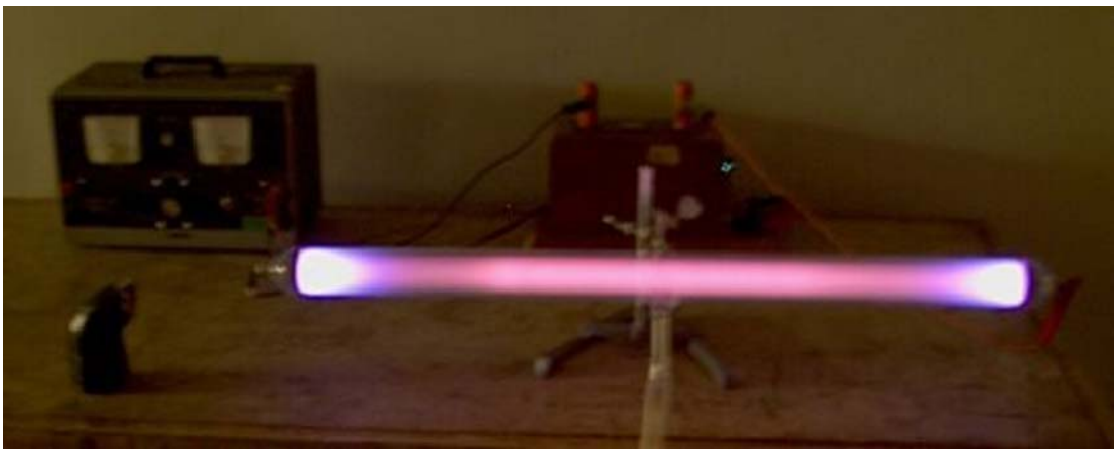
Angeles
INVESTMENT ADVISORS

Commentary
Third Quarter 2013

Elektron



Fossilized tree resin has been valued by humans since antiquity. Its essence was used in perfume (still is), and its translucent beauty evokes captured sunlight, prized as jewelry, then and now. The ancient Greeks called this substance, elektron (*sunbeam*), which was later translated into Arabic as *ambar*, and known to us as amber. The Greeks noted another magical property of this substance: that when rubbed with fur, it attracts small objects by some unexplained phenomenon. In 1600, English scientist William Gilbert reached back to the Greeks to give this phenomenon a Latin name: *electricus*.

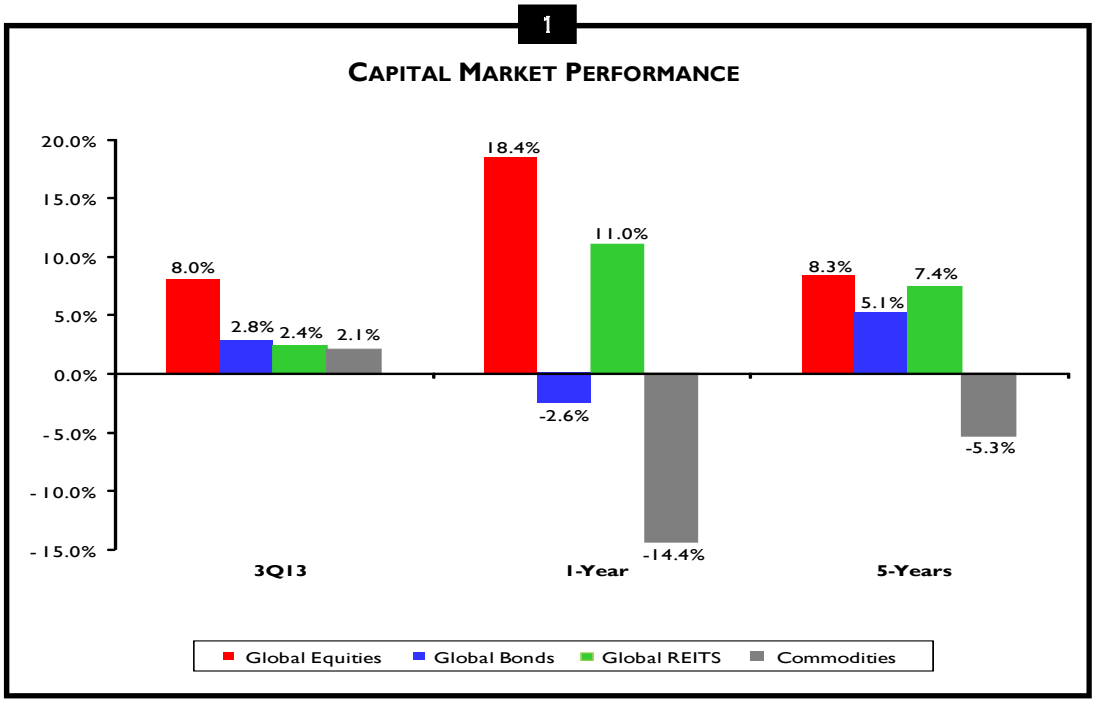
Electricity has long fascinated us, although its nature and origin remained a mystery for millennia. In the early 18th century, Benjamin Franklin proposed that electricity was produced by an unseen fluid under different pressures, which he named positive and negative.[1] Little was understood about electricity well into the 19th century, but it was a popular form of entertainment in Europe. Traveling scientists would impress crowds with a demonstration of a glass tube with wires on opposite ends; with as much air as possible pumped out of the tube, a high voltage passing across the wires caused the glass to glow in fluorescent colors. Magic!

