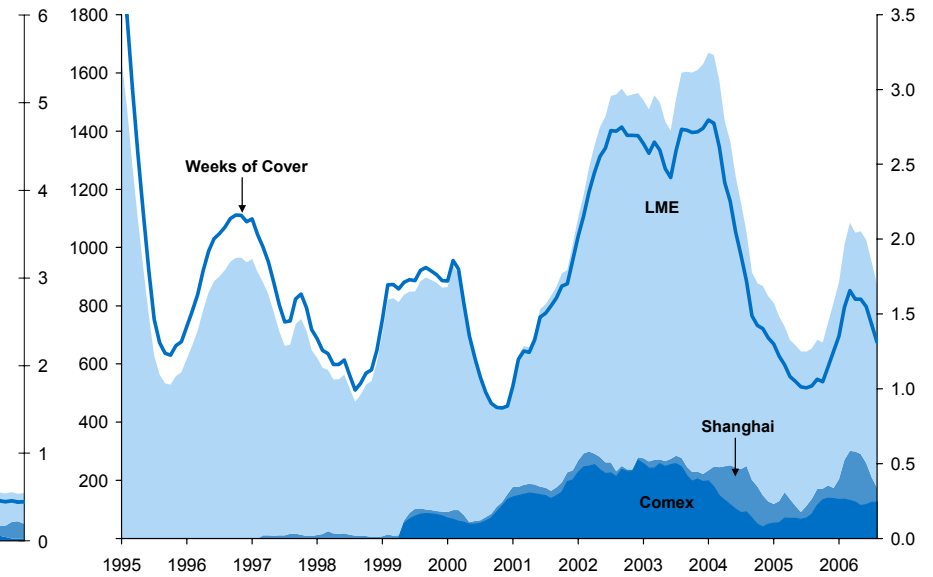
Copper

Thousand metric tons



Aluminum

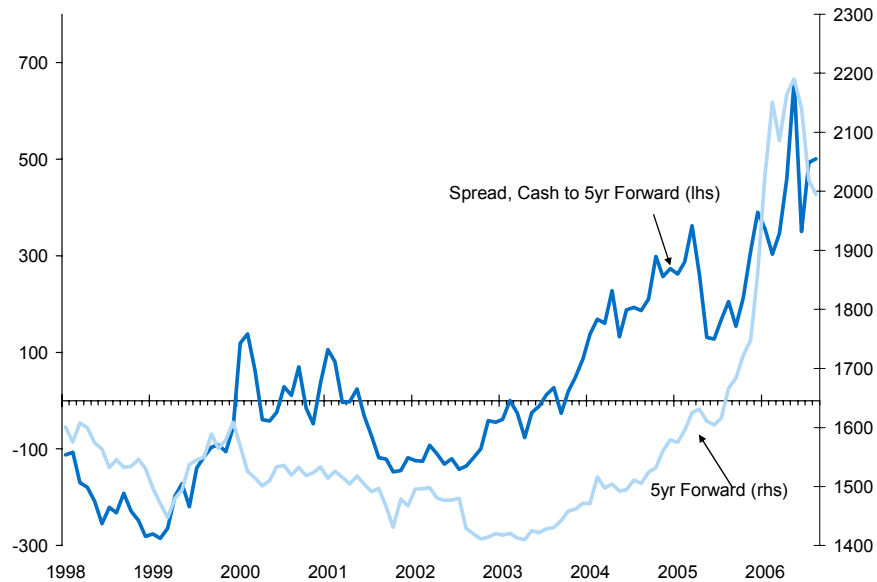
Thousand metric tons



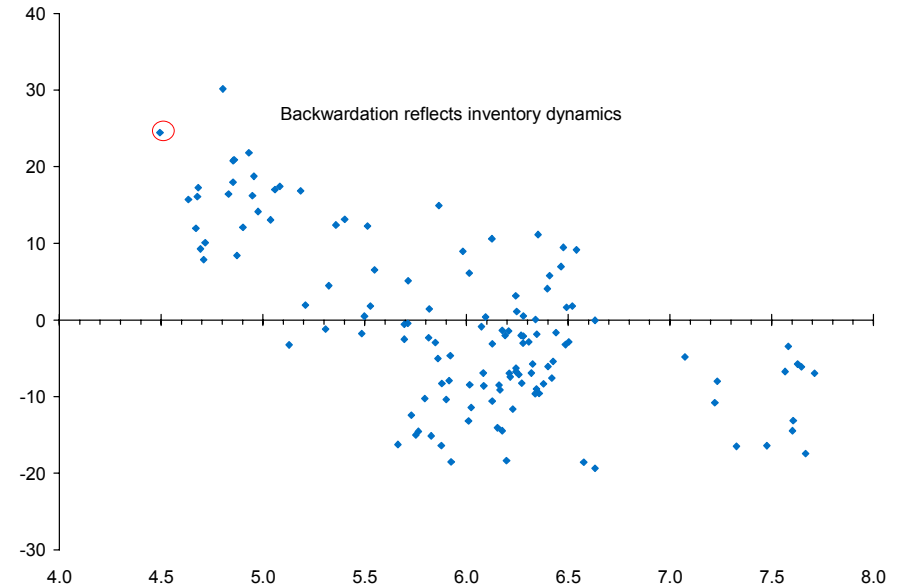
Source: Comex, LME, SHFE and Goldman Sachs Commodity Research.

As a result, the spread between spot and long-dated prices remains high (1)

Aluminum long-dated price and cash spread
US\$/mt



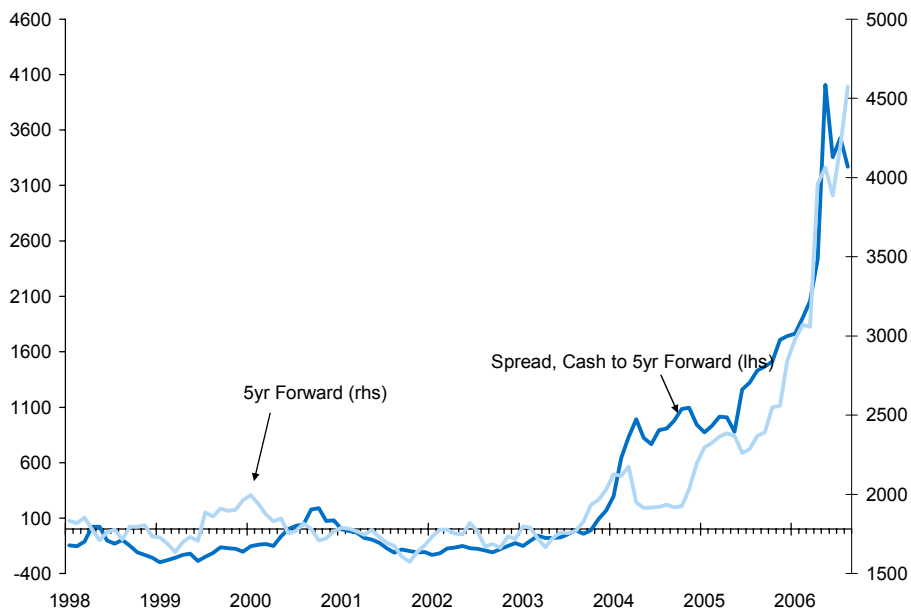
Aluminum cash to five-year price spread vs. visible inventories
Vertical axis: Percentage; horizontal axis: weeks of consumption



