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TOP *of* MIND

WEIGHING THE GLP-1 MARKET

The newest generation of GLP-1 drugs are being hailed by some as "miracle drugs" for the treatment of obesity. But GLP-1s are expensive, insurance coverage is limited, and not everyone with obesity can or wants to take them. So, how large is the actual addressable market for GLP-1s? Obesity physician Dr. Fatima Cody Stanford argues that it's only a fraction of the 1 billion people worldwide who have obesity. GS' Chris Shibutani agrees that many factors will constrain market size in the near-to-medium term, though he expects the global GLP-1 market to grow to $100bn in 2030, and potentially much higher if more insurers cover GLP-1s and they show promise in treating other diseases, which GS' John Marshall estimates could result in a ~70mn US patient population. We then assess the implications for industries, the economy, and fiscal health, with GS' Joseph Briggs finding that wider GLP-1 adoption could meaningfully boost US growth while MIT's Jonathan Gruber warns that expanding insurance coverage for GLP-1s would cost the US government a staggering sum.

"GLP-1 medications will be helpful to/feasible for only a fraction of the 1 billion people globally who have obesity. So, though extremely promising, GLP-1s are not the silver bullet for weight loss that many people make them out to be.

- Dr. Fatima Cody Stanford

Our $100 billion [GLP-1 market size] projection has become much less controversial since we first published it last fall due to promising results from several additional outcomes studies, which present a clear argument that the market could be even larger.

- Chris Shibutani

If 40% of all Americans with obesity took these drugs at current prices—roughly $15,000 per year per person—[the bill] would total over $1 trillion annually... That is almost as much as the government spends on the entire Medicare program... So, it's a staggering figure.

- Jonathan Gruber"

WHAT'S INSIDE

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Macro news and views

We provide a brief snapshot on the most important economies for the global markets

US

Latest GS proprietary datapoints/major changes in views

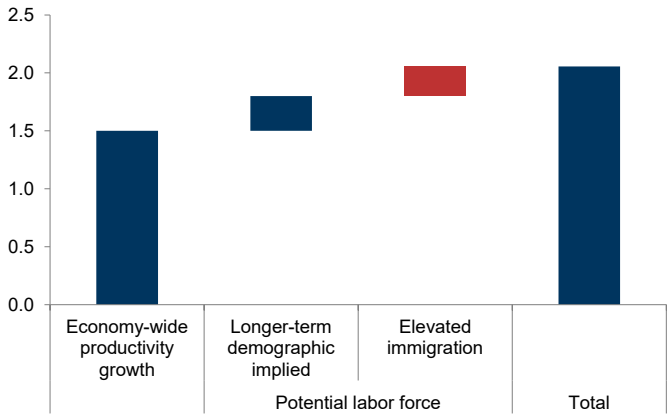
- We recently pushed back our forecast for the first Fed rate cut to July from June following stronger-than-expected March CPI data, after which we expect rate cuts to proceed at a quarterly pace with the next 25bp cut in Nov.

Datapoints/trends we're focused on

- US 2024 growth and inflation; we continue to expect both strong GDP growth of 2.5% (Q4/Q4) and a meaningful decline in inflation, and don't see the two as contradictory.
- US election, which will have important implications for policy, including fiscal policy, with a divided government likely to show the most restraint in this regard.
- Immigration surge, which is boosting potential US GDP growth.

An immigration boost to potential US growth

Contributions to 2024 potential US GDP growth, GS estimates, pp



Source: Goldman Sachs GIR.

Japan

Latest GS proprietary datapoints/major changes in views

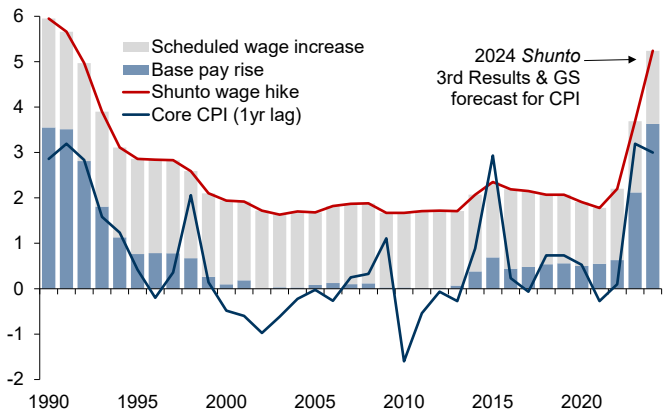
- No major changes in views.

Datapoints/trends we're focused on

- BoJ policy; we see some room for another BoJ rate hike in the near future on the back of Governor Ueda's remarks at the March BoJ press conference and expect the BoJ policy rate to rise to 0.25-0.5% by end-2025.
- 2024 *shunto* wage negotiations, which were the strongest in ~30 years, with an agreed base pay rise of 3.63% yoy, though the rise was much lower in some service industries.
- Japan inbound spending, which remains around historic highs, partly on the back of the Lunar New Year holidays.

Japanese *shunto* negotiations: hiking on

Shunto wage increases and core CPI, % change, yoy



Source: JTUC-Rengo, Ministry of Internal Affairs & Communications, GS GIR.

Europe

Latest GS proprietary datapoints/major changes in views

- We now expect four ECB cuts in 2024 (vs. five before) and three cuts in 2025 (vs. two before) as we expect the ECB to slow to a quarterly pace after sequential cuts in Jun, Jul, and Sept given the shifting global monetary policy outlook, better forward-looking growth indicators, & sticky services inflation.
- We now expect the BoE to slow to a quarterly pace of cuts from 4Q24 on, for a total of four cuts in 2024 (vs. 5 before), four in 2025 (no change) and one in 2026 (vs. none before).
- We lowered our Dec 2024 EA core inflation forecast to 2.3% yoy (from 2.4%) after weaker-than-expected Mar inflation data.

Datapoints/trends we're focused on

- German industrial sector, which will likely remain challenged.

German industrial production: sputtering out

German industrial production growth, %

Source: Haver Analytics, Goldman Sachs GIR.

Emerging Markets (EM)

Latest GS proprietary datapoints/major changes in views

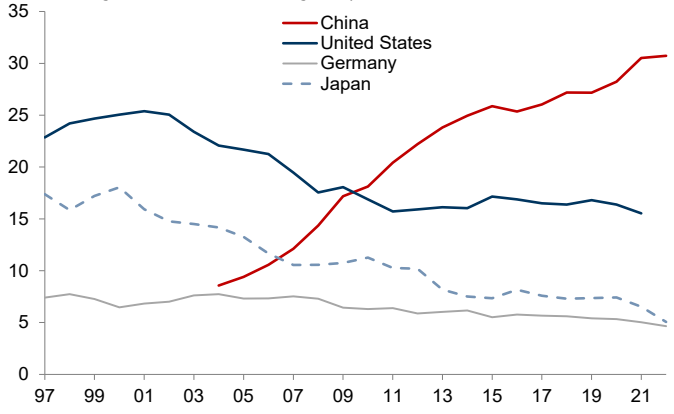
- We raised our 1Q24 China real GDP growth forecast to 7.5% (qoq ann, from 5.6%) on manufacturing strength but lowered our Q2 forecast to 3% (from 4.8%), partly as policymakers may step away from easing in the near term given robust Q1 growth, bringing our full year forecast to 5.0% yoy (vs. 4.8%).

Datapoints/trends we're focused on

- China's manufacturing sector, which we expect to continue enjoying substantial policy support over coming years, partly due to the sector's importance for China's development.
- India general elections, which begin April 19, with polls showing the incumbent NDA in a comfortable lead, with an NDA win likely contributing to a stable macro environment.

China manufacturing: still dominating

Share of global manufacturing output, %



Source: World Bank, Goldman Sachs GIR.

Weighing the GLP-1 market

The newest generation of GLP-1 drugs, including Novo Nordisk's Wegovy and Eli Lilly's Zepbound, are being hailed by some as "miracle drugs" for the treatment of obesity—a chronic disease that affects over 1 billion people globally—given their far higher weight loss efficacy than other drugs and long safety track record for the treatment of diabetes. But US prices for these drugs are sky-high (~$15k/yr), insurance coverage is limited and, even more fundamentally, not all people with obesity can or even want to take them. Just how large the addressable market for GLP-1s actually is, and what that means for the drug companies developing them, other exposed industries, and the wider economy, is Top of Mind.

We first turn to Dr. Fatima Cody Stanford, an obesity medicine physician and scientist at Massachusetts General Hospital and Harvard Medical School, to understand how GLP-1s work and what makes them so effective. She explains that GLP-1 drugs are the first in a long history of weight-loss medications to directly target the critical brain pathways that regulate food intake and storage, so people don't crave food as much or feel as hungry. This, she says, is proving to be a very effective strategy for weight loss, with the dual agonists that combine GLP-1 and GIP leading to 22.5% average weight loss versus the single-digit average of other medications.

With efficacy so high, market excitement around the potential for widespread usage of GLP-1s has surged over the past six months. But is the addressable market for GLP-1s really that large? Stanford argues that while GLP-1s are a promising weight-loss tool, the market for them is only a fraction of the people who have obesity. This, she says, owes partly to some patients experiencing little-to-no weight loss on GLP-1s as well as to the reality that some patients aren't medically able or even willing to take them, especially since these medications are injected by a needle and are only shown to be effective as long as patients continue taking them. Stanford also observes that a lack of insurance coverage by both private insurers and Medicare—which currently doesn't cover GLP-1s solely for obesity—is a major obstacle to usage.

GS US biopharmaceuticals analyst Chris Shibutani agrees that these impediments—in addition to supply scarcity as ramping up production of these drugs to meet even current demand is no easy task—will likely constrain the size of the GLP-1 market in the near-to-medium term. He nevertheless assumes that the US patient population will grow from around 2 million people today to 15 million in 2030—~14% of the US adult population with obesity—which would increase the size of the GLP-1 market from ~$10 billion today to $100 billion in 2030.

This number, however, would likely rise substantially if more insurers than we assume covered these drugs. So, just how likely is that? On the private side, GS US managed care analyst Nathan Rich expects employer coverage to increase from roughly 50% of employers today owing to rising employee demand and GLP-1s' demonstrated health benefits. But he thinks that a lower price point, potentially due to increased competition, would go a long way in increasing private insurers' comfort with expanding coverage. The outlook for coverage is more questionable on the public side, with Shibutani assuming only a 50% likelihood that Medicare will cover anti-obesity drugs, given that Congress prohibits Medicare from covering this class of drugs today and their budget-busting price tag.

But that could change if GLP-1 drugs show promise in treating serious health conditions beyond obesity. This has already started to happen, with the FDA's recent approval of Wegovy for the prevention of heart disease leading to Medicare coverage of the drug for this indication. And studies for the treatment of sleep apnea, liver disease, and other diseases could have similarly promising outcomes, which could raise the odds of Medicare coverage and increase the US GLP-1 patient population far beyond the 15 million Shibutani assumes. Indeed, GS Head of Derivatives Research John Marshall finds that success across all the studies currently in progress could result in nearly 70 million US patients taking GLP-1s in 2028. This would have knock-on effects far beyond the pharmaceutical sector, with industries ranging from beauty products to airlines to medtech considering the implications of these drugs, and GS US consumer staples analyst Bonnie Herzog noting that Food companies are trading at a sizable discount as investors consider what greater GLP-1 use could mean for the industry.

And what about implications for the broader economy? GS senior global economist Joseph Briggs finds that widespread adoption of GLP-1 drugs—and the associated improvement in health outcomes—could have meaningfully positive impacts on economic growth. He estimates that the level of US GDP could increase by 0.4% if 30 million Americans take these drugs, with the GDP impact rising to over 1% in Marshall's upside case of a nearly 70 million patient population.

But would this boon to growth come at the expense of US fiscal health? MIT's Jonathan Gruber warns that providing insurance coverage for GLP-1s to even less than half the US population with obesity at current prices would cost the US government a "staggering" sum—almost as much as the government spends on the entire Medicare program today. To address this issue, Gruber argues that the US should do what every other developed country has done: regulate drug prices. GS Chief US Political Economist Alec Phillips agrees that expanding Medicare coverage for GLP-1s to include people with obesity would be enormously expensive, and would also likely delay much-needed reforms to the Medicare program, but says compelling non-financial reasons to expand coverage may lead policymakers to do so anyway.

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Interview with Dr. Fatima Cody Stanford

Fatima Cody Stanford, MD, MPH, MPA, MBA, FAAP, FACP, FAHA, FAMWA, FTOS is an obesity medicine physician, scientist, educator, and policymaker at Massachusetts General Hospital and Harvard Medical School. Below, she argues that GLP-1 medications are a promising tool for many—but not all—people with obesity and will not solve the obesity crisis.

The views stated herein are those of the interviewee and do not necessarily reflect those of Goldman Sachs.