Of course, there is always[2] a scientific explanation for magic, but this phenomenon defied explanation. It seemed that the multicolored light came from some sort of ray emitted by the cathode. At the time, it was theorized that light was carried through empty space by an invisible ether, so perhaps this cathode ray was similar to light waves, manifested in fluorescent colors. Other scientists speculated that these rays were not light waves at all, but actually some kind of material particle.

[1] His theory was wrong, of course, but we adopted his nomenclature of positive and negative charges.

[2] Well, maybe almost always.

1



The great German physicist Heinrich Hertz attempted to resolve the question of whether cathode rays were waves or particles. He found that he could move the rays by placing a magnet near the glass, thus the rays behaved as particles. But when he passed the rays through an electric field, they were not deflected in the way electrically charged particles were expected to be. Hertz then placed a metal foil in the path of the rays: the glass somehow still glowed, as if the rays had passed through the foil. This suggested that they were not particles after all, but waves. But then Hertz couldn't explain how they could be manipulated by magnets if they weren't particles.

So the nature of these light-emitting cathode rays remained unexplained. The mystery of the cathode rays was eventually solved by a remarkable scientist. He devised new experiments by thinking about the challenge differently, and was able to make a crucial, creative leap of imagination that unlocked the secrets of our universe.

Capital markets rebounded strongly in the third quarter after a mid-year stumble. Equities led the pace with an 8% advance, with particularly strong results from the European periphery: Spain rose 25% and Greece surged 33%, both rewarded for their progress in reducing their budget and trade deficits. Best of all in the quarter was Argentina, up 38%, on the back of (temporarily) stronger growth. Not as fortunate was Indonesia, off 24% in the quarter as the rupiah plunged 13%.

US stocks trailed the rest of the world last quarter, weighed down by the dollar's 3 ½% decline. Gold and silver each gained more than 10% in the quarter, but both are still off more than 20% in 2013. Food should be cheaper, as soybeans lost 18% and corn plunged 35% in the past three months, but that dessert will cost more as cocoa prices leaped 20%.

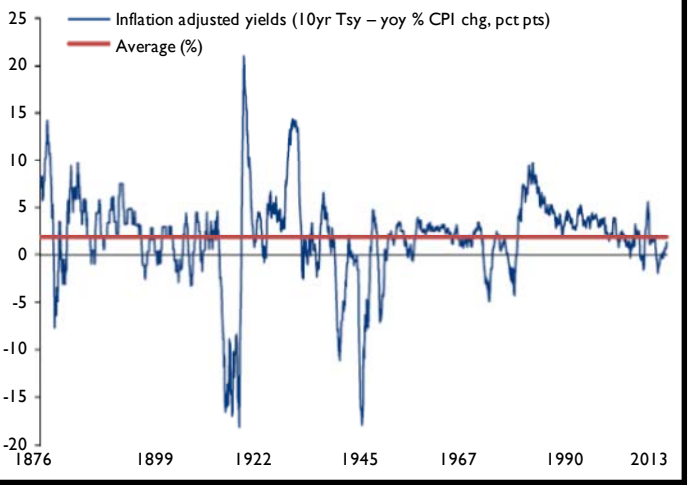
Bonds recovered some of their losses from earlier in the year. The gains came all in the last few weeks of the quarter following the

surprise announcement that the Fed would not make any change to its policy of buying $85 billion of bonds each month. From the beginning of May to the beginning of September, 10-year Treasury yields nearly doubled, from about 1 ½% to almost 3%, but have since rallied 50 basis points.