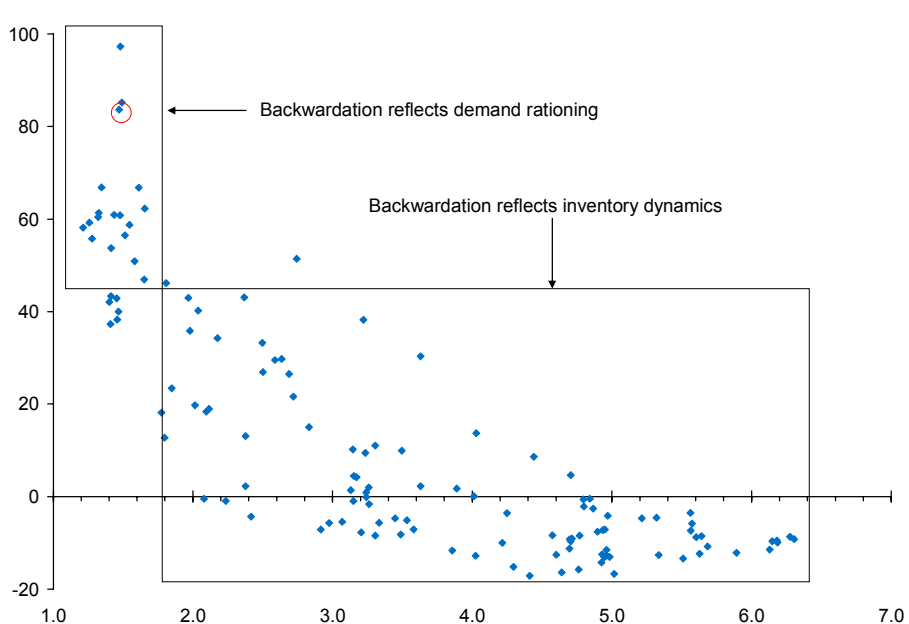
Source: Goldman Sachs Commodities Research.

As a result, the spread between spot and long-dated prices remains high (2)

Copper long-dated price and cash spread
US\$/mt



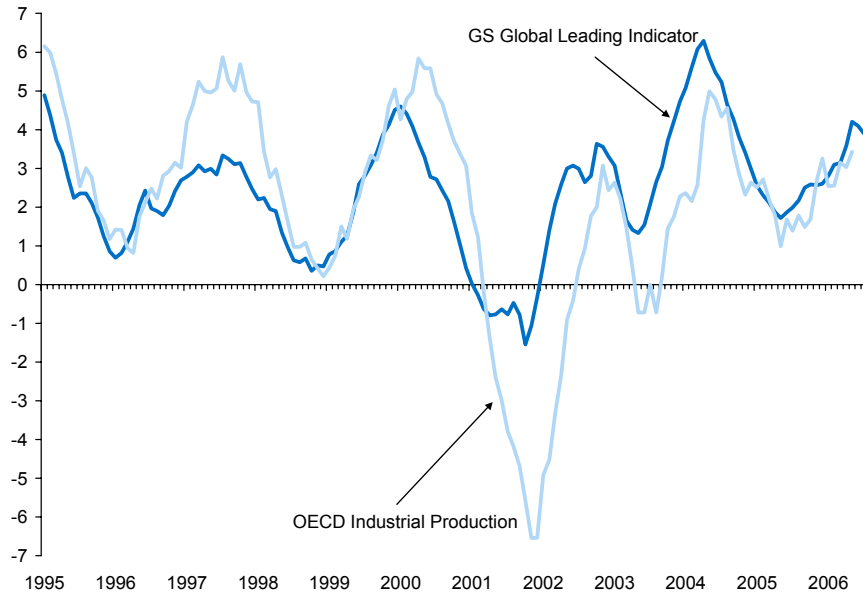
Copper cash to five-year price spread vs. visible inventories
Vertical axis: Percentage; horizontal axis: weeks of consumption



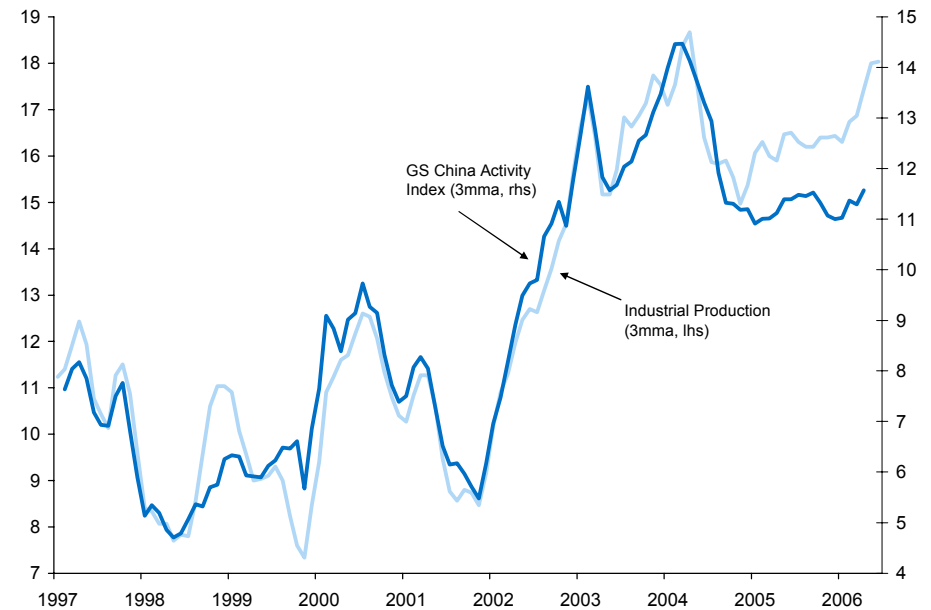
Source: Goldman Sachs Commodities Research.

Our baseline forecast is for solid economic growth to support a cyclically robust market

Global industrial activity has begun to accelerate
Percent change over a year ago



Chinese growth is maintaining a high pace
Percent change over a year ago



Source: Goldman Sachs Commodities Research.

Global growth is expected to remain firm next year, with 2007 slower but still above trend