Allison Nathan: You have extensive clinical experience in the field of obesity medicine. What is obesity, and how prevalent is it?

Dr. Fatima Cody Stanford: Obesity is a complex, chronic, multifactorial disease that the American Medical Association (AMA) has recognized since 2013. It affects over 1 billion people worldwide, according to recently updated figures from *The Lancet*, and, in the US precisely, 42.4% of adults and 19.4% of the pediatric population per the latest National Health and Nutrition Examination Survey. Obesity is a disease because it has pathophysiology, which means it's associated with disordered physiological processes. Obesity regulation mostly begins in the brain, which communicates with the adipose organ, fat tissue, and the gut to regulate weight status. Two primary pathways of the brain regulate food intake and storage: the anorexigenic proopiomelanocortin (POMC), which tells us to eat less, and the orexigenic agouti-related peptide (AgRP), which does the opposite. These communicate with the adipose organ, which can become dysregulated, causing dysfunction within the human body that may lead to obesity.

Allison Nathan: Why has obesity proven such a complex disease to tackle?

Dr. Fatima Cody Stanford: People mistakenly believe that obesity is simply the result of poor diet and not enough exercise, but it's often much more complicated than that. Many factors can cause the dysregulation that leads to the disease, including genetics, development, environment, and behavior. Over 100 different ways exist by which an individual may develop obesity. For example, a person may have experienced trauma and associated immense stress as a child, and we know that stress leads to the storage of adipose.

Allison Nathan: Much is being made of GLP-1 medications for the treatment of obesity today, but haven't these—and other weight-loss drugs—been around for a long time?

Dr. Fatima Stanford: Yes. While the era of treating obesity with medications may seem like it began just a few years ago, FDA-approved anti-obesity medications have been around since 1933, starting with 2,4-Dinitrophenol (DNP), which was ultimately withdrawn from the market due to serious side effects, including death, to methamphetamine, approved in 1947 and withdrawn only in 1979 due to high risk of abusiveness and addiction, to nearly a dozen other drugs—some of which were also ultimately withdrawn but many that are still in use today such as phentermine (approved in 1959), topiramate (approved in combination with phentermine in 2012) and bupropion/naltrexone (approved in 2014)—and to the first generation of glucagon-like peptide-1 (GLP-1) drugs, which the FDA approved in 2014.

Allison Nathan: So, what differentiates GLP-1s from past iterations of weight-loss drugs?

Dr. Fatima Cody Stanford: GLP-1 drugs represent an inflection point in obesity treatment because they're the first medication that works by targeting the critical pathways of the brain that regulate food intake and storage. Phentermine inhibits norepinephrine reuptake within the hypothalamus, which induces a feeling of fullness. Topiramate, combined with phentermine, stimulates gamma-aminobutyric acid (GABA) within the brain, reducing food intake and weight gain. Bupropion/naltrexone affects the reward pathways of the brain that influence food cravings. GLP-1 medications, by contrast, directly affect the food pathways, stimulating the POMC and decreasing the AgRP so that a person doesn't eat as much or feel as hungry.

It's essential to recognize that everyone has GLP-1s inside their body. The gut releases GLP-1 hormones into the bloodstream in response to food intake, and these hormones reduce appetite and stimulate insulin release. No test exists to determine how much GLP-1 a person has inside them, but a physician can get a sense just by asking a patient how often they think about food or feel hungry. Those with more GLP-1s tend to have such thoughts less frequently, while those with less tend to be more preoccupied with food and eating. Administering GLP-1 medications, which mimic the actions of the naturally occurring hormone, can help curb such thoughts.

Allison Nathan: If GLP-1s have been around for a decade, why are they garnering so much attention today?

Dr. Fatima Cody Stanford: Even though this class of drugs has been available for a decade, the current generation of GLP-1 medications has higher efficacy in treating obesity than past generations of the drug and other weight-loss medications. Liraglutide, the first generation of GLP-1s, led to only around 6.5% total body weight loss, compared to close to 10% for phentermine topiramate. Semaglutide, the second generation of GLP-1s approved in 2021 that includes Ozempic—the trade name for the treatment of diabetes—and Wegovy—the trade name for the treatment of obesity—has led to around 14.9% total body weight loss. The comparable figure for tirzepatide, which is a dual agonist combining GLP-1 and glucose-dependent insulinotropic polypeptide (GIP) that the FDA approved in November 2023, is around 22.5%. So, it took the introduction of second-generation GLP-1s to cross the 10% weight-loss threshold and the dual agonist to cross the 20% threshold. When that happened, the world took notice.

Allison Nathan: Given this much higher efficacy, are GLP-1 medications a silver bullet in promoting weight loss?

Dr. Fatima Cody Stanford: No. Even though the average total body weight loss on GLP-1s is significant, a wide range of outcomes exists, with some patients being non or minimal responders. For example, one of my patients taking 2.4 milligrams/week—the highest dosage—of semaglutide saw a dramatic improvement in blood sugar levels but lost only one pound, making them a non-responder for weight regulation. According to Wilding's semaglutide study and Jastreboff's tirzepatide study, around 10-15% of GLP-1 patients are minimal/non-responders, though among my patient population, which is more demographically diverse than those participating in clinical trials, that figure is closer to 20%. We don't know for sure why that is; I suspect it's because the pathways in the brain that the GLP-1s are targeting ultimately are not the ones causing dysfunction, and perhaps these patients need norepinephrine inhibition, GABA stimulation, or changes to their reward pathways instead, although that is unknowable until we start treatment. But that is why I never describe GLP-1s as "game changers" or "miracle drugs".

> "I never describe GLP-1s as "game changers" or "miracle drugs".

Allison Nathan: So, GLP-1s won't solve the obesity crisis?

Dr. Fatima Cody Stanford: No. GLP-1s are a remarkable tool for various patients, and the addressable market for these medications is very large. Still, it is not the entirety of the 1 billion people worldwide living with obesity, for several reasons. First, other treatments are more appropriate for many patients. For some, lifestyle changes on their own will be efficacious. For patients with severe obesity and Type-2 diabetes, surgical intervention remains by far the most effective treatment option. While I prescribe anti-obesity medications to 90%+ of my patients who have undergone metabolic and bariatric surgery to help them keep the weight off and, in some cases, lose even more, surgery on its own can place 80%+ of patients with Type-2 diabetes in remission from the disease within 4-5 days after surgery. No medication can produce such results, not even the emerging triple agonists that combine GLP-1, GIP, and glucagon. And older treatments still on the market work very well for some patients. I prescribe phentermine topiramate and bupropion/naltrexone quite frequently and have patients who have lost 45-50% of their total body weight on these agents.

Second, some people may have contraindications, meaning that a GLP-1 shouldn't be prescribed because it may harm them. That includes patients with a history of medullary thyroid cancer, multiple endocrine neoplasia type 2, and pancreatitis, as well as those who are pregnant or breastfeeding, among other contradictions.

Third, GLP-1s can cause side effects that some patients may not tolerate, ranging from mild ones like fatigue, nausea, and vomiting to less common but more serious ones like gastroparesis, intestinal obstruction, and gallbladder disease.

And fourth, not every patient who has obesity and meets the qualifications for GLP-1 use wishes to do so. Baby boomers, for example, are not rushing the floodgates to use an injectable medication because they may not want to prick themselves with a needle every week. Boomers may be more amenable to a pill version of semaglutide, and the FDA is currently evaluating such a medication with analogous efficacy, orforglipron. However, the need to take it daily could still put some patients off these medications. Patients who take GLP-1s for weight loss will also most likely need to take them for the rest of their lives, which only some people are willing to do.

Allison Nathan: For people who can benefit from these drugs and want to take them, how prohibitive is the cost/lack of insurance coverage to usage?

Dr. Fatima Cody Stanford: Insurance coverage is a significant obstacle for many people and overcoming that obstacle has been incredibly frustrating. Currently, Medicare covers GLP-1 medications and dietician visits for patients with diabetes. In early March, the FDA approved Wegovy to prevent heart disease. Within a week, the Centers for Medicare & Medicaid Services (CMS) issued guidance allowing Medicare to cover semaglutide for patients with heart disease. However, despite the FDA approving GLP-1s for weight loss long ago, efforts to convince CMS to recognize obesity as a chronic disease that warrants chronic therapy by passing the Treat and Reduce Obesity Act (TROA) have failed for over a decade. So, Medicare doesn't currently cover GLP-1 medications for people with obesity. That's a huge problem; I see patients every day whose weight and metabolic profiles have improved tremendously while using these drugs that are covered by their private insurance but lose access to them once they hit Medicare age.

Private insurance coverage is also falling short. All private/employer-sponsored insurers in Massachusetts currently cover anti-obesity medications because some plans began covering them, which generated pressure for the rest of the plans to follow. However, national companies/insurers haven't felt that same pressure, and today, only around 50% of employers, at most, provide some coverage. So, insurance status governs the treatment strategy for these people. That may change now that Medicare is covering semaglutide for heart disease, which opens the door for coverage for obesity. And that could open the floodgates for more private insurance coverage because private insurers don't want to be behind Medicare. However, as of today, insurance coverage is a significant barrier to GLP-1 use.

These factors together make it clear that GLP-1 medications will be helpful to/feasible for only a fraction of the 1 billion people globally who have obesity. So, though extremely promising, GLP-1s are not the silver bullet for weight loss that many people make them out to be.

Interview with Chris Shibutani

Chris Shibutani, MD is US Biopharmaceuticals Senior Analyst at Goldman Sachs. Below, he argues that the global GLP-1 market could grow to $100 billion in 2030 as cost and supply constraints abate and insurance coverage expands.

Jenny Grimberg: You've projected that the global market for GLP-1 medications could grow to $100 billion in 2030, a significant increase from around $10 billion today. How did you arrive at that estimate?

Chris Shibutani: We estimate that roughly 105 million US adults meet the criteria for obesity/overweight today according to the World Health Organization's body mass index (BMI) classifications. Currently, we estimate that only around 2 million people take GLP-1s for weight loss, in part owing to the high cost and insurance coverage barriers, but also perhaps most notably to supply constraints. But as those constraints abate on the back of increased private insurance coverage and manufacturing ramp-ups, we expect that number to rise to ~15 million in 2030, which represents ~14% penetration into the US adult population with obesity. We assume those 15 million people will take the drug on average for 12 months, although the evidence suggests patients only maintain weight loss as long as they continue to take GLP-1s. And while we expect the gross list price for GLP-1 injectables to rise progressively as the supply-demand balance remains tight over the next few years, the discount between the gross price and the net price consumers pay should widen as insurance coverage expands and more competitors enter the market. We also expect oral GLP-1s, when they enter the market, to be priced at a 25% discount to injectables. Taken together, that brings us to a ~$85 billion US sales estimate, which, when extrapolated globally, leads us to the $100 billion total addressable market.

Jenny Grimberg: How have recent developments affected your expectations for the potential size of the market?

Chris Shibutani: Our $100 billion projection has become much less controversial since we first published it last fall due to promising results from several additional outcomes studies, which present a clear argument that the market could be even larger. The most notable study was Novo Nordisk's SELECT cardiovascular outcomes study that demonstrated a 20% reduction in major cardiovascular events in patients taking semaglutide (Wegovy), which was at the upper end of investor expectations. Other studies have shown significant benefits for diabetes patients with kidney disease, and expectations are high for studies on the potential benefits of GLP-1s, including Eli Lilly's Zepbound, for patients with sleep-related breathing disorders that should read out imminently. So, while we based our estimate of potential market size solely upon the use of GLP-1 drugs for weight loss, these drugs' clear benefits for patients with other serious health conditions could increase the US patient population beyond the 15 million we expect today.

The potential for widespread introduction of oral GLP-1s could also push our estimates higher. While oral therapies are still in clinical trials, they are poised to become an important aspect of chronic weight management treatment over the next several years, with Phase 2 studies showing promising results in terms of efficacy and tolerability. And with these treatments likely to cost less to manufacture, we see the potential for the price point to be lower than injectable GLP-1s, so more patients who would like to utilize GLP-1s for weight loss may be able to.

Jenny Grimberg: So, you are assuming a lower price point in your estimates?

Chris Shibutani: Yes, we assume GLP-1 prices overall across the anticipated range of product profiles will be somewhat lower by 2030 in part due to less expensive formats of the drugs becoming available but also due to increased competition as more companies develop similar drugs. Even if smaller players can't dominate the market, the sheer size of the market opportunity provides attractive revenue opportunities in sizable segments of the market. Overall, we see potential for the introduction of oral treatment options and the potential entry of competitor offerings to generate opportunities for the average cost of therapies across the entire landscape to fall.

Jenny Grimberg: What about your assumptions on insurance coverage? How do those factor in?