Bonds are still posting a negative total return for the year,[3] even after the recent rally. This is a rare occurrence, as only twice since 1976 have bonds been in the red for a calendar year.[4] Historically, earnings from the coupon have been more than enough to offset any decline in prices. But with yields so low, there is very little margin to protect investors from rising rates.[5]

2

INFLATION ADJUSTED TREASURY YIELDS
1876-2013



Source: Global Financial Data, BofA Merrill Lynch Fixed Income Strategy Research

"Interest rates are largely determined by inflation."

Interest rates are largely determined by inflation. On average, over time, yields on government bonds have been about 1.9% above inflation (Chart 2). Fluctuations in the real (i.e., after-inflation) yield have been due mostly to differences between expected and actual inflation rates. Currently, investors expect inflation to average a little over 2% in the coming decade, so a reasonable expected yield on government bonds should be about 4%,[6] versus the 2 ½% we currently have.

Both actual inflation and inflation expectations have been quite stable over the past few years. Central banks, on the whole, have been successful in counterbalancing the deflationary effects of massive deleveraging with unprecedented injections of excess reserves into the banking system. This balance has held reasonably constant, hence inflation, and expectations, have been stable. At least, for now, because even as inflation is quiescent and is expected to remain so, longer term, the risks of both much higher inflation and even deflation may be rising.

The surge in excess reserves in the banking system has not led to inflation because the money multiplier has plummeted (Chart 3), meaning that reserves remain on banks' balance sheets and are not placed in circulation. But as households and banks repair their balance sheets, both the demand for and supply of credit may increase and inflationary pressures could build. The Fed can offset this by withdrawing liquidity, but policy may err on accepting higher inflation, particularly as government debt continues to expand. Conversely, deflation could occur if negative real yields are maintained indefinitely, encouraging speculative excesses that eventually burst in a deflationary bubble. So the irony is that even as inflation risks have diminished in the near term, over time, the range of inflationary outcomes may be much wider.

If interest rates are determined by inflation

[3] US bonds, as measured by the Barclays Aggregate Index, are off about 1% year-to-date through October.
[4] 1999: -0.8% and 1994: -2.9%.
[5] As we cautioned in *Play Well*, January 2013.
[6] 1.9% historical real yield + 2.1% expected inflation = 4%.

over time, inflation is, *always and everywhere*,[7] a function of monetary policy. Friedman's dictum is widely accepted now, but perhaps less appreciated is just how important monetary policy is to the broader economic output. In a very simplistic model, nominal growth of GDP trends positive when interest rates are less than the growth rate, and trends lower when interest rates are above the growth rate (Chart 4). As nominal GDP growth plunged to its lowest pace since the 1930s, the challenge for central bankers was to stay in front of this wave by pushing interest rates ever lower. Where central bankers were successful (the Fed), economies have been able to grow. Where policy has lagged (the ECB), economies have struggled.

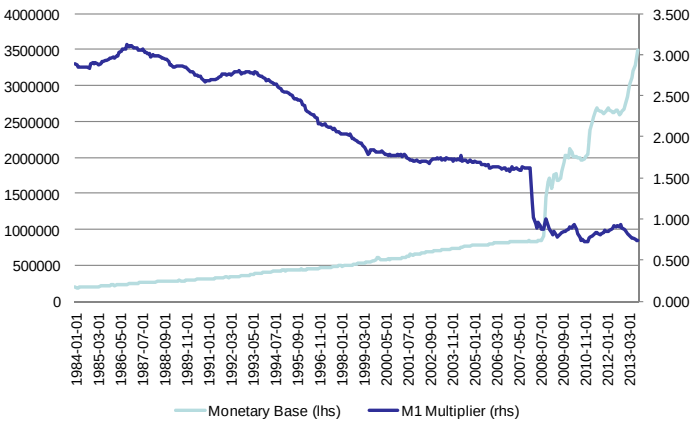
"inflation is, always and everywhere..."