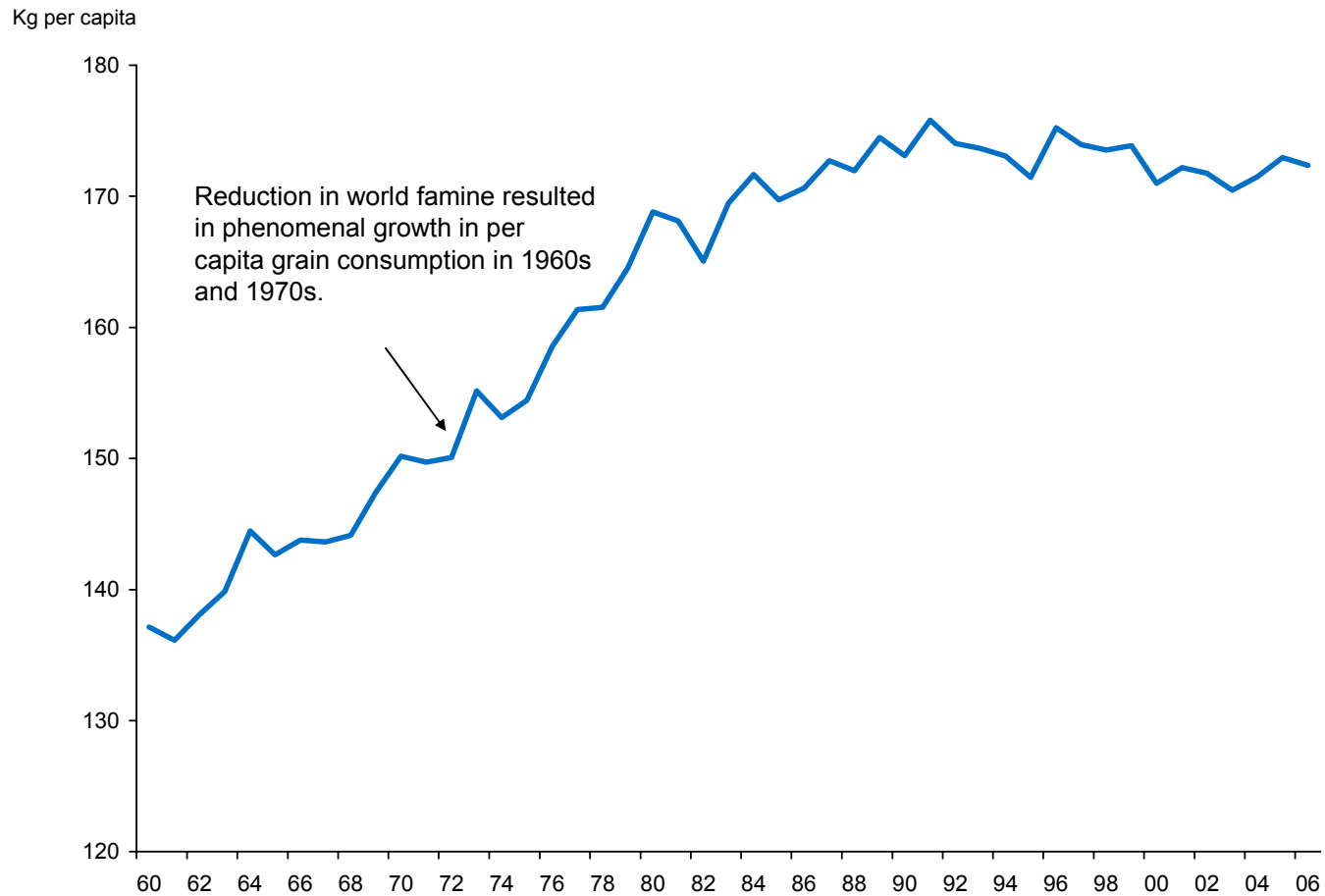
REAL GDP GROWTH

(% yoy)	2004	2005	2006 (E)	2007 (E)
China	10.1	10.2	10.5	9.1
US	3.9	3.2	3.5	2.4
Euroland	1.7	1.5	2.6	2.0
Japan	2.3	2.6	2.9	2.9
South Korea	4.7	4.0	4.8	4.0
Russia	7.2	6.4	6.7	6.3
Taiwan	6.1	4.1	4.2	4.5
India	8.1	8.3	7.3	7.0
Canada	2.9	2.9	3.4	2.9
Brazil	5.0	2.2	3.8	4.3
World	4.7	4.2	4.6	3.9

Source: Goldman Sachs Economic Research estimates

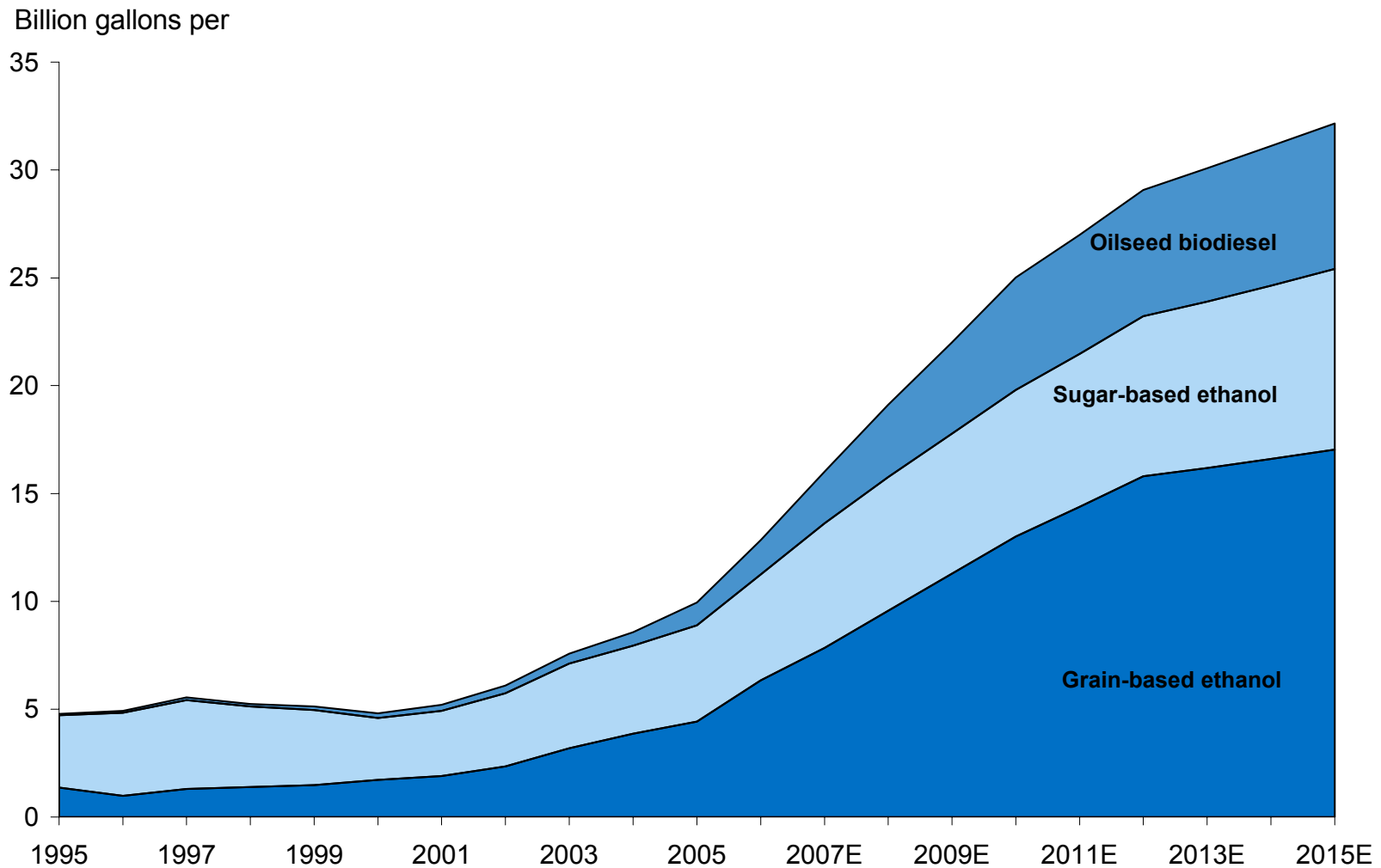
Near-term upside in wheat and long-term upside in corn and soybean