Chris Shibutani: A broadening of insurance coverage is another key assumption. Currently, almost 50% of commercially insured patients have access to GLP-1s through their employers who opt in to reimburse anti-obesity medications. Our $100 billion estimate assumes that employer coverage will increase to roughly 90% in 2030 based on the continued demonstration of broader healthcare benefits from a myriad of obesity-related diseases through ongoing studies, which could broaden the labeled indications for prescribing GLP-1s and, in turn, further support the argument for patients to gain access through broader coverage.

That said, we estimate that ~20% of Americans who would be considered eligible for GLP-1s as anti-obesity medications would seek to gain access through Medicare. However, Medicare is currently prohibited by law from covering medications for obesity and Medicaid only covers GLP-1s on a state-by-state basis, with only a handful of states opting in. While the recent promising outcomes studies results have enabled the introduction of limited coverage and raised the odds of coverage, we currently assume only a 50% likelihood that Medicare will cover anti-obesity medications in 2030 because the government has little incentive to cover a potentially budget-busting drug, especially amid already constrained budgets. The Congressional Budget Office (CBO) recently stated that, at current prices, anti-obesity medications would cost the federal government more than it would save from reducing other healthcare spending when using a 10-year forward calculation. So, insurance coverage, and, in turn, price will remain a constraint for a significant subset of people, but likely not one that prevents the market for GLP-1s from growing to the $100 billion we project in 2030.

Jenny Grimberg: Could drug manufacturers unilaterally lower prices in an effort to capture market share?

Chris Shibutani: Companies have not given any indication that they are considering price cuts. The GLP-1 market is currently in a fairly unique situation in that it essentially functions as a duopoly of Novo Nordisk and Eli Lilly. These companies benefit from significant longstanding competitive advantages, including highly relevant benefits from being at the forefront of scientific research in the GLP-1 space owing to their decades-long leadership in developing treatments for diabetes. And even with those advantages, they are not asleep at the wheel. They are leading research efforts with clinical development of potentially even more effective and tolerable GLP-1 treatments. For example, the profile for Lilly's orforglipron is currently considered the benchmark against which other oral GLP-1s in development are being measured against. So, no real incentive exists for the established players to unilaterally lower prices.

But that could change. The GLP-1 market is a global market, and markets outside the US may not be able to bear anywhere close to the current level of prices, especially those with single-payer healthcare systems. So, as supply ramps up, even established players may need to rethink their pricing strategies. Insurers restricting access to GLP-1 medications due to their high costs could also prompt manufacturers to consider pricing strategies that could encompass lower price points in certain patient segments and geographies. So, pricing will certainly be a key factor to watch, though even a lower price point likely wouldn't significantly affect our $100 billion estimate given the potential offset of enabling more people to access GLP-1s.

Jenny Grimberg: What about another potential constraint on market size—the supply of GLP-1s. Will manufacturers be able to ramp up supply to keep pace with increasing demand, especially given current shortages?

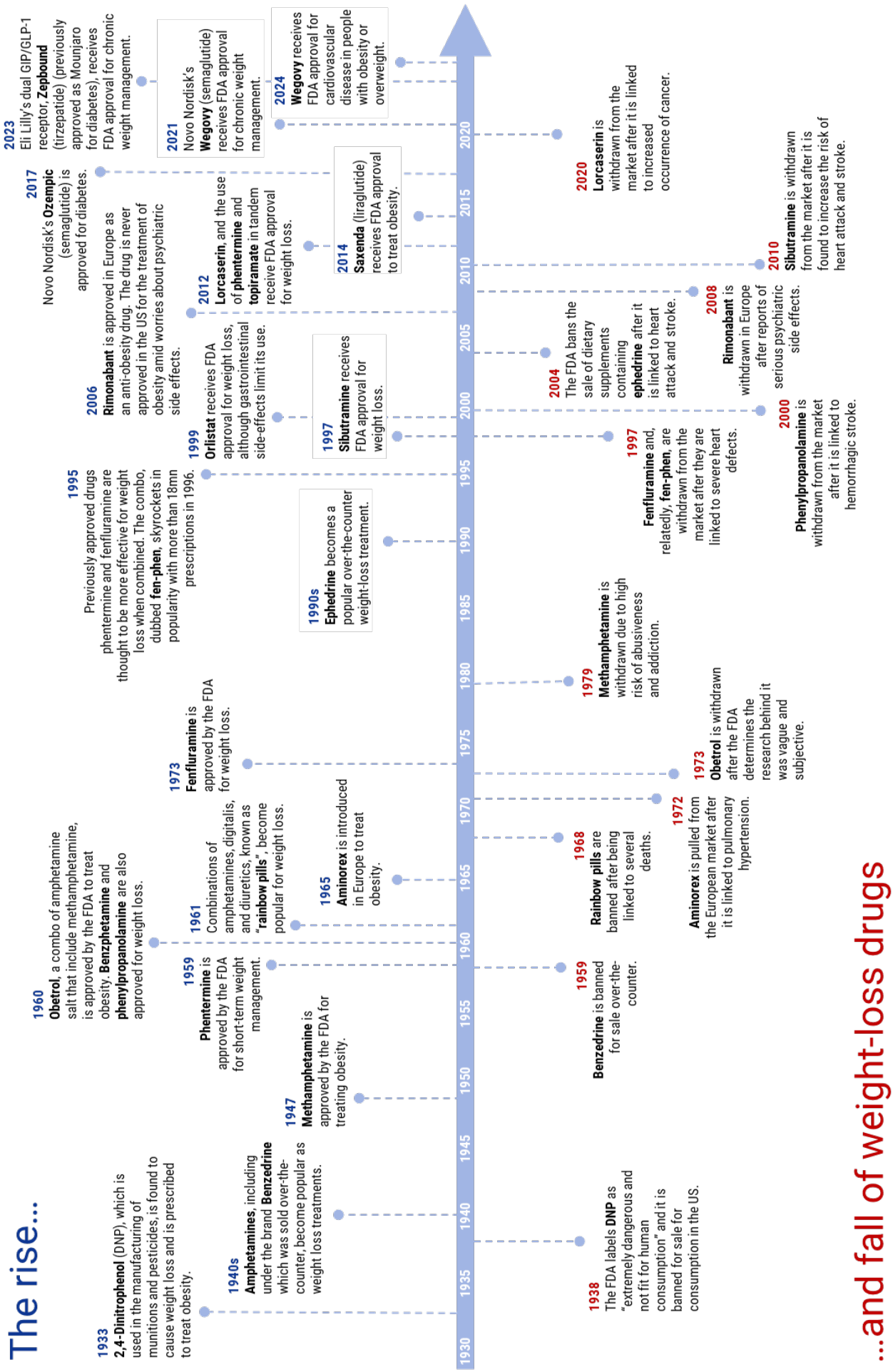
Chris Shibutani: The initial supply shortages are the result of drug companies underestimating demand for GLP-1s. After Wegovy received FDA approval for chronic weight management in June 2021, Novo Nordisk had to actually halt its US launch because the company wasn't prepared to meet demand—patients can't be prescribed treatments that could suddenly become unavailable because that could put them at serious health risk. Drug companies are moving to address this supply shortfall, but ramping up supply is no easy task given the complexity and sophistication of the manufacturing process.

While concocting GLP-1 drugs on their own isn't very difficult, making the "autoinjectors"—pen-like devices that deliver the drugs at adjustable doses so patients can start at a lower dose and titrate upwards—is. It takes 3-4 years for a manufacturing facility to become operational after the decision to commit capital is made. So, even as drug companies have begun to construct the largest-ever drug manufacturing facilities in the world to increase supply, we don't expect supply to catch up to meet demand until later this decade. We assume a more balanced market by 2030, with the introduction of oral GLP-1s—which are much less complex and capital intensive to manufacture—potentially helping to achieve this balance as these drugs are slated to enter the market in 2027/2028.

Jenny Grimberg: Are you concerned that safety will be the same nail in the coffin for GLP-1 drugs as it was for past iterations of weight loss drugs that were ultimately pulled from the market due to significant adverse reactions?

Chris Shibutani: I'm not very worried. Significant side effects became apparent fairly quickly following the introduction of some past weight-loss drugs. For example, it only took a couple years after fen-phen became widely available to recognize that it caused a serious heart defect and a similar timeframe for rimonabant's serious psychiatric side effects to become known. GLP-1s, by contrast, have been used to treat diabetes in the broad population for over a decade, which suggests that the odds of severe adverse reactions that would result in them being withdrawn are quite low. A black swan event is always possible, but GLP-1s' decade-long record of widespread use keeps patients, clinicians, regulators, and pharmacovigilance groups vigilant but comfortable in terms of these drugs' safety.

A long history of weight-loss drugs



Note: This does not constitute an exhaustive list of all weight-loss drug-related developments.
Source: National Institutes of Health; FDA; Li MF, Cheung BM, "Rise and fall of anti-obesity drugs"; NY Times; various news sources; Goldman Sachs GIR.

The GLP-1 craze in pics

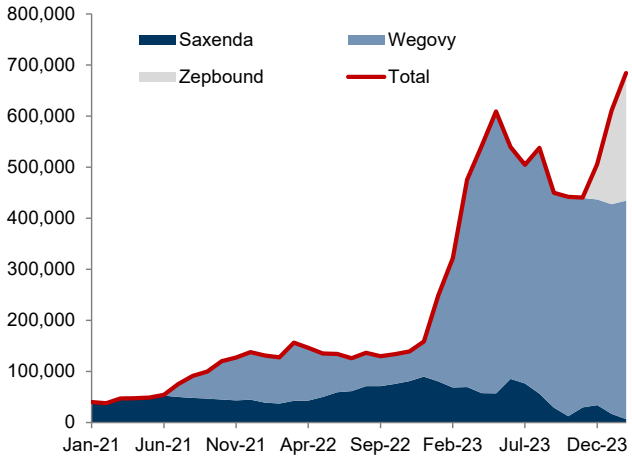
Interest in GLP-1s has surged over the last couple of years…

Google search trends for the term "GLP-1"

Note: Numbers represent search interest relative to the highest point on the chart for the given region and time. 100 represents peak popularity.
Source: Google Trends (https://www.google.com/trends), GS GIR.

…and the number of US adults taking GLP-1s for weight management has risen sharply

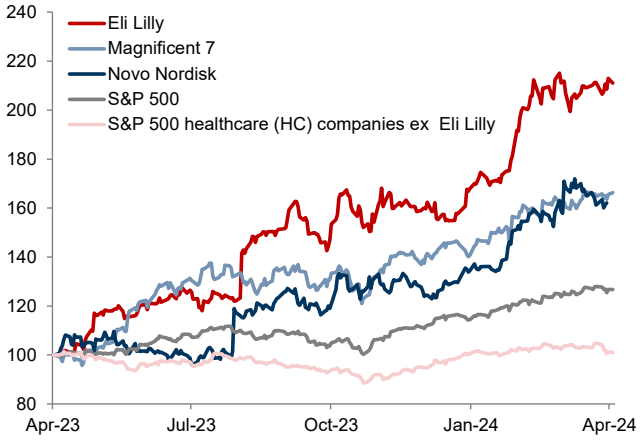
US prescriptions of GLP-1s for chronic weight management



Source: IQVIA, Goldman Sachs GIR.

Eli Lilly and Novo Nordisk's stocks have rallied sharply over the last year alongside the increasing focus on GLP-1s, outperforming the broader S&P 500 index…

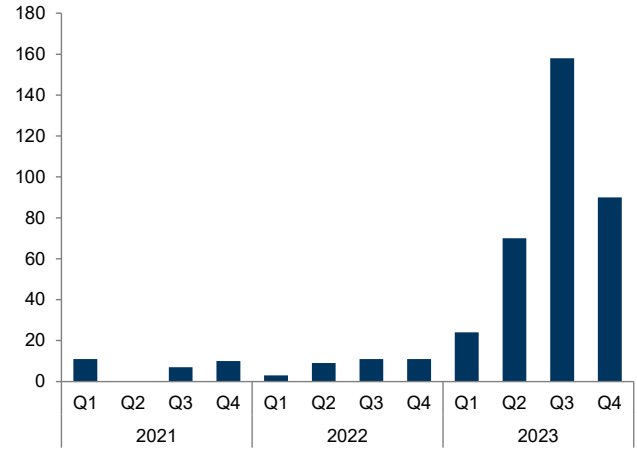
Indexed returns, 12/29/2023=100



Source: FactSet, Goldman Sachs GIR.