The European economy contracted in 2012 and will again in 2013, although growth has recently turned fractionally positive. But *fractionally positive* may be the upper bound of growth Europe can hope for in the near future. In contrast to the US, the employment picture has deteriorated substantially over the past six years in every European country but Germany (Chart 5, page 5). Certainly, the social and political tensions associated with no growth and high unemployment, especially among youth, are contributing to the rising popularity of xenophobic, fascist parties across Europe.[8]

There has been just enough liquidity supplied by the ECB to ameliorate partially the punitive borrowing costs of the peripheral countries and banks (Chart 6, page 5), but there has been no meaningful progress in reducing unsustainably high levels of debt (unlike in

3

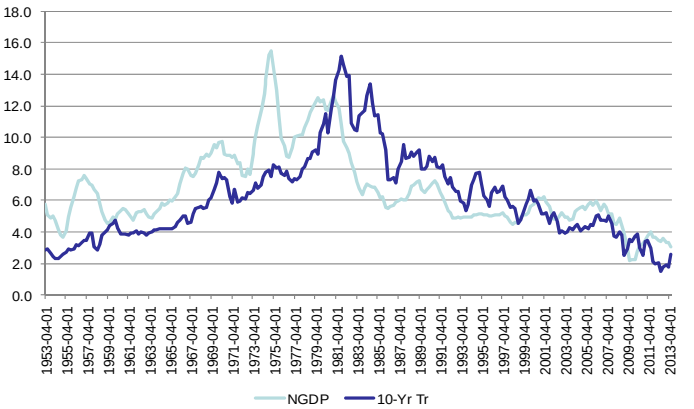
MONETARY BASE & M1 MULTIPLIER, 1984-2013



Source: FRB - St. Louis

4

NOMINAL GDP AND TREASURY YIELDS, 1953-2013



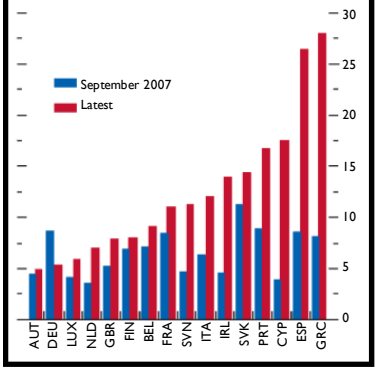
Source: FRB - St. Louis

[7] Milton Friedman, *The Counter-Revolution in Monetary Theory*, 1970.

[8] Among many are the Freedom Party (Austria), Golden Dawn (Greece), National Front (France).

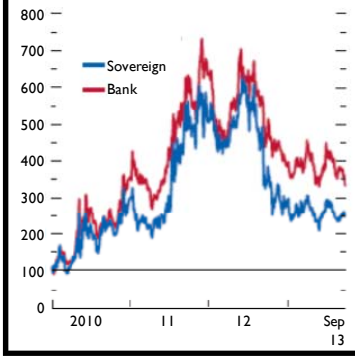
5

TOTAL UNEMPLOYMENT RATE (%), EUROPE



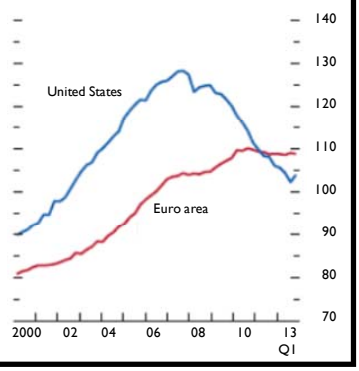
6

EUROPE PERIPHERY: BANK & SOVEREIGN CDS SPREADS



7

HOUSEHOLD DEBT-TO-INCOME RATIO

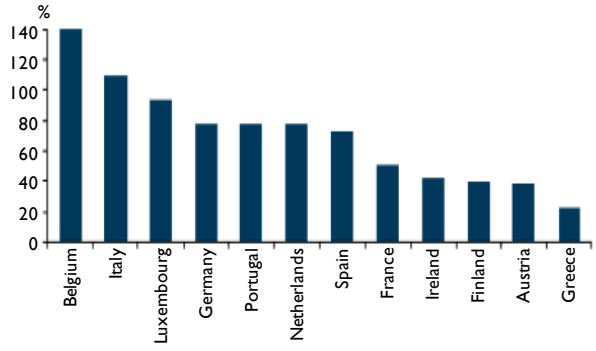


Source: IMF, World Economic Outlook, October 2013

"the interdependency of each to the other could compound significantly the risks of another financial crisis..."