Per capita grains consumption by human beings has been flat



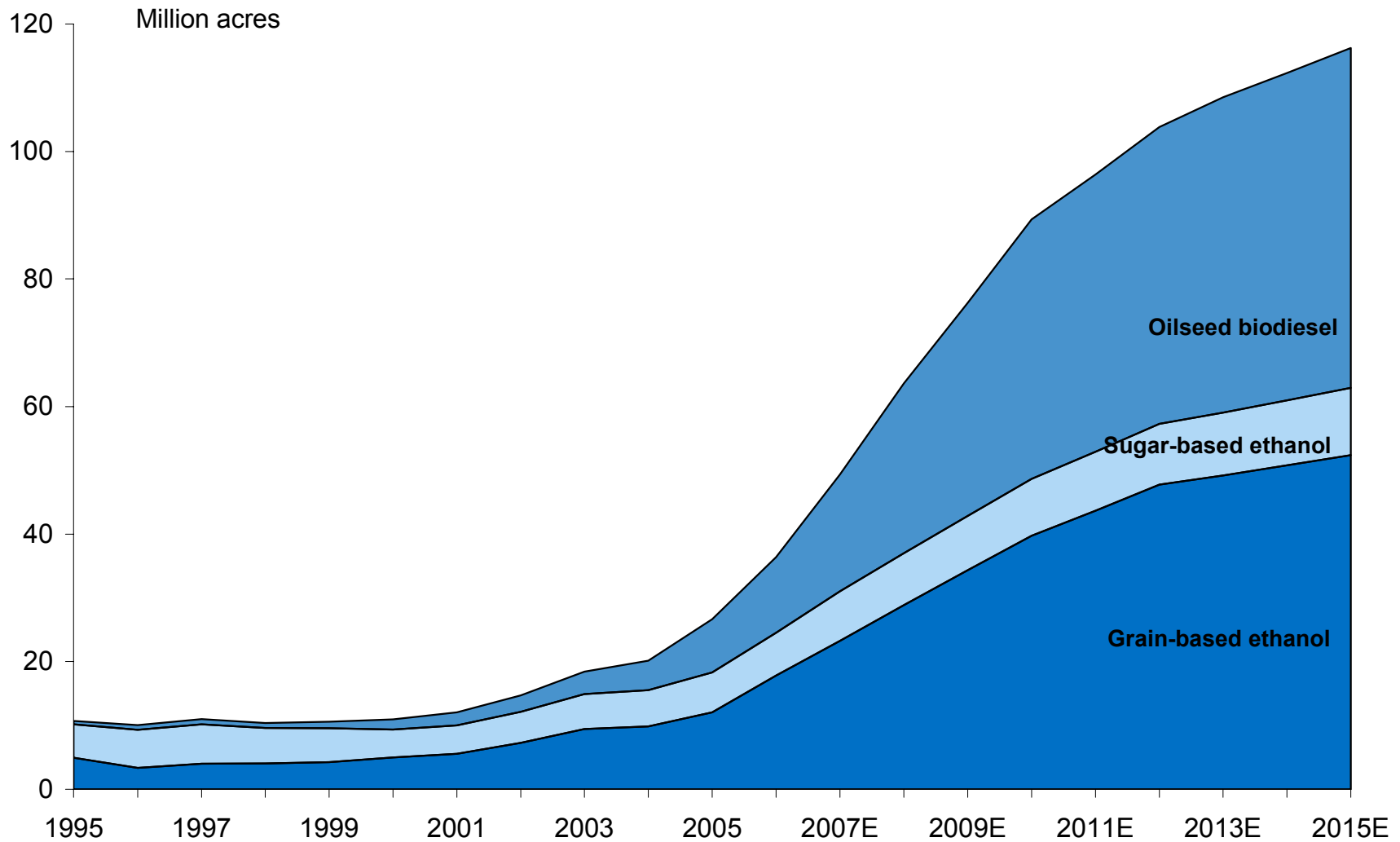
Source: USDA, Goldman Sachs Commodity Research.

Biofuel demands will likely grow by more than 300% over the next 5 years



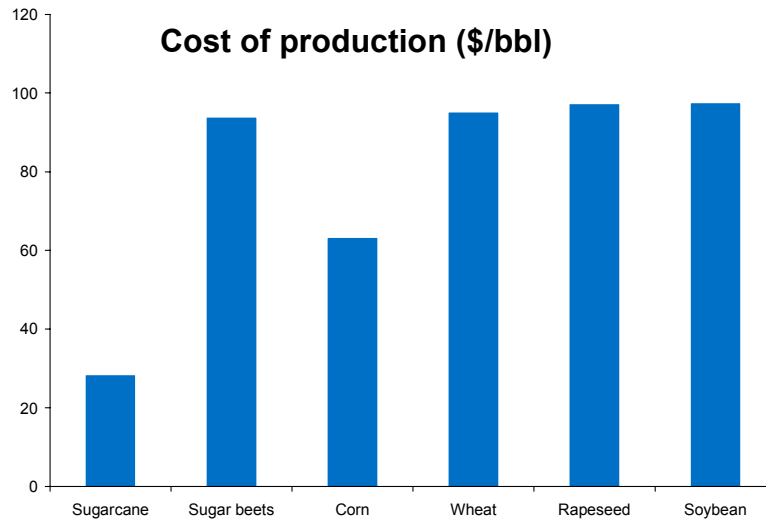
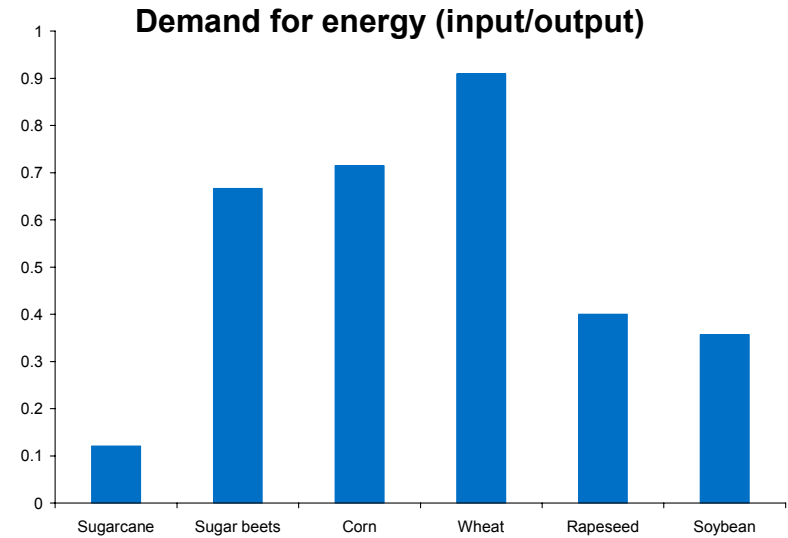
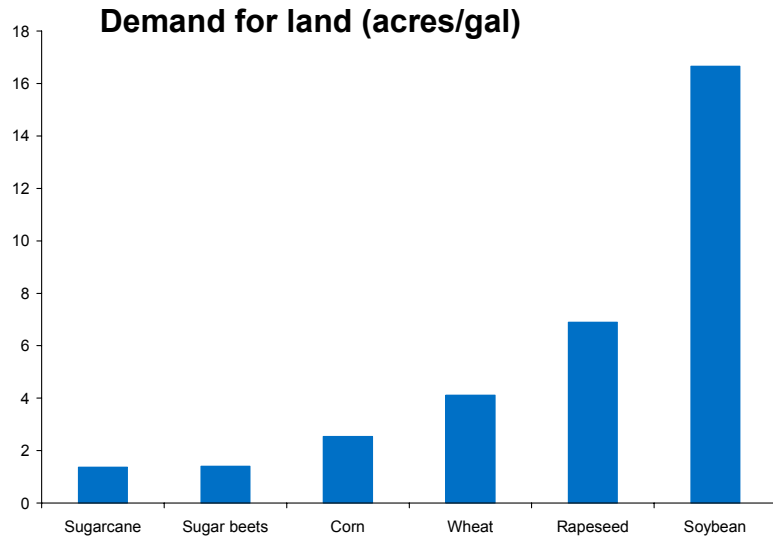
Source: Goldman Sachs Commodity Research.

However the demand for land will be the greater from bio-diesel (vegetable oils)



Source: Goldman Sachs Commodity Research.