…and management teams' mentions of GLP-1s on earnings calls have also spiked, though they are somewhat off their 3Q23 peak

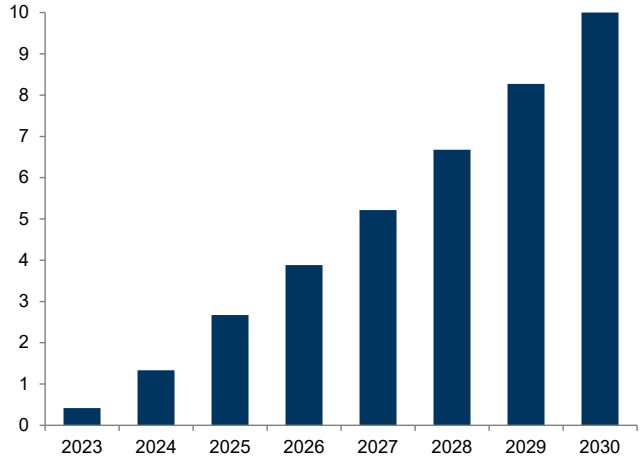
Mentions of GLP-1 on S&P 500 companies' earnings calls



Source: GS Data Works, Refinitiv, Goldman Sachs GIR.

Manufacturing spend on GLP-1 drugs is expected to increase significantly ahead, driven by Eli Lilly and Novo Nordisk…

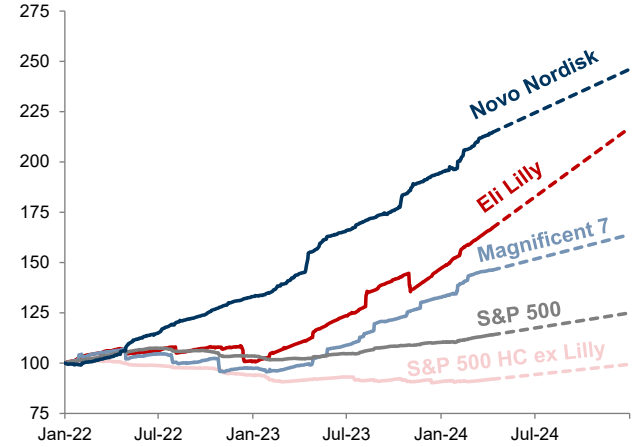
Estimated GLP-1 obesity manufacturing spend by Eli Lilly and Novo Nordisk, $bn



Source: Company data, Goldman Sachs GIR.

…and Lilly and Novo are expected to continue outperforming on an EPS basis

Consensus NTM EPS, Jan 2022=100



Source: FactSet, compiled by Goldman Sachs GIR.

Special thanks to US Healthcare equity analyst Karishma Raghuram for these charts.

The option value of GLP-1s

John Marshall estimates how many people in the US could take GLP-1s depending on the success and failure of the large number of outcomes studies currently in progress

The large number of GLP-1 outcomes studies in progress for the treatment of several diseases beyond obesity suggests the potential for a dramatic increase in the demand for GLP-1s over the coming years. In a scenario in which all of the 23 upcoming studies are successful, we estimate that nearly 70 million people in the US may take GLP-1s in 2028.

While manufacturing capacity, insurance coverage, and patient willingness to take these medicines may remain constraints to wider usage, the upcoming studies will be critical in shaping the opinions of doctors, policymakers, and individuals. As these stakeholders increasingly view GLP-1s as promising treatments for heart disease, kidney disease, obstructive sleep apnea, and other diseases, insurance coverage and use could expand more rapidly than most thought possible just a short while ago.

Sizing the GLP-1s-applicable population

We estimate that over 100 million US adults currently live with conditions approved to be treated with GLP-1 medicines. This includes adults with Type-2 diabetes (T2D), those with a body mass index (BMI) of 30 or greater, and those with a BMI of 27 or greater who have at least one comorbidity. If upcoming studies are successful, we see the number of adults with conditions approved to be treated with GLP-1s potentially growing to 133 million (using current population estimates) by 2028 after accounting for the multiple and potentially overlapping comorbidities individuals who are overweight face.

A 133 million US GLP-1 population

Estimated 2028 US adult population with Type-2 diabetes, overweight, or Alzheimer's conditions

Primary Indication	US Adults (mn)	% adoption	Patients on GLP-1s (mn)
Diagnosed Type 2 Diabetic (regardless of BMI)	40	78%	31
Overweight ex. Type 2 Diabetic (BMI 27+)	55	30%	17
of which Cardiovascular disease	15	83%	12
of which Obstructive Sleep Apnea	11	37%	4
of which Chronic Kidney Disease	3	0%	0
of which Non-alcoholic Steatohepatitis	4	52%	2
of which Knee Osteoarthritis	2	32%	1
of which Peripheral Arterial Disease	2	0%	0
of which Heart Failure w/ PEF	1	55%	1
Alzheimers	7	15%	1
Total population analyzed	**133**	52%	**68**

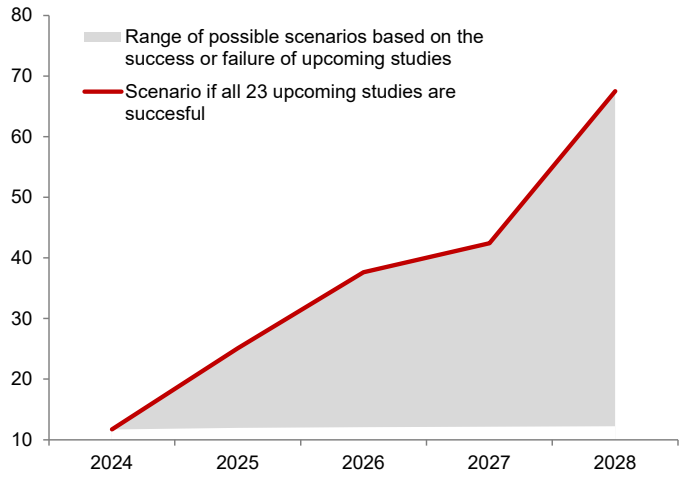
Source: NIH, Goldman Sachs GIR.

32,768 possible scenarios; nearly 70 million people using GLP-1s in the most successful one

For each of the upcoming 15 study groups (we group the 23 studies by disease/indication and year of availability/coverage), we estimate how much a successful result will affect four factors: (1) percentage of each indication population the FDA approval covers, (2) percentage of corporate plans that will offer coverage for each indication, (3) likelihood Medicare/Medicaid will offer coverage for that indication, and (4) estimated increase in the willingness of individuals to choose GLP-1 treatment. After estimating the potential expansion associated with the success or failure of each individual study, we estimate the population that is likely to seek treatment with GLP-1-based medicines in each of the combinations of success/failure across the 15 study groups. This analysis yields 32,768 possible scenarios, with the most successful scenario—success across all of the study groups—resulting in nearly 70 million patients on GLP-1s in 2028.

Nearly 70 million people in the US could take GLP-1s in 2028

Estimated number of US individuals treated with GLP-1s in scenarios based on success/failure of upcoming studies, millions of people



Source: Goldman Sachs GIR.

Expanding awareness, expanding usage

These scenarios focus on estimating the impact of upcoming studies on the trajectory of GLP-1 demand in the US. While pricing strategies, timing of new supply, and competitive dynamics will affect the overall delivery of GLP-1s to patients, this analysis provides a sense of the overall access and total revenue that may be spent on these treatments if companies manufacture enough to meet demand. While many of these study results may not be a gating factor for access to GLP-1s, they have the potential to significantly expand awareness among patients and doctors, which would likely eventually lead to expanded usage.

John Marshall, Head of Derivatives Research

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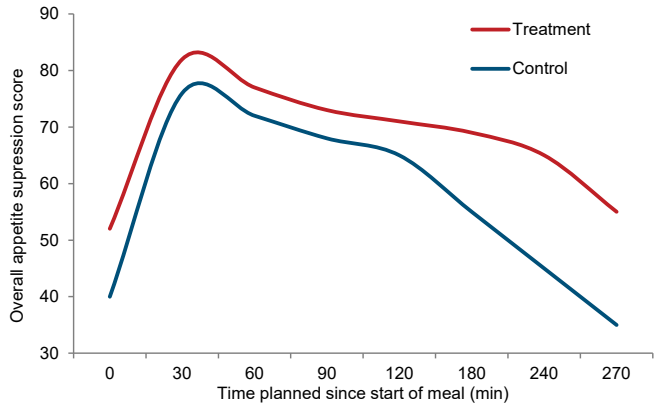
Tel: 212-902-6848

How do GLP-1s impact consumption?

A Novo Nordisk-funded study found that 12 weeks of GLP-1 treatment resulted in reduced appetite and less food cravings…

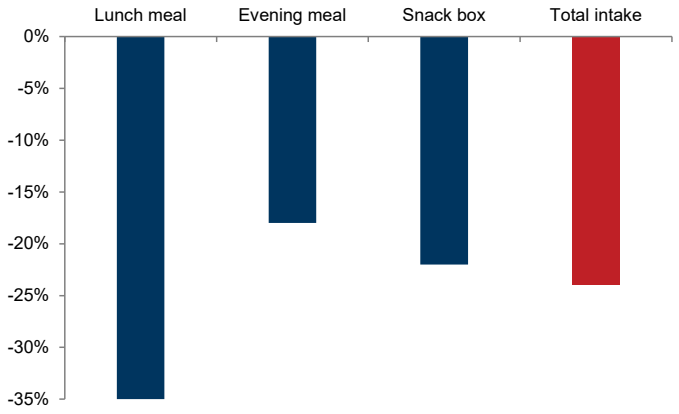
Time planned since start of meal (min, x-axis) vs. overall appetite suppression score* during breakfast (y-axis)



*Score calculated based on four appetite parameters: satiety, fullness, hunger, and prospective food consumption. Higher score indicates less appetite.
Source: Blundell J, Finlayson G, Axelsen M, et al. Effects of once-weekly semaglutide on appetite, energy intake, control of eating, food preference, and body weight in subjects with obesity. Diabetes, Obesity and Metabolism.

…leading to a nearly 25% decline in overall energy intake, equivalent to around 725 calories/day…

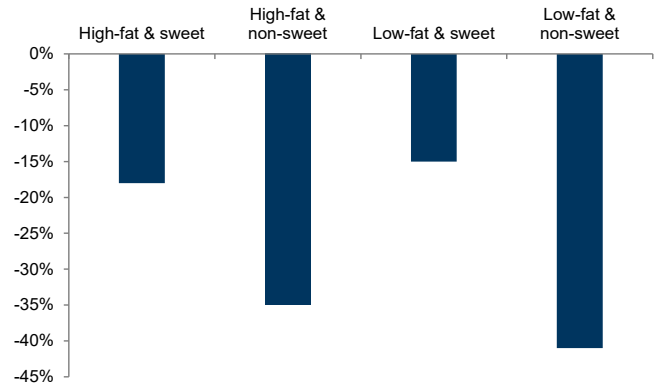
Change in energy intake, %



Source: Blundell J, Finlayson G, Axelsen M, et al. Effects of once-weekly semaglutide on appetite, energy intake, control of eating, food preference, and body weight in subjects with obesity. Diabetes, Obesity and Metabolism.

…with patients reducing their snacking, particularly when it came to low-fat and non-sweet foods*

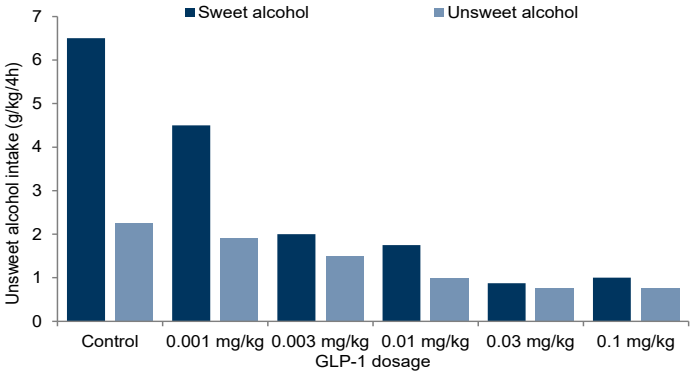
Change in snacking energy intake by food group, %



*High-fat & non-sweet was the only statistically significant result.
Source: Blundell J, Finlayson G, Axelsen M, et al. Effects of once-weekly semaglutide on appetite, energy intake, control of eating, food preference, and body weight in subjects with obesity. Diabetes, Obesity and Metabolism.