8

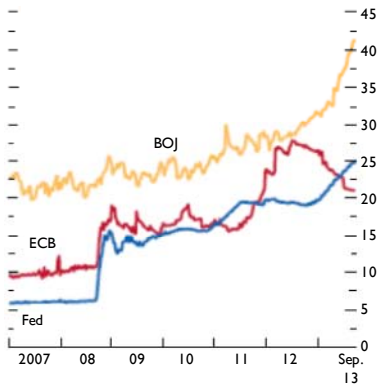
BANKS' GOVERNMENT DEBT HOLDINGS AMOUNT TO A LARGE FRACTION OF CAPITAL AND RESERVES IN SEVERAL EURO AREA MEMBER STATES



Note: The data are for September 2013. The bond holdings data relate to monetary and financial institutions excluding the Eurosystem.
Source: EBC

9

CENTRAL BANK TOTAL ASSETS (PERCENT OF 2008 GDP)



Source: IMF, World Economic Outlook, October 2013

the US—Chart 7). Should there be a stumble in the finances of either sovereign borrowers or European banks, the interdependency of each to the other could compound significantly the risks of another financial crisis. Banks in many countries hold, and continue to buy, government debt in amounts that exceed even their countries' GDP (Chart 8), thus a default, either by a sovereign or in the banking system, would trigger a broader crisis.

A big winner this year is Japanese equities, up over 20% in dollar terms, and nearly 40% in yen terms. A major flood of liquidity (Chart 9) sparked the equity rally this year, as well as the large sell-off in the yen. This has been a powerful boost to the economy with a surge in exports, but absent additional actions, the economy will likely fade next year as domestic demand is flat and taxes are due to rise.

The largest downward revision in growth this year has been in the emerging economies. Equity markets have responded with a decline of 6% year-to-date, well behind the 19% gain in developed markets.

Over the past decade, emerging economies benefitted from a number of very favorable trends. The impact of China's integration into the world economy cannot be overstated, increasing global demand and boosting productivity. The structural rise in commodity prices, spurred by Chinese demand and supply shortages following decades of underinvestment, improved the terms of trade for many countries. Debt fell with strong growth, and inflation and interest rates declined worldwide. Valuations were particularly cheap in the aftermath of the 1998 Asian crisis, and all these factors came together for a decade-plus period of remarkable performance in both economies and capital markets.

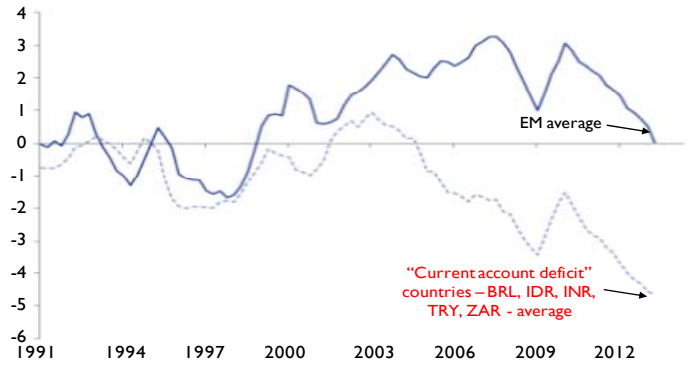
"Now, many of these trends have reversed."

Now, many of these trends have reversed. China is still growing, but the years of 10-12% growth are behind. Current accounts have moved from surplus to deficit (Chart 10). Profitability, which had perennially been much higher than the rest of world, has now converged (Chart 11). Equity markets follow the path of relative economic growth, which is now falling (Chart 12).

Particularly vulnerable are countries running current account

10

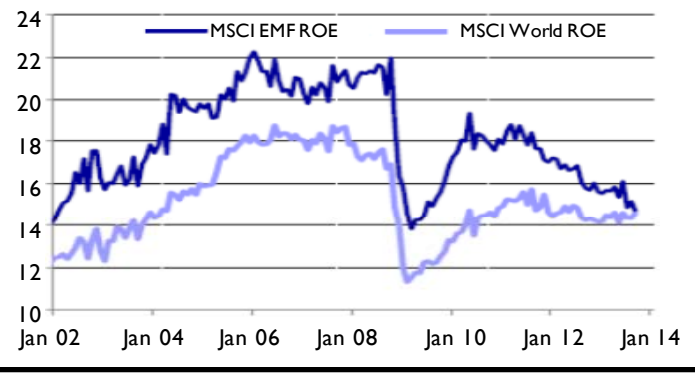
CURRENT ACCOUNT BALANCE, % GDP (4TR MA)



Source: Goldman Sachs Global Investment Research.