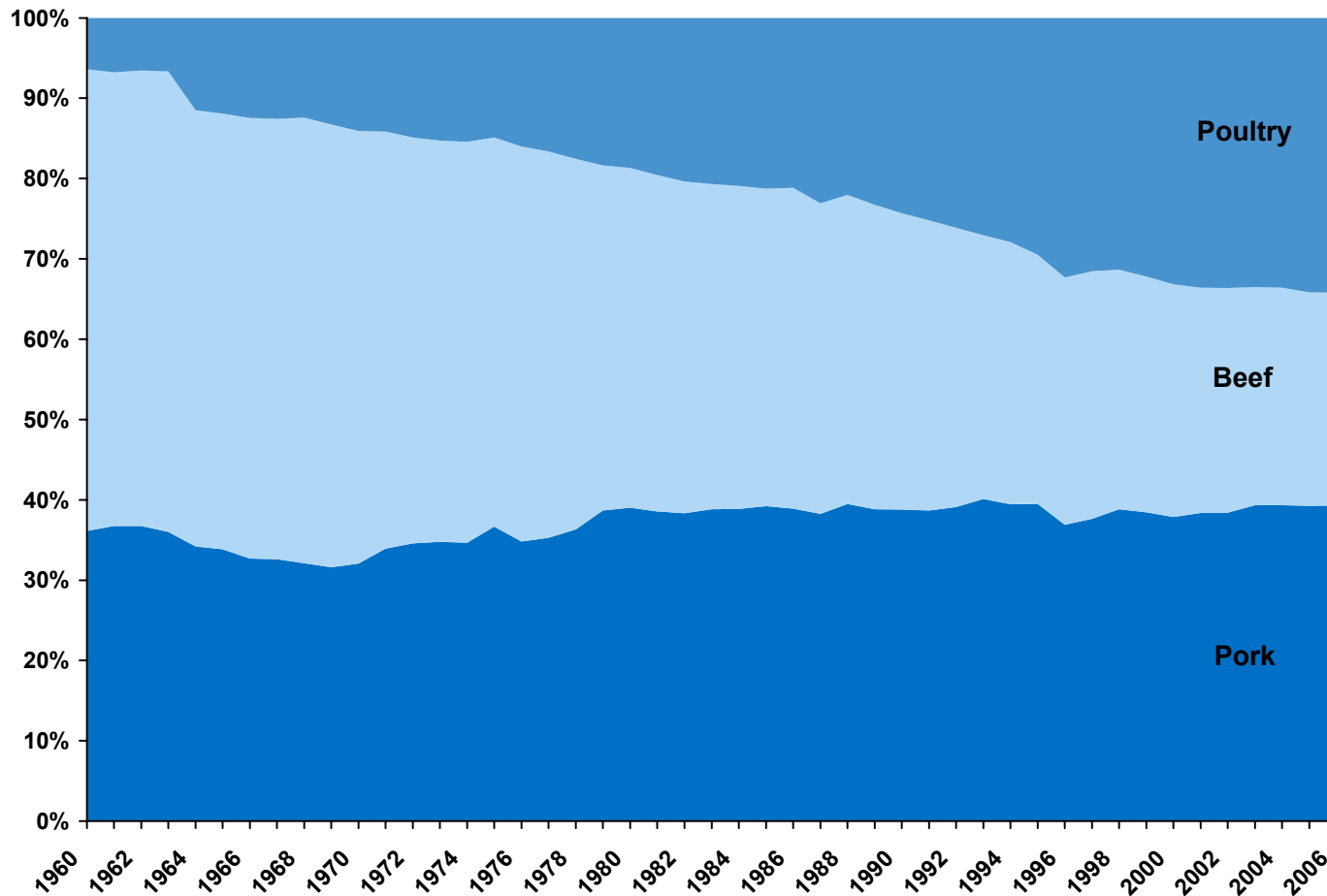
Which technology would you choose?



Source: Goldman Sachs Commodity Research

Demand for meat has shifted towards high protein, low fat poultry at the expense of beef

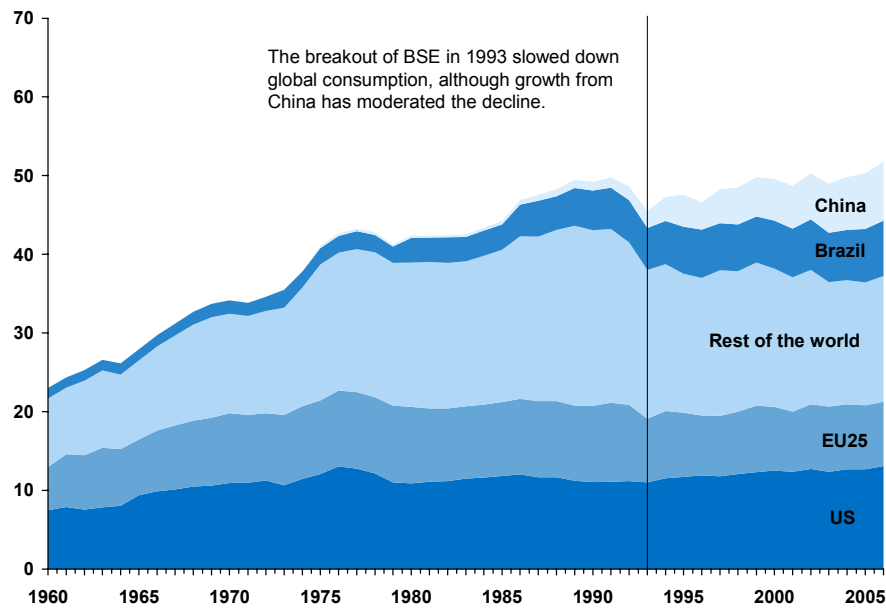
Per capita protein consumption share: %



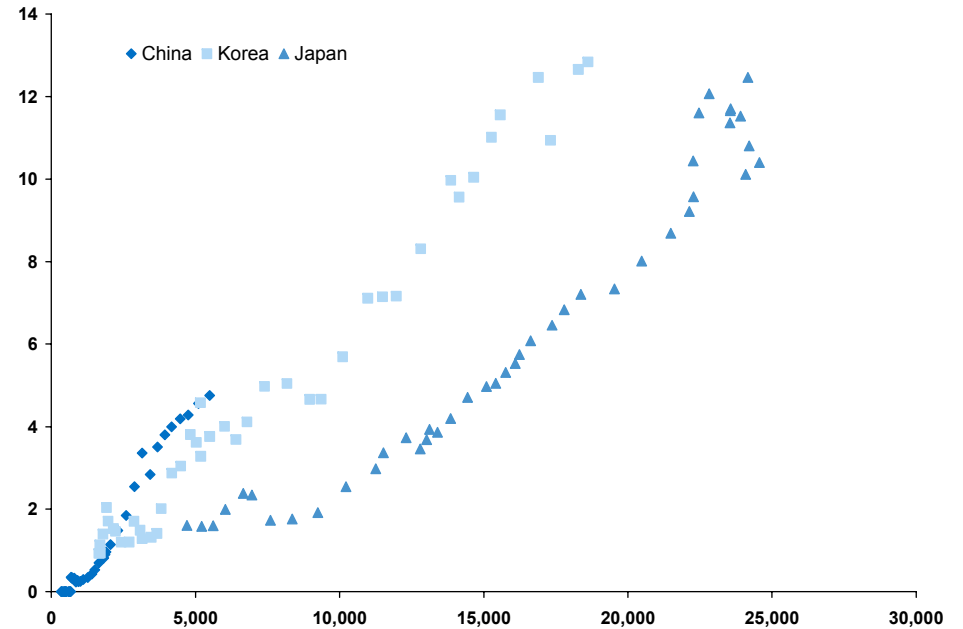
Source: USDA and Goldman Sachs Commodity Research.