An investigator-led pre-clinical study found that sweet and unsweet alcohol intake in mice declined with increasing doses of GLP-1…

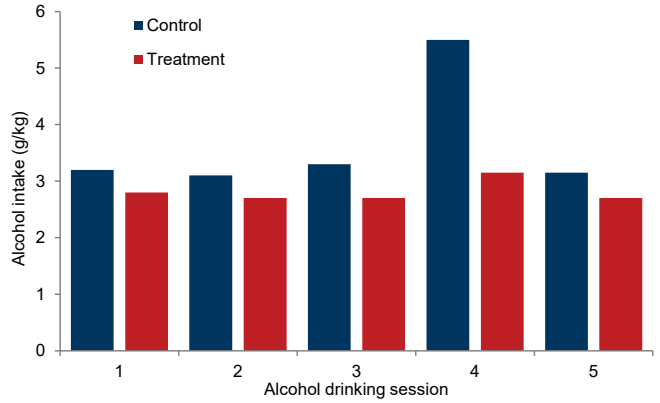
GLP-1 dose (mg/kg, x-axis) vs. sweet and unsweet alcohol intake (g/kg/4h, y-axis)



Source: Choung, V., Farokhnia, M., Khom, S., Pince, C. L., Elvig, S. K., Vlkolinsky, R., Marchette, R. C., Koob, G. F., Steinman, M. Q., Vendruscolo, L. F., & Leggio, L. The glucagon-like peptide-1 (GLP-1) analogue semaglutide reduces alcohol drinking and modulates central GABA neurotransmission. JCI Insight.

…with another study that found that GLP-1 treatment reduced alcohol consumption in rats consistent with these results

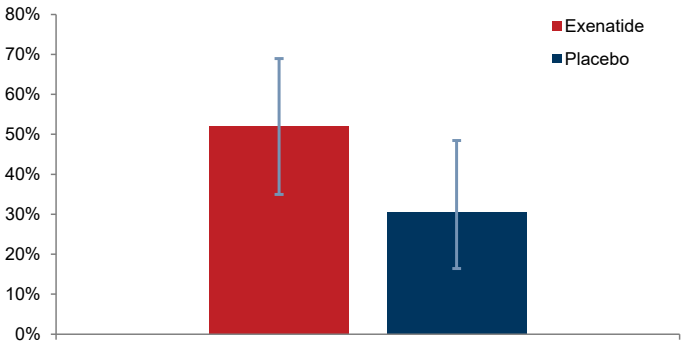
Alcohol intake during five drinking sessions, g/kg



Source: Aranas, Edvardsson, Shevchouk, Zhang, Witley, Skoldheden et al. Semaglutide reduces alcohol intake and relapse-like drinking in male and female rats. The Lancet.

A randomized controlled investigator-led clinical trial found that GLP-1 treatment (exenatide) also improved smoking abstinence

Abstinence rates on exenatide vs. placebo, %



Note: Exenatide tested in conjunction with a nicotine patch vs. nicotine patch alone.
Source: Yammine, L., Green, C. E., Kosten, T. R., De Dios, C., Suchting, R., Lane, S. D., Verrico, C. D., & Schmitz, J. M. Exenatide adjunct to nicotine patch facilitates smoking cessation and may reduce Post-Cessation weight gain: a pilot randomized controlled trial. Nicotine & Tobacco Research.

Special thanks to GS GIR equity analysts Olivier Nicolai, Aron Adamski, Srikar Medisetti, and Tom Hulls from the European Consumer Staples team for these charts, which were originally published in an October 26, 2023 Consumer Staples note.

Interview with Jonathan Gruber

Dr. Jonathan Gruber is the Ford Professor of Economics and the Chairman of the Economics Department at MIT. He was a key architect of Massachusetts' 2006 health reform and helped craft the Obama Administration's Patient Protection and Affordable Care Act. Below, he argues that significantly broadening access to GLP-1 drugs would cost the US government a staggering sum, and, to address this problem, US policymakers must regulate drug prices.

The views stated herein are those of the interviewee and do not necessarily reflect those of Goldman Sachs.

Allison Nathan: How equipped is the US healthcare system to grapple with the rising popularity of GLP-1 drugs, which are extraordinarily expensive today?

Jonathan Gruber: The US healthcare system is not well equipped to deal with these developments. Over 40% of Americans meet the criteria for obesity today, and healthcare expenses for obesity and obesity-related illnesses total around $210 billion annually, with those figures expected to grow. So, we desperately need game-changing treatments for obesity, and GLP-1 drugs have shown tremendous promise in this regard.

The problem is that these drugs are very expensive in the US, and current evidence suggests users will need to take them indefinitely to maintain their weight loss. Right now, Medicaid spends only around $3 billion on these treatments because federal government health insurance plans generally only cover them for the treatment of Type-2 diabetes. Broadening the availability of these drugs to include the treatment of obesity would undoubtedly generate a host of health benefits, including the reduction of obesity itself as well as related—and often fatal—conditions like heart failure and stroke.

But the associated cost would be exorbitant. I, together with Brian Deese and Ryan Cummings, estimate that the cost to state public insurance programs, health insurance exchange subsidies, and US taxpayers if 40% of all Americans with obesity took these drugs at current prices—roughly $15,000 per year per person—would total over $1 trillion annually. That would exceed the cost savings to the government from reduced diabetes incidence and other obesity-related conditions by a whopping $800 billion annually. That is almost as much as the government spends on the entire Medicare program and almost one-fifth of the entire amount America spends on healthcare. So, it's a staggering figure.

Allison Nathan: But is that a realistic calculation given that many Americans with obesity won't be well-suited for these drugs and/or may choose not to take them even if they are?

Jonathan Gruber: These types of calculations are always uncertain, but they're important to perform to give people a sense of the order of magnitude of the problem. If every American with obesity becomes eligible to take GLP-1s, it's clearly uncertain how many would actually take it. We assume 40% of those who are eligible would do so, which may seem like a large number, but Americans that don't have obesity but meet the criteria for being overweight comprise another 30% of the population, and they may also want to take GLP-1s. So, our estimates of the number of people who would take these drugs if they become eligible could end up being conservative.

Allison Nathan: Even if you are underestimating how many people would ultimately be willing and able to take GLP-1s, won't the high price of them today motivate competitors to enter the market and bring the price down?

Jonathan Gruber: That is a valid criticism of our estimates and the largest pushback we've received about them. My response is that I sure hope that happens! But the problem is that in the current patent system in which companies often employ lawsuits and other tools to extend the life of their patents, competition is slow to work as a price-lowering mechanism. And, in the meantime, people who could benefit from these drugs aren't able to access them because insurers are so afraid of the costs that they are excessively restricting access.

Allison Nathan: So, what actions should policymakers take to address this problem?

Jonathan Gruber: The US must recognize what every other developed country in the world has realized: a purely free market in healthcare does not work. I am strongly in favor of free markets when they work; the government should not regulate the price of apples or cars because ample information and competition ensures sufficient price discovery in these areas. But information and competition in healthcare are imperfect. When someone is experiencing a heart attack, they can't ask the ambulance driver to take them to another hospital to see if it is cheaper. And many places only have one nearby hospital, so the hospital can charge whatever it wants. For these reasons, healthcare in the US does not benefit from the same kind of market forces that allow other markets to function so well. That doesn't mean no role exists for markets in healthcare, but rather that they will work best within the strictures of more government intervention. Every other developed market country long ago came to that conclusion and now regulates both the price and the use of drugs like GLP-1s, and the US should as well.

Allison Nathan: What would this look like in practice?

Jonathan Gruber: A government organization would be in charge of adjudicating two issues: who should be eligible for insurance coverage of these drugs, and what the price of the drugs should be. And the price should not be based on what the market can bear but rather on the social value of the drugs. That's a tough number to calculate. The Institute for Comparative Effectiveness Research, a nonprofit organization that performs such calculations, has found that GLP-1s are worth around $7,000 annually for the people who would benefit

the most from these drugs, though that doesn't take into account the broader population that could benefit.

A good starting point when trying to discern the social value of a drug is recognizing that all medical treatments have two primary effects—they can lengthen life spans and can improve quality of life. Economists can estimate the value of a year of life by noting how much people need to be paid to take risks or will pay to protect themselves from death. The harder part is estimating the value of, say, losing 25 lbs or of not having diabetes, which economists typically get a sense of through surveys that ask people what these things would be worth to them. This is admittedly not an exact science, but it is a more rational way of pricing drugs than just pricing them at whatever cost the broken market will bear.

Allison Nathan: But supply of these drugs isn't even enough to meet today's constrained demand, let alone the potentially much higher demand if the price declines. Won't setting prices lower just worsen the supply issue?

Jonathan Gruber: Prices shouldn't be set so low that they choke off supply. But the marginal cost of producing GLP-1 drugs is very low. Drug companies don't need anywhere close to $15,000/person/year to be motivated to produce more units. Supply is low because the GLP-1 manufacturing process is complicated and drug companies didn't anticipate the current level of demand. But price isn't—and likely won't be—the problem when it comes to supply.

Allison Nathan: Even if prices remain high enough to more than cover the marginal cost of production, what about drug innovation more broadly? Won't setting lower prices reduce the incentives for companies to develop drugs, which is an enormously expensive process?

Jonathan Gruber: Arguments that the government regulating drug prices would kill innovation are misplaced because government dollars that go to private sector drug companies ultimately squeeze out public sector healthcare spending. Every drug invented in the US is based on basic science paid for by the US government through the National Institutes of Health (NIH). If the government spends hundreds of billions of dollars to cover GLP-1s at their current prices for people with obesity, government spending on research and development (R&D) would undoubtedly be cut, which would reduce innovation.

I, together with Rena Conti and Richard Frank, have found that taking a dollar from government spending on drugs and giving it to the NIH does much more for drug innovation than leaving that dollar in the hands of the drug companies, because public NIH research benefits everybody, while private research just benefits the drug company. In my book with Simon Johnson, Jump-Starting America, we make the point that private R&D is important, but public R&D is just as important, if not more so, for this very reason. But US spending on public science has dwindled from 2% of GDP in the 1960s to less than 0.6% of GDP today, leaving the US 14th in the world in public R&D. The bottom line is that drug prices should not be set low enough to drive drug company profits to zero or even as low as they are in Europe, but they also should not inhibit the government's ability to perform the basic science that benefits everyone. Prices can be set at a level that provides strong incentives for private innovation without jeopardizing public spending and US fiscal health.

Allison Nathan: If GLP-1s are so beneficial to so many Americans, couldn't we just raise taxes to pay for them rather than add to the US' fiscal burden?

Jonathan Gruber: Theoretically, yes, especially when we recognize that the US is an incredibly low-tax nation. The US income tax burden relative to GDP is only the 14th highest in the developed world. If taxes were raised to pay for the entire $800 billion that broad access to GLP-1s would cost the government, that would move the US to 12th place from 14th. So, that would be a relatively small move, but undoubtedly quite challenging, if not impossible, to pull off politically.

Allison Nathan: Wouldn't Americans end up on the hook anyway as employers pass the cost of insuring these drugs onto employees?

Jonathan Gruber: To some extent. Studies that I and others have done suggest that the enormous cost to employers if GLP-1s become more available would ultimately be passed onto employees. As the cost of health insurance and premiums rise, employers don't necessarily fire people; they just pay workers less. The government would still bear some cost, though, because wages are taxed but employer health insurance is not. So, if your employer pays you less in wages and spends more on your health insurance, that would lower government tax revenues. But the biggest implication would be people earning less because insurance premiums would rise.

Allison Nathan: As politically unpalatable as raising taxes is, doesn't the long history of failed drug regulation bills suggest this solution also isn't politically feasible?

Jonathan Gruber: A few years ago, I would've probably said yes, but the Inflation Reduction Act (IRA) that Congress passed in 2022 has made me more optimistic about the prospect of drug price regulation in the US. For the first time in US history, Medicare was granted the authority to negotiate drug prices. But this authority is currently limited to only 10 drugs—and excludes GLP-1s—and requires the drugs to have been on the market for at least seven years, which means GLP-1s would only become eligible for negotiation later this decade, at the earliest. So, more needs to be done to expand this authority to other drugs and to do so more quickly.

But the IRA framework is a step in the right direction to begin tackling these issues, as is pursuing other innovative solutions, such as Nobel laureate Michael Kremer's idea of creating prize-based incentives to motivate drug innovation and solve diseases. This concept worked for the pneumococcal vaccine, which was developed with a prize set up by the Gates Foundation and then offered at marginal cost to the population. None of this is to say that this won't be an incredibly hard battle and the politics aren't challenging, but the US has successfully tackled bigger challenges in the past, and now it's time for it to tackle this one.