11

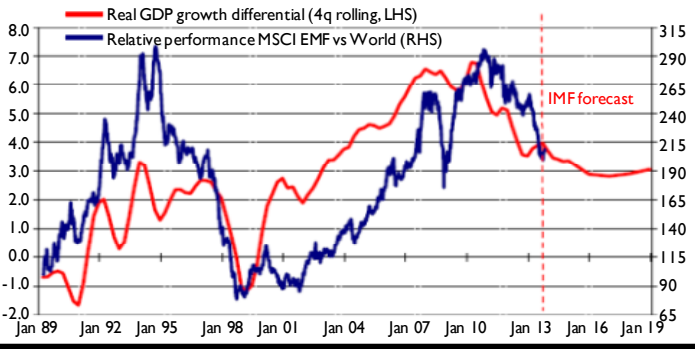
MSCI EMERGING MARKETS & MSCI WORLD 12 MONTH FORWARD RETURN ON EQUITY (%)



Source: MSCI, I/B/E/S, Credit Suisse research

12

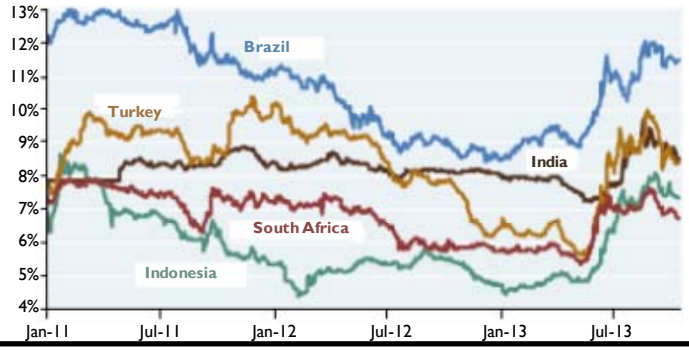
OECD RELATIVE TO EMERGING MARKET REAL GDP GROWTH DIFFERENTIAL VS. MSCI EMF/WORLD PERFORMANCE



Source: MSCI, OECD, IMF, Credit Suisse estimates

13

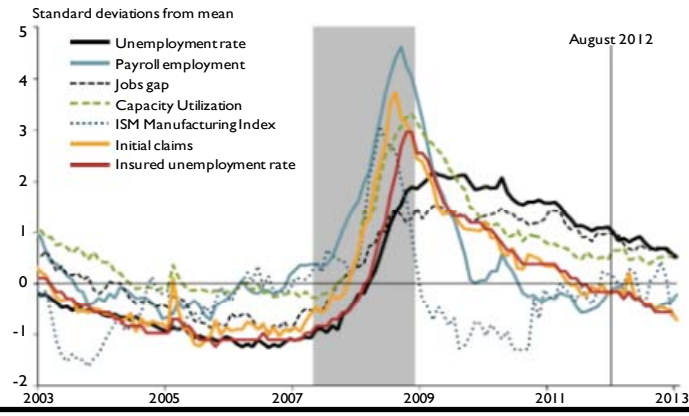
EMERGING MARKET 5 YEAR GOVERNMENT BOND YIELD (PERCENT)



Source: Bloomberg, October 2013. Courtesy: JP Morgan

14

PATHS OF LEADING INDICATORS FOR UNEMPLOYMENT



Source: Bureau of Labor Statistics, Conference Board, Federal Reserve Board of Governors, Institute of Supply Management, Department of Labor, and FRBSF staff calculations.

deficits. A deficit in the current account is neither good nor bad; it is simply the difference between domestic savings and investment. A deficit improves economic growth when there is a low capital stock relative to attractive investment opportunities. But a deficit also means an economy is subject to capital outflows if investment opportunities are not as favorable as previously assumed.

As economic growth slowed, and as interest rates rose in the US earlier this year, capital began to flow out of many emerging economies. Those especially dependent on foreign capital (Brazil, India, Indonesia, South Africa, Turkey), responded by raising interest rates (Chart 13) and selling reserves in order to support their currencies and stem the capital outflow. But with slowing domestic demand, high inflation and rising corporate leverage, these economies remain exposed to the risks of further outflows and weakening currencies, which have already lost 20-30% of their value this year.