However, the shift is mostly seen in developed countries; rising wealth in China and Brazil will likely continue to support beef demand

Beef consumption, million tons



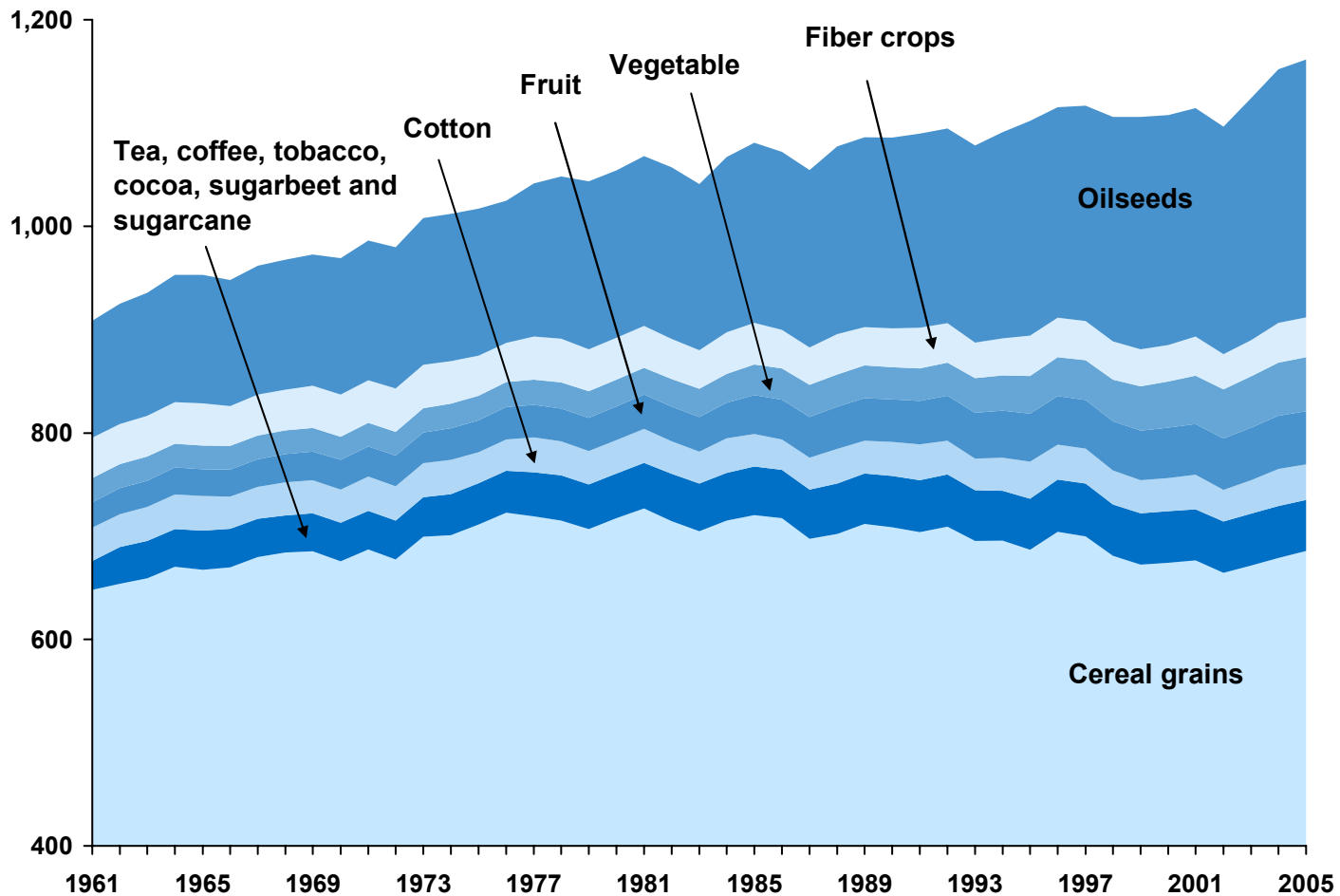
kg of beef per capita (vertical axis);
Real GDP PPP per capita (horizontal axis)



Source: USDA, Goldman Sachs Commodity Research.

Oilseed meals has replaced cereals to be an important protein source for livestock, reflected in land expanded for oilseed crops

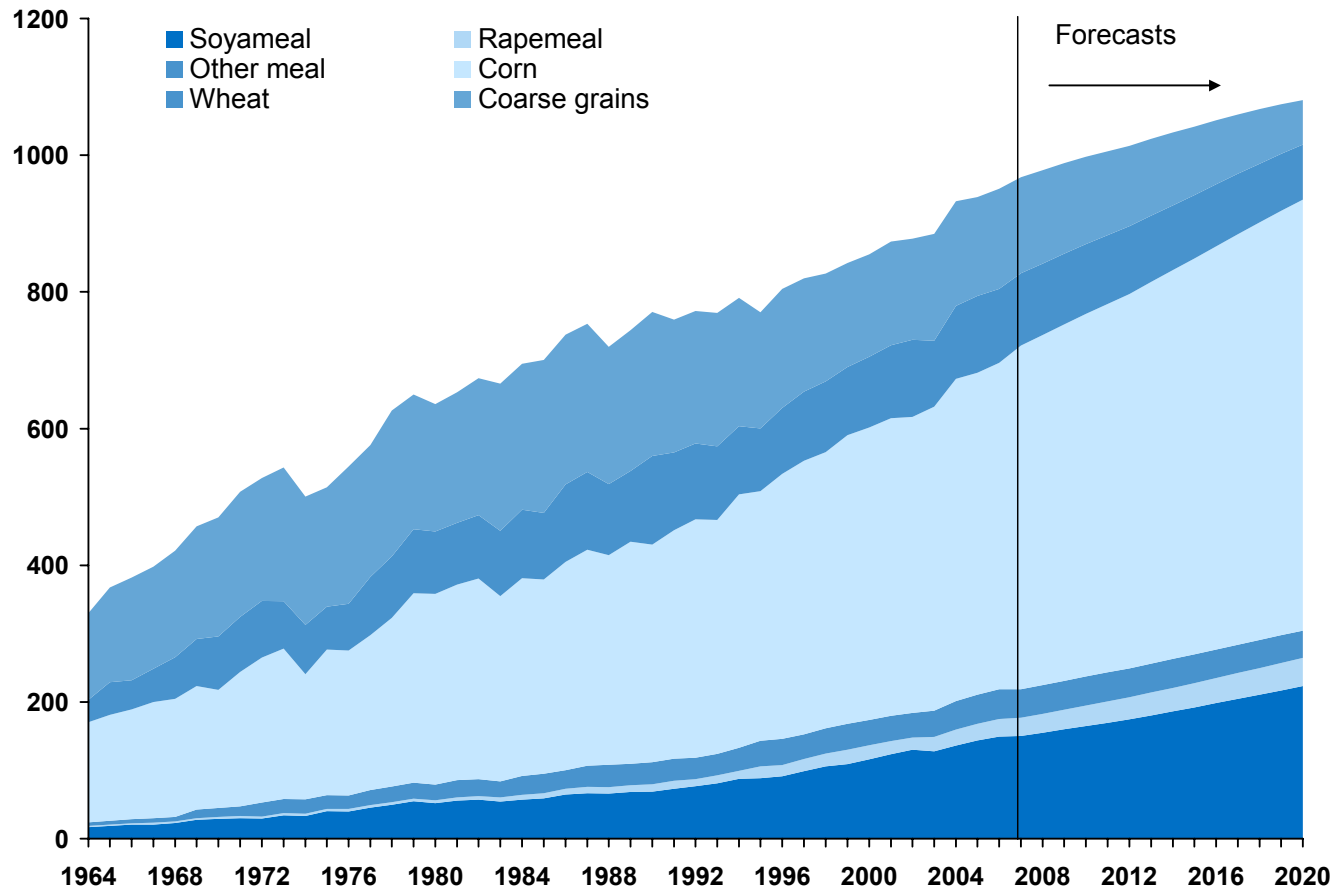
Land sown to all crops globally, million hectares



Source: FAO and Goldman Sachs Commodity Research.