GLP-1s: scales tip in favor of coverage

Nathan Rich expects coverage for anti-obesity drugs to expand amid favorable health outcomes and rising consumer demand, though price remains a gating factor

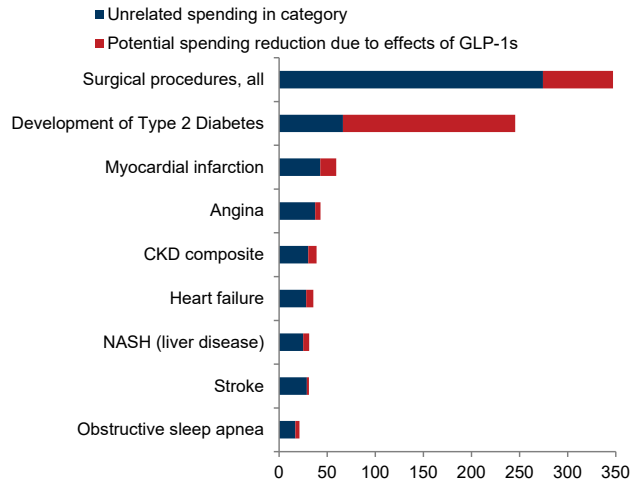
Anti-obesity drugs, particularly GLP-1s, could significantly reshape US healthcare spending. The massive patient population that could benefit from these drugs and steep price tag (Novo Nordisk's Wegovy currently lists at ~$1,350/month in the US) have mostly kept payors and employers on the sidelines so far. The high costs, together with questions around patient compliance and an uncertain ROI, present challenges to achieving widespread coverage for GLP-1s in the commercial insurance market. Access to these drugs is gradually expanding, with up to half of employers providing some coverage in 2024 according to commentary from insurance companies. And rising employee demand and the potential productivity benefits associated with GLP-1 use could lead to further coverage expansion. That said, ubiquitous coverage will require a tidal moment such as 'weight loss' being deemed an essential health benefit under the Affordable Care Act (ACA) or broad Medicare adoption—which is currently prohibited by law, but may be more likely following FDA approval of Wegovy to reduce cardiovascular (CV) risk.

Significant savings for the healthcare system

The potential spending on GLP-1 drugs (our Pharma team estimates ~$85bn in US sales in 2030, see pgs. 6-7) will likely depend on the cost savings realized by corporate and government payors. Over 20 clinical trials investigating the impacts of anti-obesity drugs on CV disease, diabetes, sleep apnea, and non-alcoholic steatohepatitis (NASH) will be completed and made public by 2027. Health spending in these categories currently totals ~$850bn annually, and the risk reduction observed in the trials imply a significant reduction in health care spending of ~$300bn, or 35%. The majority (~60%) of savings come from reducing the risk of developing Type-2 diabetes (T2D), which represents 95% of all diabetes spend, with recent studies showing that GLP-1 use could result in a 73% decline in the likelihood of developing T2D.

GLP-1 drugs could reduce health spending by ~$300bn annually

Annual healthcare spending across categories in GLP-1 related studies, $bn



Source: MEPS, NHE, Goldman Sachs GIR.

Employers' coverage conundrum: price is key

Many employers remain hesitant to cover anti-obesity drugs given significant near-term costs, the relatively short average tenure of employees (5-7 years), and uncertainty around patient compliance and the magnitude of future cost avoidance. For long-term diseases like T2D or CV, the health benefits may not be realized by a patient's current employer. Coverage decisions have thus far been made employer-by-employer, and UnitedHealth Group (UNH) has noted that less than 20% of its Administrative Services Only (ASO) clients (companies that fund their own employee benefit plans but hire others to administer it) covered GLP-1s in 2023. Employers are hyper-focused on controlling utilization through prerequisite participation in a weight loss program, stringent prior authorizations, specified weight loss targets while on the therapies, and attestation of diet/exercise changes.

Price is the key barrier for employers considering covering GLP-1 drugs. UNH's public stance suggests that current prices will have to decline meaningfully for coverage to expand, with it referencing a significantly lower price in Europe relative to the US (~$1,350/month list price for Wegovy in the US vs. $190-$330/month in Europe). The most effective tool to reduce price is competition, and competitors entering the market should give pharmacy benefit managers (PBMs) greater leverage to negotiate prices down to a level acceptable to payors.

Early evidence of this has already emerged. Cigna's Express Scripts PBM introduced a financial guarantee through its EncircleRx program for employers that want to cover GLP-1 drugs but are concerned about cost. For a fee, its clients will receive a cost trend cap that limits GLP-1 spending growth to a specified threshold (e.g. <15%). Cigna struck unique contracts with Lilly and Novo to enable this, and will strictly manage utilization and require participation in a lifestyle modification program to achieve favorable outcomes and control costs.

What could catalyze broader coverage?

For now, commercial coverage will remain an employer-led decision, though greater demand from employees and potential productivity benefits from GLP-1 use could drive coverage expansion. Seniors are another patient population that could meaningfully benefit from improved health outcomes. Medicare is currently prohibited by law from covering drugs for weight loss. The Treat and Reduce Obesity Act (TROA), reintroduced in Congress last July, aims to overturn this prohibition and open the door to Medicare coverage. We expect growing political support for coverage, though the Congressional Budget Office score of the bill could impact the degree of support. On March 21, the Centers for Medicare & Medicaid Services (CMS) announced that Medicare Part D (the part of Medicare that provides prescription drug coverage) could cover Wegovy for use in patients who meet the criteria for obese/overweight and also have CV disease. As outcomes trials demonstrate long-term health benefits and approved indications for this class expands, further actions like this could broaden access to GLP-1s without the need for Congressional action.

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Raising Medicare costs, delaying reform

Alec Phillips argues that expanding Medicare coverage for GLP-1s could sharply raise costs, but other compelling reasons may lead policymakers to do so anyway

When Congress passed the Medicare drug benefit (Part D) in 2003, it prohibited coverage of weight loss medications. However, when approved for other indications beyond weight loss, they may be covered for those other uses. This has come into play following FDA approval of Wegovy to reduce the risk of cardiovascular (CV) problems in patients who have an established CV disease and meet the criteria for obesity/overweight. In response, Medicare has expanded coverage to this indication, though drug plans may use strategies to manage GLP-1 use. To the extent that the FDA approves GLP-1s for further indications, Medicare coverage would likely follow.

However, in light of the statutory prohibition, Medicare cannot cover GLP-1s for weight loss alone. Pending legislation would change this. The Treat and Reduce Obesity Act (TROA) would allow Part D plans to cover weight loss drugs for beneficiaries who meet the criteria for obesity/overweight and have related comorbidities. Under the TROA, roughly 55% of the Medicare population—or 29 million people—could be eligible for GLP-1s.

The costs outweigh the benefits…

Proponents of expanding Medicare coverage for GLP-1 drugs argue that doing so would provide substantial net value to society as well as reduce Medicare spending. While the broad benefits of GLP-1s seem clear, the benefits to Medicare spending are not. The impact depends mainly on how the price Medicare pays for GLP-1s compares with the associated reduction in non-drug spending. If around half of Medicare Part D enrollees—i.e., all those potentially eligible—use GLP-1s, total Medicare drug spending could triple. The Congressional Budget Office (CBO) projects *total* Medicare Part D spending of $120bn this year. At a list price of $1,350/month and assuming a 30% rebate, the per-beneficiary annual cost would be ~$11,300/year for semaglutide. So, the cost of Wegovy for 55% of the Medicare population, after cost-sharing and premium increases, would be twice as much as total Medicare drug spending.

That said, the share taking these drugs would likely be far smaller. For example, only 21% of the Medicare population has an identifiable diagnosis of obesity in Medicare claims. And not all eligible patients would take the drugs: a large-scale study of VA patients with heart disease and diabetes found that only 8% received a GLP-1. Uptake by 21% of patients would raise spending by ~$90bn after cost-sharing and premiums; uptake by 8% of the 55% potentially eligible Medicare patients would raise spending by ~$18bn.

Improved health outcomes would likely reduce spending on medical care. However, these gains seem unlikely to come anywhere close to offsetting the cost of the drugs. A recent study of semaglutide suggests a discounted lifetime cost of $274k with lifetime non-drug savings (e.g., fewer hospital admissions and physician visits) of $62k. Semaglutide will likely become eligible for Medicare price negotiation by 2027, lowering the lifetime cost but still leaving it well in excess of estimated non-drug savings. Improved health outcomes would also take time to lead to lower non-drug health costs, so the near-term trade-off for health financing would be more adverse than these studies suggest. The marginal savings would also likely decline as the covered population expands. Medicare now covers, albeit with restrictions, semaglutide and other AOMs for patients with CV disease. Broadening coverage to those without it would likely still reduce non-drug spending but to a lesser degree than among those recently covered.

…and are unevenly distributed

The distribution of the costs and benefits would also be uneven. The share of Medicare enrollees hitting extremely high spending levels would rise substantially. In 2022, 4.3 million (8%) reached the "catastrophic" coverage phase of the Medicare drug benefit, after which the patient pays only 5% of the cost of drugs. The annual cost of Wegovy alone would push each patient taking it into this spending category. And the structure of the Medicare benefit is also set to change. Under the Inflation Reduction Act, from 2025 on Medicare will have a $2,000 annual out-of-pocket limit on drug spending with no cost-sharing over that amount, reducing the cost sensitivity of patients to high-priced drugs and shifting the costs elsewhere in the healthcare system. Part D is 74% financed by taxpayers, 15% through monthly premiums paid by enrollees, and 11% by states, so enrollees via higher premiums and taxpayers more generally would bear most of the increased cost.

Solving solvency…on paper only and at reform's expense

Counterintuitively, while expanded GLP-1 coverage would substantially increase overall Medicare spending, it could actually improve Medicare "solvency" in federal budgetary terms. The Medicare trust fund collects payroll taxes and pays out benefits under the Hospital Insurance program, also known as Part A. The trust fund is projected to exhaust its resources late this decade or by the middle of the next decade. If this occurs, benefits would be cut to the amount of revenue coming in. Congress would likely step in before this occurs, creating a catalyst for reform. However, the hospital benefits the trust fund finances would become slightly less costly in the event of broad GLP-1 uptake. At the same time, other parts of the program that do not rely on trust fund financing would bear the costs of broader GLP-1 coverage. This means that some of the savings but none of the costs would accrue to the Medicare trust fund, delaying the only obvious catalyst for Medicare reform over the next several years.

Compelling non-financial reasons to expand coverage

These are not necessarily arguments against expanding coverage. Until 2006, Medicare did not cover prescription drugs at all. Congress expanded coverage for the benefit of seniors with the understanding that it would increase spending. Similarly, there are non-financial arguments for expanding coverage to GLP-1s, and legislation to do so has growing bipartisan support. However, while there might be good reasons for policymakers to take this step, producing overall savings for the Medicare program is unlikely to be one of them.

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GLP-1s' significant economic potential

Joseph Briggs argues that GLP-1 drugs and other recent healthcare innovations could lead to significant improvements in health outcomes that could have meaningfully positive impacts on the US economy

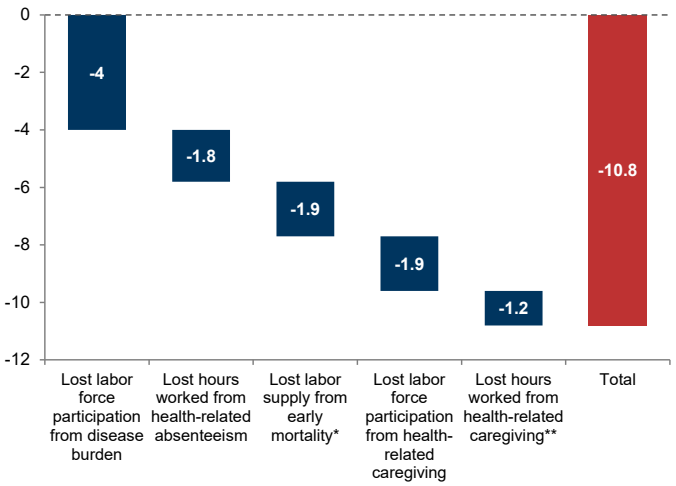
GLP-1 drugs have the potential to drive significant improvements in health outcomes and enable people to live better and longer lives. While these improvements will undoubtedly be extremely valuable for the individuals that benefit from taking them, they may also generate positive economic spillovers. Although the magnitude and timing of any economic boost is uncertain, we estimate that GLP-1 medications could raise the level of US GDP by 0.4% under reasonable adoption assumptions, with other health innovations such as the emergence of AI-powered drug discovery, gene and cell therapy, and better diagnostics for diseases like Alzheimer's potentially raising GDP by an additional 0.9%.

Poor health imposes significant economic costs...

Poor health imposes meaningful economic costs on society, primarily by limiting labor supply. Labor force participation rates are considerably lower for individuals that report having "fair" or "poor" health relative to those that report having "good", "very good", or "excellent" health. Short-term illnesses and chronic health conditions reduce the number of days and hours that individuals in the labor force are able to work, with an estimated 2% of US workdays currently lost for health-related reasons. Early mortality also lowers working population growth, with early deaths due to health conditions subtracting an estimated 0.2pp from annual labor supply growth. And informal caregiving for sick individuals weighs heavily on both labor force participation and hours worked for caregivers, with health-related caregiving subtracting roughly 3% from total labor supply. Taken together, we estimate that poor health lowers the level of US GDP by over 10%.