We expect demand for corn and soybeans to remain strong, as they are major feed sources

Global feed grains demand, million metric tons

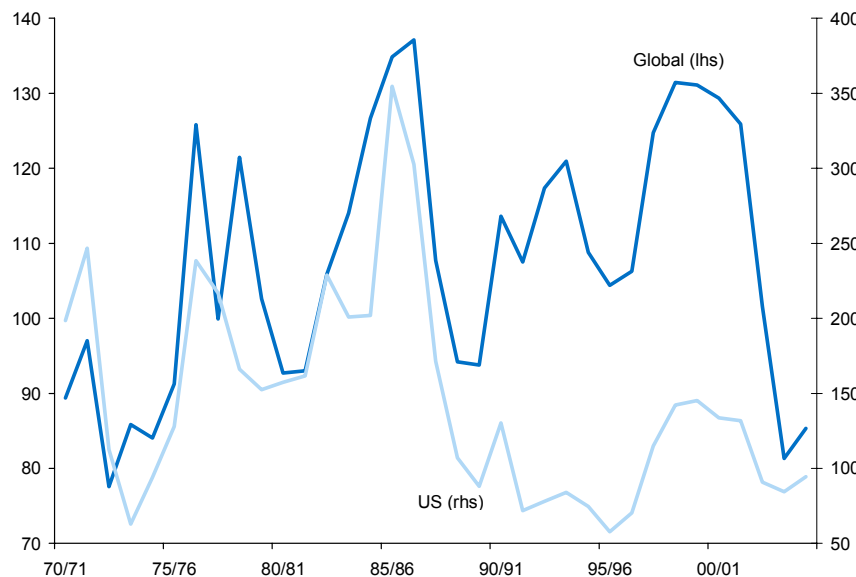


Source: USDA and Goldman Sachs Commodity Research.

Near-term upside is seen in wheat and corn, whose inventories are near historical lows

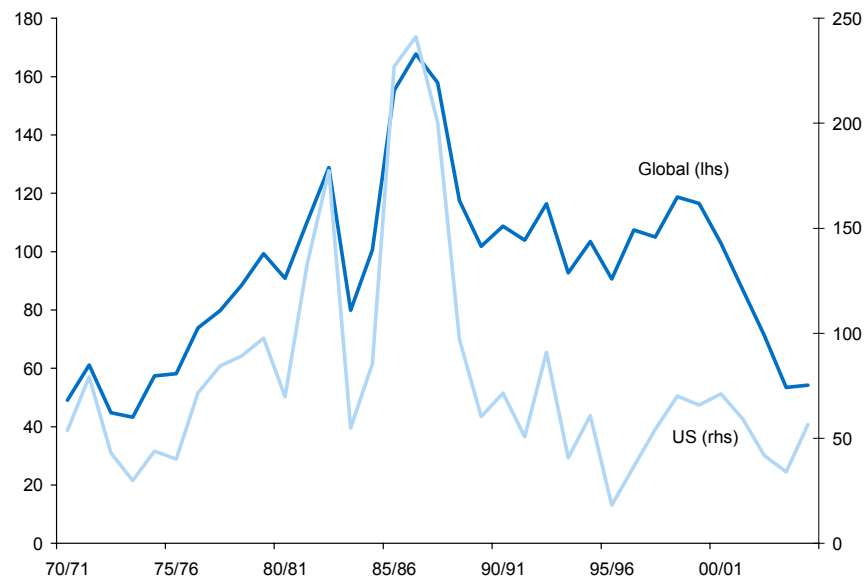
Wheat inventories

Days of forward coverage



Corn inventories

Days of forward coverage



Source: USDA, Goldman Sachs Commodity Research.

Disclosures

September 4, 2006

Disclosures

Distribution of ratings/investment banking relationships

Goldman Sachs Investment Research global coverage universe

	Rating Distribution			Investment Banking Relationships		
	Buy	Hold	Sell	Buy	Hold	Sell
Global	27%	59%	14%	57%	49%	45%

As of July 1, 2006, Goldman Sachs Global Investment Research had investment ratings on 2,129 equity securities. Prior to June 24, 2006, Goldman Sachs utilized a relative rating system of Outperform, In-Line and Underperform, which, for the purposes of the above disclosure required by NASD/NYSE rules, equated to Buy, Hold and Sell. As of June 24, 2006, Goldman Sachs assigns stocks as Buys and Sells on various regional Investment Lists; stocks not so assigned are deemed Neutral. Such assignments equate to Buy, Hold and Sell for the purposes of the above disclosure. See 'Ratings, Coverage groups and views and related definitions' below.

Regulatory disclosures

Disclosures required by United States laws and regulations

See company-specific regulatory disclosures above for any of the following disclosures required as to companies referred to in this report: manager or co-manager in a pending transaction; 1% or other ownership; compensation for certain services; types of client relationships; managed/co-managed public offerings in prior periods; directorships; market making and/or specialist role.

The following are additional required disclosures: **Ownership and material conflicts of interest:** Goldman Sachs policy prohibits its analysts, professionals reporting to analysts and members of their households from owning securities of any company in the analyst's area of coverage. **Analyst compensation:** Analysts are paid in part based on the profitability of Goldman Sachs, which includes investment banking revenues. **Analyst as officer or director:** Goldman Sachs policy prohibits its analysts, persons reporting to analysts or members of their households from serving as an officer, director, advisory board member or employee of any company in the analyst's area of coverage. **Distribution of ratings:** See the distribution of ratings disclosure above. **Price chart:** See the price chart, with changes of ratings and price targets in prior periods, above, or, if electronic format or if with respect to multiple companies which are the subject of this report, on the Goldman Sachs website at <http://www.gs.com/research/hedge.html>.

Additional disclosures required under the laws and regulations of jurisdictions other than the United States

The following disclosures are those required by the jurisdiction indicated, except to the extent already made above pursuant to United States laws and regulations. **Australia:** This research, and any access to it, is intended only for "wholesale clients" within the meaning of the Australian Corporations Act. **Canada:** Goldman Sachs Canada Inc. has approved of, and agreed to take responsibility for, this research in Canada if and to the extent it relates to equity securities of Canadian issuers. Analysts may conduct site visits but are prohibited from accepting payment or reimbursement by the company of travel expenses for such visits. **Hong Kong:** Further information on the securities of covered companies referred to in this research may be obtained on request from Goldman Sachs (Asia) L.L.C. **Japan:** See company-specific disclosures as to any applicable disclosures required by Japanese stock exchanges, the Japanese Securities Dealers Association or the Japanese Securities Finance Company. **Korea:** Further information on the subject company or companies referred to in this research may be obtained from Goldman Sachs (Asia) L.L.C., Seoul Branch. **Singapore:** Further information on the covered companies referred to in this research may be obtained from Goldman Sachs (Singapore) Pte. (Company Number: 198602165W). **United Kingdom:** Persons who would be categorized as private customers in the United Kingdom, as such term is defined in the rules of the Financial Services Authority, should read this research in conjunction with prior Goldman Sachs research on the covered companies referred to herein and should refer to the risk warnings that have been sent to them by Goldman Sachs International. A copy of these risks warnings, and a glossary of certain financial terms used in this report, are available from Goldman Sachs International on request.

European Union: Disclosure information in relation to Article 4 (1) (d) and Article 6 (2) of the European Commission Directive 2003/126/EC is available at http://www.gs.com/client_services/global_investment_research/europeanpolicy.html

Ratings, coverage groups and views and related definitions

Buy (B), Neutral (N), Sell (S) – Analysts recommend stocks as Buys or Sells for inclusion on various regional Investment Lists. Being assigned a Buy or Sell on an Investment List is determined by a stock's return potential relative to its coverage group as described below. Any stock not assigned as a Buy or a Sell on an Investment List is deemed Neutral. Each regional Investment Review Committee manages various regional Investment Lists to a global guideline of 25%-35% of stocks as Buy and 10%-15% of stocks as Sell; however, the distribution of Buys and Sells in any particular coverage group may vary as determined by the regional Investment Review Committee. Regional Conviction Buy and Sell lists represent investment recommendations focused on either the size of the potential return or the likelihood of the realization of the return.

Return potential represents the price differential between the current share price and the price target expected during the time horizon associated with the price target. Price targets are required for all covered stocks. The return potential, price target and associated time horizon are stated in each report adding or reiterating an Investment List membership.

Coverage groups and views: A list of all stocks in each coverage group is available by primary analyst, stock and coverage group at <http://www.gs.com/research/hedge.html>. The analyst assigns one of the following coverage views which represents the analyst's investment outlook on the coverage group relative to the group's historical fundamentals and/or valuation. **Attractive (A)**. The investment outlook over the following 12 months is favorable relative to the coverage group's historical fundamentals and/or valuation. **Neutral (N)**. The investment outlook over the following 12 months is neutral relative to the coverage group's historical fundamentals and/or valuation. **Cautious (C)**. The investment outlook over the following 12 months is unfavorable relative to the coverage group's historical fundamentals and/or valuation.

Not Rated (NR). The investment rating and target price, if any, have been removed pursuant to Goldman Sachs policy when Goldman Sachs is acting in an advisory capacity in a merger or strategic transaction involving this company and in certain other circumstances. **Rating Suspended (RS)**. Goldman Sachs Research has suspended the investment rating and price target, if any, for this stock, because there is not a sufficient fundamental basis for determining an investment rating or target. The previous investment rating and price target, if any, are no longer in effect for this stock and should not be relied upon. **Coverage Suspended (CS)**. Goldman Sachs has suspended coverage of this company. **Not Covered (NC)**. Goldman Sachs does not cover this company. **Not Available or Not Applicable (NA)**. The information is not available for display or is not applicable. **Not Meaningful (NM)**. The information is not meaningful and is therefore excluded.

Ratings, coverage views and related definitions prior to June 26, 2006

Our rating system requires that analysts rank order the stocks in their coverage groups and assign one of three investment ratings (see definitions below) within a ratings distribution guideline of no more than 25% of the stocks should be rated Outperform and no fewer than 10% rated Underperform. The analyst assigns one of three coverage views (see definitions below), which represents the analyst's investment outlook on the coverage group relative to the group's historical fundamentals and valuation. Each coverage group, listing all stocks covered in that group, is available by primary analyst, stock and coverage group at <http://www.gs.com/research/hedge.html>.

Definitions

Outperform (OP). We expect this stock to outperform the median total return for the analyst's coverage universe over the next 12 months. **In-Line (IL)**. We expect this stock to perform in line with the median total return for the analyst's coverage universe over the next 12 months. **Underperform (U)**. We expect this stock to underperform the median total return for the analyst's coverage universe over the next 12 months.

Coverage views: Attractive (A). The investment outlook over the following 12 months is favorable relative to the coverage group's historical fundamentals and/or valuation. **Neutral (N)**. The investment outlook over the following 12 months is neutral relative to the coverage group's historical fundamentals and/or valuation. **Cautious (C)**. The investment outlook over the following 12 months is unfavorable relative to the coverage group's historical fundamentals and/or valuation.

Current Investment List (CIL). We expect stocks on this list to provide an absolute total return of approximately 15%-20% over the next 12 months. We only assign this designation to stocks rated Outperform. We require a 12-month price target for stocks with this designation. Each stock on the CIL will **automatically** come off the list after 90 days unless renewed by the covering analyst and the relevant Regional Investment Review Committee.

Global product; distributing entities

The Global Investment Research Division of Goldman Sachs produces and distributes research products for clients of Goldman Sachs, and pursuant to certain contractual arrangements, on a global basis. Analysts based in Goldman Sachs offices around the world produce equity research on industries and companies, and research on macroeconomics, currencies, commodities and portfolio strategy.

This research is disseminated in Australia by Goldman Sachs JBWere Pty Ltd (ABN 21 006 797 897) on behalf of Goldman Sachs; in Canada by Goldman Sachs Canada Inc. regarding Canadian equities and by Goldman Sachs & Co. (all other research); in Germany by Goldman Sachs & Co. oHG; in Hong Kong by Goldman Sachs (Asia) L.L.C.; in Japan by Goldman Sachs (Japan) Ltd; in the Republic of Korea by Goldman Sachs (Asia) L.L.C., Seoul Branch; in New Zealand by Goldman Sachs JBWere (NZ) Limited on behalf of Goldman Sachs; in Singapore by Goldman Sachs (Singapore) Pte. (Company Number: 198602165W); and in the United States of America by Goldman, Sachs & Co. Goldman Sachs International has approved this research in connection with its distribution in the United Kingdom and European Union.

European Union: Goldman Sachs International, authorised and regulated by the Financial Services Authority, has approved this research in connection with its distribution in the European Union and United Kingdom; Goldman, Sachs & Co. oHG, regulated by the Bundesanstalt für Finanzdienstleistungsaufsicht, may also be distributing research in Germany

General disclosures in addition to specific disclosures required by certain jurisdictions

This research is for our clients only. Other than disclosures relating to Goldman Sachs, this research is based on current public information that we consider reliable, but we do not represent it is accurate or complete, and it should not be relied on as such. We seek to update our research as appropriate, but various regulations may prevent us from doing so. Other than some industry reports published on a periodic basis, the large majority of reports are published at irregular intervals as appropriate in the analyst's judgment.

Goldman Sachs conducts a global full-service, integrated investment banking, investment management, and brokerage business. We have investment banking and other business relationships with a substantial percentage of the companies covered by our Global Investment Research Division.

Our salespeople, traders, and other professionals may provide oral or written market commentary or trading strategies to our clients and our proprietary trading desks that reflect opinions that are contrary to the opinions expressed in this research. Our asset management area, our proprietary trading desks and investing businesses may make investment decisions that are inconsistent with the recommendations or views expressed in this research.

We and our affiliates, officers, directors, and employees, excluding equity analysts, will from time to time have long or short positions in, act as principal in, and buy or sell, the securities or derivatives (including options and warrants) thereof of covered companies referred to in this research.

This research is not an offer to sell or the solicitation of an offer to buy any security in any jurisdiction where such an offer or solicitation would be illegal. It does not constitute a personal recommendation or take into account the particular investment objectives, financial situations, or needs of individual clients. Clients should consider whether any advice or recommendation in this research is suitable for their particular circumstances and, if appropriate, seek professional advice, including tax advice. The price and value of the investments referred to in this research and the income from them may fluctuate. Past performance is not a guide to future performance, future returns are not guaranteed, and a loss of original capital may occur. Certain transactions, including those involving futures, options, and other derivatives, give rise to substantial risk and are not suitable for all investors. Current options disclosure documents are available from Goldman Sachs sales representatives or at <http://theocc.com/publications/risks/riskstoc.pdf>. Fluctuations in exchange rates could have adverse effects on the value or price of, or income derived from, certain investments.

Our research is disseminated primarily electronically, and, in some cases, in printed form. Electronic research is simultaneously available to all clients.

Disclosure information is also available at <http://www.gs.com/research/hedge.html> or from Research Compliance, One New York Plaza, New York, NY 10004.

Copyright 2006 The Goldman Sachs Group, Inc.

No part of this material may be (i) copied, photocopied or duplicated in any form by any means or (ii) redistributed without the prior written consent of The Goldman Sachs Group, Inc.