Poor health subtracts over 10% from US GDP

Estimated effect of poor health on US GDP, %

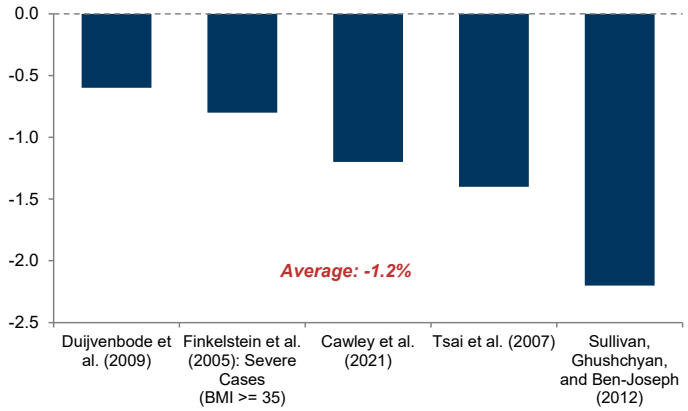


**Estimated drag on annual labor supply growth times an average of eight working years lost. **Assuming three caregiving hours on average are reinvested into work by employed caregivers, based on Lilly et al. (2007).*
Source: Goldman Sachs GIR.

When it comes to obesity specifically, academic studies find that individuals with obesity are both less likely to work and less productive when they do, with study averages implying a 1.2% hit to labor supply and 1.9% hit to productivity. These estimates suggest that obesity-related health complications subtract over 3% from per capita output, which, when combined with the 40% incidence of obesity in the US population, implies an over 1% hit to total output.

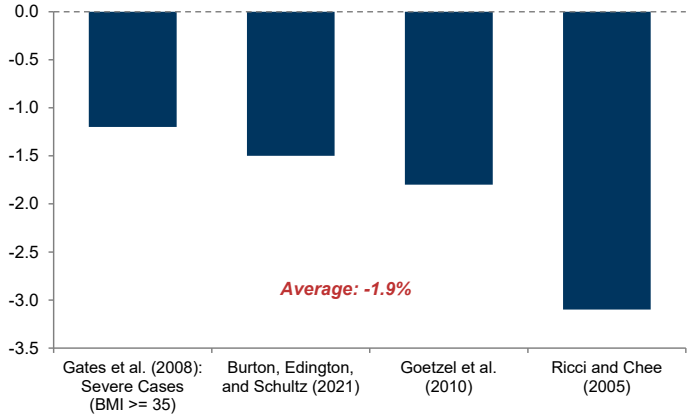
Obesity-related health complications weigh on labor supply...

Estimated effect of obesity-related health complications in the US on labor supply, % of output



...and productivity, subtracting over 3% from per-capita output

Estimated effect of obesity-related health complications in the US on productivity, % of output



Source: Goldman Sachs GIR.

...which the widespread adoption of GLP-1s could lower

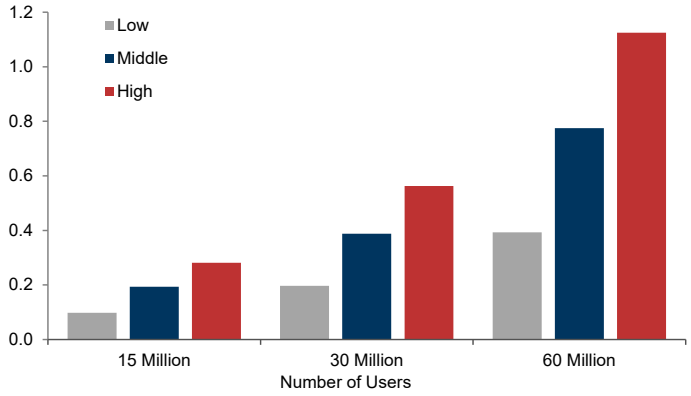
Although poor health and its associated economic costs will never be fully eliminated, the widespread use of GLP-1s could lower these costs. While these drugs are currently very expensive and insurance coverage for them is still limited, many individuals with obesity have comorbidities that could become eligible for GLP-1 treatment and reimbursement if upcoming clinical trials and regulatory approvals are successful. Our derivatives research team envisions a plausible upside case in which nearly 70 million Americans could be on GLP-1 drugs in 2028 (see pg. 10).

If GLP-1 usage ultimately reaches anywhere close to this figure and correspondingly lowers the prevalence of obesity, that could have significant impacts for the broader economy. To estimate the potential impact, we combine several plausible GLP-1 use scenarios with our estimates of potential output

increases, allowing for some additional uncertainty around the effectiveness of GLP-1 drugs in reducing weight and raising productivity. We find that GLP-1 medications could raise the level of US GDP by 0.4% in a baseline scenario where 30 million users take the drugs and 70% lose weight, with the GDP effects ranging from negligible to over 1% in plausible downside and upside scenarios.

GLP-1 medications could raise US GDP by 0.4% in a baseline scenario, and by over 1% in a plausible upside case

Upside to US GDP from GLP-1 medications by number of users and effectiveness scenario*, %



*Low=50% of users benefit from labor supply/productivity effects, which is at the 25th percentile of academic estimates. Middle=70% of users benefit at 50th percentile. High=90% of users benefit at 75th percentile.
Source: Goldman Sachs GIR.

The rising popularity of GLP-1 drugs and healthcare innovation more broadly should also translate into output increases in other economies beyond the US, though we expect the effects from the current wave of health progress to be larger in the US than elsewhere, for three reasons. First, the US has relatively more to gain from the widespread adoption of GLP-1 drugs than other economies given its higher rates of obesity and generally worse health outcomes, although China has the largest number of people with obesity in the world and therefore looks poised to majorly benefit from GLP-1 drugs. Second, the US will likely outpace other economies in its rate of innovation and adoption of new health treatments. Indeed, historical patterns suggest that over half of all new drugs are first launched in the US, with an average delay of one year before launch in other major markets. And third, while the scope for health improvements in EM economies is significant, near-term health advances in these economies will likely stem from high-impact investments in relatively inexpensive existing therapies rather than cutting edge research and development.

Other innovations could further lower economic costs

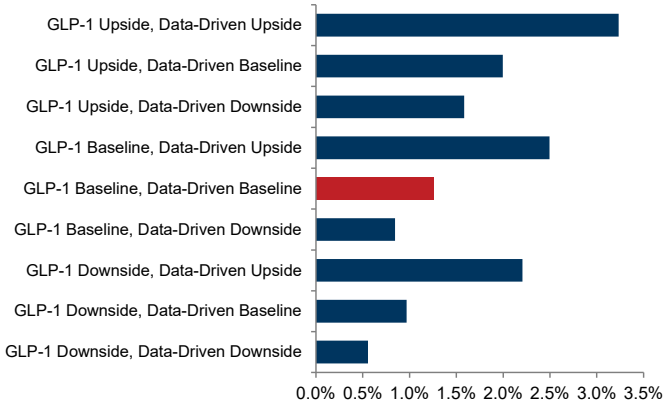
Advances in computational biology, the advent of big data in healthcare, and a greater understanding of human genomics (via the Human Genome Project and a lower cost of sequencing) could also accelerate health innovations that generate economic benefits. Although it is highly uncertain if and when individual therapies will cross specific regulatory, cost, and adoption thresholds, innovation in these areas could accelerate the pace of health progress.

Major economies have experienced a reduction in disease burden—as measured in disability-adjusted life years (DALYs)—of roughly 10% every 10 years, although progress in the US has stagnated since 2010. If new data-driven therapies drive an acceleration in the rate of US health progress back to the pre-2010 pace, the macroeconomic impact could be sizable. We find that such an acceleration would likely boost US GDP by just under 1%, with the effects ranging from 0.5-2.5% of GDP under different plausible assumptions.

Combining this with our baseline estimate of the impact from GLP-1 drugs (rescaled to non-obesity conditions to avoid double counting) suggests that ongoing healthcare innovations could raise the level of US GDP by 1.3% in the coming years (equivalent to $360bn annually in today's dollars), with plausible effects ranging from 0.6-3.2%.

Ongoing healthcare innovations could raise US GDP by 0.6-3.2%

Upside to US GDP from pending healthcare innovations: scenario analysis



Source: Goldman Sachs GIR.

An important macro story, with some caveats

Taken together, we view the rising popularity of GLP-1 drugs and the broader wave of healthcare innovation as a promising human, micro, and macro story that could drive meaningful economic upside across a range of likely scenarios. That said, several caveats to our estimates are worth keeping in mind.

First, our analysis assumes that individuals who experience health improvements will increase labor supply to match their healthier peers. If instead individuals leverage health improvements to increase their leisure, then our estimates would overstate the output increase.

Second, we assume that health improvements mostly reduce caregiving demands, but it is also possible that caregiving needs increase if health innovations extend longevity more than they improve health status. Third, nominal spending on health treatments could either increase (reflecting more spending on new treatments) or decrease (reflecting lower spending on existing therapies) in response to medical improvements, thereby leaving the effects on consumption ambiguous.

Finally—and most importantly—our estimates of the effects on measured economic output do not necessarily capture the value individuals place on improvements in their health, longevity, and wellbeing from new treatments. Our estimates therefore likely significantly understate the welfare value of the health improvements that GLP-1s and other healthcare innovations may bring.

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GLP-1s: gauging impact on Food & Bev

Bonnie Herzog answers key questions about how evolving consumer behavior from rising GLP-1s usage could impact Food & Beverage

The rising popularity of GLP-1 drugs has raised questions about if/how they could reshape consumer behavior and what that would mean for the Food and Beverage industry. Here, we address some of those key questions.

Q: Is there any evidence of consumption habits shifting due to greater adoption of GLP-1s for weight loss at this point?

A: It is too early to gauge the full impact of GLP-1s on consumption habits. While consumer interest in dieting and weight loss remains high, many unknowns about GLP-1s still exist. Indeed, it remains unclear how many consumers will ultimately use the medication for weight management, how long they will remain on them, and how persistent any potential related behavioral change would be. This makes it difficult to determine how greater GLP-1 adoption might accelerate or change current consumption trends, including the shift away from shelf-stable packaged food products toward fresh/frozen products and low-calorie/sugar-free beverage options.

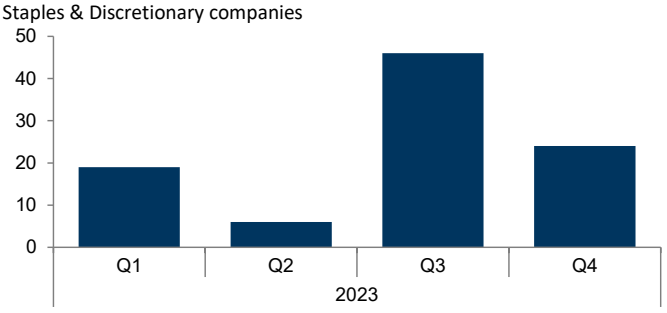
That said, data on early GLP-1 adopters suggests that GLP-1 usage tends to hurt weight loss aids like weight loss bars rather than the seemingly more vulnerable junk food category. At the same time, though, nutrition/protein shakes and bars as well as vitamins, minerals, and supplements (VMS) have thrived among early adopters, suggesting GLP-1 users are aiming to ensure that they are still getting adequate nutrition as they reduce their overall caloric intake. However, these trends could change as the drugs penetrate a wider range of the population.

Q: Are Food & Beverage (F&B) companies taking any steps to position for wider adoption of GLP-1s?

A: Long before GLP-1s had begun to rise in popularity for weight loss, F&B companies were already focused on increasing their appeal to more health-conscious consumers, including through portion control and more sugar-free and low sodium/fat options. Interest in GLP-1s has only added more fuel to this focus on health-consciousness. And some companies have begun to discuss ways to address specific needs of GLP-1 users, such as lower muscle mass, which could be an opportunity for some health & wellness (H&W) products such as protein products. Given that sales volumes among F&B companies more broadly remain challenged, companies are also focusing on creating premium versions of their products that they can sell at higher prices.

GLP-1 mentions peaked in 3Q23 earnings and have since faded

No. of occurrences (GLP-) in quarterly earnings transcripts of Consumer Staples & Discretionary companies



Source: GS Data Works, Refinitiv, Goldman Sachs GIR.

Q: How focused are investors in these industries on the GLP-1 theme, and how has the focus evolved?

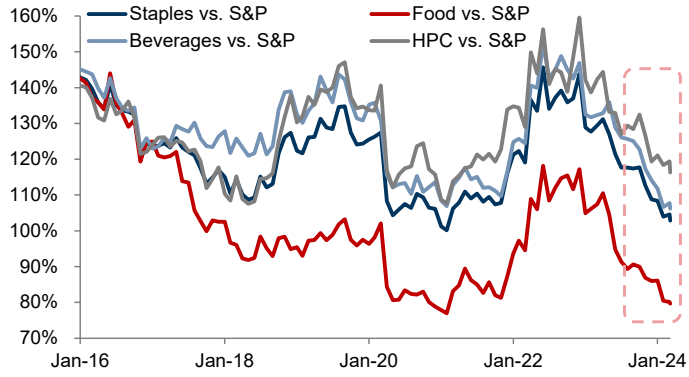
A: Interest in GLP-1s was certainly elevated throughout 2023 as investors attempted to assess the implications of GLP-1 use for weight loss. Management team mentions of, and time spent on, GLP-1s in Consumer Staples & Discretionary earnings calls suggest investor interest peaked in 3Q23 before moderating in 4Q23. That's consistent with the paucity of additional data on how these weight loss drugs may be changing consumer behavior. We think further GLP-1 developments—including how insurance coverage evolves—will continue to fuel interest and greater adoption rates.

Q: Are GLP-1 impacts priced into F&B stocks at this point, and how has that evolved?

A: Relative valuations meaningfully declined across Consumer Staples in aggregate over 4Q23, in part due to a moderation in the 10y UST yield at the end of 2023, but also due to concerns around volume trends and potential implications from greater GLP-1 adoption. This particularly weighed on F&B valuations, and more so Food which trades at a pronounced discount relative to the broader market and Consumer Staples category. Specifically, snacking volumes—which investors view as being at high risk from GLP-1 usage—came under pressure in 2023 alongside the rising popularity of GLP-1s for weight loss. While multiples will likely remain under pressure in the near term given low visibility on GLP-1 trends, favorable snacking fundamentals will likely ultimately win out, with a return to pre-Covid trends driving volume recovery and a re-rating in 2H24.

Staples' relative valuation contracted vs. the S&P 500 in 4Q23, with Food at a meaningful discount relative to the market

Staples valuations (NTM P/E) relative to S&P 500, %



Source: FactSet, Goldman Sachs GIR.

Q: What could the path for F&B companies look like going forward should GLP-1 drugs continue to gain in popularity/usage? Which sectors could benefit?

A: While H&W trends continue to gain traction, household penetration of GLP-1s remains low. This could change as GLP-1 drugs gain momentum which could drive competition among H&W companies. In this scenario, sub-sectors including H&W protein/nutrition bars and shakes and VMS will likely benefit the most. Smaller pack sizes with healthier attributes (e.g., low-sugar/sodium/fat, preservatives-free) should also remain attractive strategies for traditional F&B companies.

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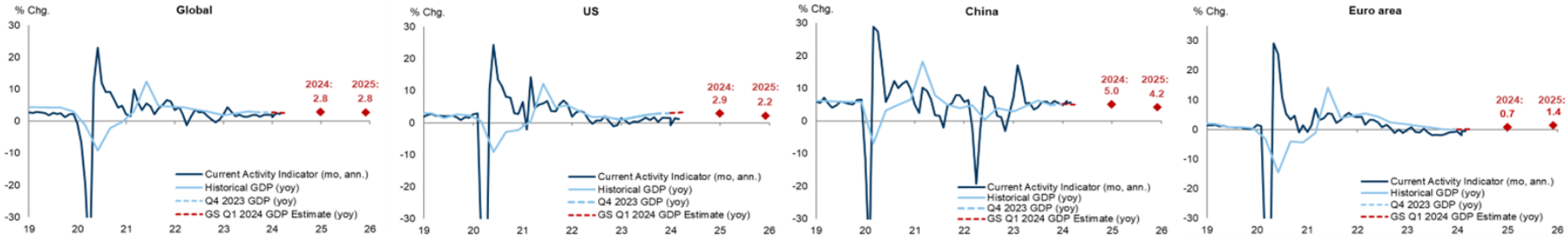
GS GIR: Macro at a glance

Watching

- **Globally,** we expect real GDP growth of 2.8% yoy in 2024, reflecting tailwinds from strong real household income growth, a gradual recovery in manufacturing activity, and a start to rate cuts as inflation cools. We expect global core inflation to fall back to around 2.25% by the end of 2024 as core goods inflation continues to decline, shelter inflation falls further, and both services inflation and wage growth continue to slow in response to the improved supply-demand balance across the global economy.
- **In the US,** we expect well-above-consensus real GDP growth of 2.5% in 2024 on a Q4/Q4 basis, reflecting easing financial conditions amid a start to Fed rate cuts and strong real disposable income growth. We continue to see a below-consensus 15% probability of entering a recession over the next 12 months. We expect the recent decline in year-on-year core PCE inflation to continue, reflecting further rebalancing in the auto, housing rental, and labor markets. We expect the unemployment rate to end 2024 at 3.8% and fall to 3.6% by end-2026.
- **We believe the Fed** will remain on hold at the current fed funds rate range of 5.25-5.5% until the first 25bp cut in July, after which we expect rate cuts to proceed at a quarterly pace with the next 25bp cut in November. On balance sheet policy, we expect the Fed to reduce the cap on Treasury runoff from $60bn to $30bn per month following the May FOMC meeting, although we see a risk that the Fed reduces the Treasury cap a bit further to slow the realized pace of overall runoff by half.
- **In the Euro area,** we expect real GDP growth to increase to 0.7% yoy in 2024, reflecting a pickup in real disposable income and a fading credit drag as the ECB turns toward rate cuts, which should more than offset the building headwind from fiscal policy. We expect core inflation to slow further to 2.3% yoy by December 2024, reflecting indirect pass-through from lower energy prices, continued declines in services inflation, and normalizing wage growth.
- **We believe the ECB** will remain on hold at 4.00% until the first rate cut in June, after which we expect sequential 25bp cuts in July and September, followed by quarterly cuts until the policy rate reaches 2.25%, for a total of four cuts in 2024 and three cuts in 2025.
- **In China**, we expect real GDP growth of 5.0% yoy in 2024 as growth headwinds such as a prolonged property downturn and the lack of confidence among households and private businesses are offset by strong exports and continued policy easing. We expect inflation to remain low in 2024, with continued PPI deflation and moderate CPI reflation amid the ongoing food price deflation, property downturn, and manufacturing overcapacity. Over the longer term, we maintain our cautious view on China's growth outlook given deteriorating demographics, property and local government deleveraging, and global supply chain de-risking.
- **WATCH US POLITICS AND GEOPOLITICS**. The all-but-certain Trump-Biden rematch in the November US general election could have important macro and market implications, especially if it brings the possibility of fresh unfunded fiscal expansion or a rise in the effective tariff rate. Elevated geopolitical tensions amid the ongoing conflict in the Middle East, the Russia-Ukraine war, and more fraught US-China relations could also have material market implications.

Goldman Sachs Global Investment Research.

Growth



Source: Haver Analytics and Goldman Sachs Global Investment Research.
Note: GS CAI is a measure of current growth. For more information on the methodology of the CAI please see "Improving Our Within-Month CAI Forecasts," Global Economics Comment, Mar. 06, 2023.

Forecasts

Economics

GDP growth (%)	2024				2025	
	GS (Q4/Q4)	Cons. (Q4/Q4)	GS (CY)	Cons. (CY)	GS (CY)	Cons. (CY)
Global	2.9	--	2.8	2.4	2.8	2.5
US	2.5	1.4	2.9	2.2	2.2	1.7
China	4.9	4.7	5.0	4.7	4.2	4.4
Euro area	1.3	1.1	0.7	0.5	1.4	1.4

Policy rates (%)	2024		2025	
	GS	Mkt.	GS	Mkt.
US	4.88	4.91	3.88	4.24
Euro area	3.00	3.24	2.25	2.59
China	1.70	1.82	1.70	--
Japan	0.13	0.31	0.38	0.57

Markets

Interest rates 10Yr (%)	Last	E2024	E2025
US	4.56	4.25	4.10
Germany	2.44	2.25	2.00
Japan	0.85	0.90	0.90
UK	4.16	3.75	3.75

Commodities	Last	3m	12m
Crude Oil, Brent ($/bbl)	90	85	80
Nat Gas, NYMEX ($/mmBtu)	1.76	2.00	4.00
Nat Gas, TTF (EUR/MWh)	29.40	30	32
Copper ($/mt)	9,210	9,500	12,000
Gold ($/troy oz)	2,346	2,600	2,700

FX	Last	3m	12m
EUR/$	1.07	1.08	1.12
GBP/$	1.25	1.30	1.35
$/JPY	153	155	145
$/CNY	7.22	7.15	7.05

Credit (bp)		Last	1H24	2H24
USD	IG	87	89	90
	HY	301	297	291
EUR	IG	120	121	120
	HY	356	341	336

Equities

S&P 500	E2024		E2025	
	GS	Cons.	GS	Cons.
Price	5,200	--	--	--
EPS	$241	$242	$256	$276
Growth	8%	8%	6%	14%

Consumer	2024		2025	
	CPI (%, yoy)	Unemp. Rate	CPI (%, yoy)	Unemp. Rate
US	3.1	3.8	2.4	3.7
Euro area	2.3	6.7	2.1	6.7
China	0.4	--	1.5	--

Returns (%)	12m	YTD	E2024 P/E
S&P 500	0	9.0	21.8x
MXAPJ	7	2.4	14x
Topix	6	16.1	16.6x
STOXX 600	7	5.3	13.9x

Wage Tracker 2024 (%)			
Q1	Q2	Q3	Q4
4.5	--	--	--
--	--	--	--
--	--	--	--

Source: Bloomberg, Goldman Sachs Global Investment Research. For important disclosures, see the Disclosure Appendix or go to www.gs.com/research/hedge.html.

Market pricing as April 11, 2024

Glossary of GS proprietary indices

Current Activity Indicator (CAI)

GS CAIs measure the growth signal in a broad range of weekly and monthly indicators, offering an alternative to Gross Domestic Product (GDP). GDP is an imperfect guide to current activity: In most countries, it is only available quarterly and is released with a substantial delay, and its initial estimates are often heavily revised. GDP also ignores important measures of real activity, such as employment and the purchasing managers' indexes (PMIs). All of these problems reduce the effectiveness of GDP for investment and policy decisions. Our CAIs aim to address GDP's shortcomings and provide a timelier read on the pace of growth.

For more, see our CAI page and Global Economics Analyst: Trackin' All Over the World – Our New Global CAI, 25 February 2017.

Dynamic Equilibrium Exchange Rates (DEER)

The GSDEER framework establishes an equilibrium (or "fair") value of the real exchange rate based on relative productivity and terms-of-trade differentials.

For more, see our GSDEER page, Global Economics Paper No. 227: Finding Fair Value in EM FX, 26 January 2016, and Global Markets Analyst: A Look at Valuation Across G10 FX, 29 June 2017.

Financial Conditions Index (FCI)

GS FCIs gauge the "looseness" or "tightness" of financial conditions across the world's major economies, incorporating variables that directly affect spending on domestically produced goods and services. FCIs can provide valuable information about the economic growth outlook and the direct and indirect effects of monetary policy on real economic activity.

FCIs for the G10 economies are calculated as a weighted average of a policy rate, a long-term risk-free bond yield, a corporate credit spread, an equity price variable, and a trade-weighted exchange rate; the Euro area FCI also includes a sovereign credit spread. The weights mirror the effects of the financial variables on real GDP growth in our models over a one-year horizon. FCIs for emerging markets are calculated as a weighted average of a short-term interest rate, a long-term swap rate, a CDS spread, an equity price variable, a trade-weighted exchange rate, and—in economies with large foreign-currency-denominated debt stocks—a debt-weighted exchange rate index.

For more, see our FCI page, Global Economics Analyst: Our New G10 Financial Conditions Indices, 20 April 2017, and Global Economics Analyst: Tracking EM Financial Conditions – Our New FCIs, 6 October 2017.

Goldman Sachs Analyst Index (GSAI)

The US GSAI is based on a monthly survey of GS equity analysts to obtain their assessments of business conditions in the industries they follow. The results provide timely "bottom-up" information about US economic activity to supplement and cross-check our analysis of "top-down" data. Based on analysts' responses, we create a diffusion index for economic activity comparable to the ISM's indexes for activity in the manufacturing and nonmanufacturing sectors.

Macro-Data Assessment Platform (MAP)

GS MAP scores facilitate rapid interpretation of new data releases for economic indicators worldwide. MAP summarizes the importance of a specific data release (i.e., its historical correlation with GDP) and the degree of surprise relative to the consensus forecast. The sign on the degree of surprise characterizes underperformance with a negative number and outperformance with a positive number. Each of these two components is ranked on a scale from 0 to 5, with the MAP score being the product of the two, i.e., from -25 to +25. For example, a MAP score of +20 (5;+4) would indicate that the data has a very high correlation to GDP (5) and that it came out well above consensus expectations (+4), for a total MAP value of +20.

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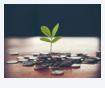

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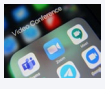

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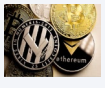

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