Spotty, but sustained, progress characterizes the US economy. Retail sales and industrial production are both up more than 3% in the past year, with auto production especially strong, rising 11% from a year ago. In the past year, wages are up more than 4% and the unemployment rate is down 0.6% even as the labor force grew by 378,000. Employment growth has been about 1% greater than labor force growth, so the employment picture is, slowly, improving, and is likely to continue to do so.

"Spotty, but sustained, progress characterizes the US economy."

Researchers at the San Francisco Federal Reserve Bank identified six key indicators that, collectively, have historically been robust predictors of the path of future employment growth. Some factors relate to production, such as capacity use and manufacturing growth, others are employment-related, such as initial jobless claims. Importantly, all are moving in a direction consistent with a stronger labor market (Chart 14).

Exchange rates are driven by many factors—competitiveness, growth, inflation— but broadly, they reflect relative economic conditions and prospects. In the 40 years of floating exchange rates[9] there have been five

[9] On 15 August 1971, through Executive Order, President Nixon suspended the convertibility of the dollar into gold or other reserve assets.

distinct periods of fluctuations in the value of the dollar (Chart 15). The most recent period, since 2000, has seen the dollar lose 30% of its value, reflecting the relative poor growth of the US economy, especially against the emerging nations. But the US is well in front of Europe and Japan in deleveraging and, despite (or perhaps, because of) the political circus in Washington, the fiscal deficit is shrinking. The current account balance is also improving, boosted by surging domestic energy production.

15

TRADE WEIGHTED U.S. DOLLAR INDEX:

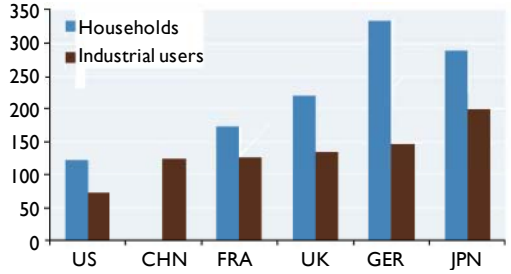
Source: Board of Governors of the Federal Reserve System

"One such challenge is the size, scope and function of the federal government"

The monthly trade deficit is more than $5 billion smaller than a year ago, with exports up 3.9% and imports up just 0.9%. Petroleum accounts for most of this, with oil exports up 32% and imports down 6%. Non-petroleum exports are up only 1.2% and non-oil imports are up 2.4% in the past year. Since 2007, petroleum exports have nearly quadrupled. In addition to helping to improve the trade deficit, domestic production has created a huge competitive advantage for industries. Natural gas prices are about $3 (per million btu) in the US compared with about $10 in Europe and $17 in Japan. Americans enjoy the lowest electricity costs among the major countries in the world (Chart 16).

16

ELECTRICITY PRICES BY REGION (USD PER MWH)

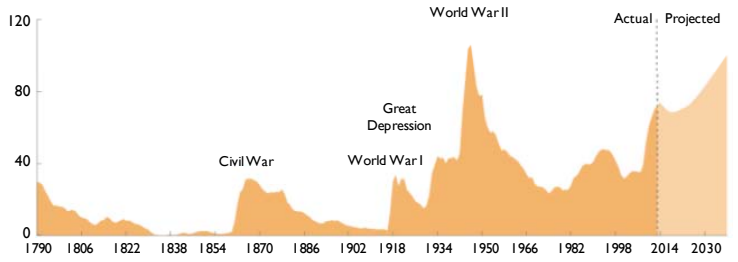


Source: IEA, National Development and Reform Commission. Q2 2012

There are many short-term issues facing the US, but relative to the rest of the world, the US economy appears to have numerous advantages. At least in the near term. The biggest challenges lie in the coming decades.

17

FEDERAL DEBT HELD BY THE PUBLIC UNDER CBO'S EXTENDED BASELINE (PERCENTAGE OF GDP)



Source: Congressional Budget Office. For details about the sources of data used for past debt held by the public, see Congressional Budget Office, *Historical Data on Federal Debt Held by the Public (July 2010.* www.cbo.gov/publication/21728

One such challenge is the size, scope and function of the federal government. Federal debt is currently around 73% of GDP, twice what it was in 2007, and the highest in US history, but for a brief period following World War Two (Chart 17). It is projected to rise to 100% of GDP over the next 25 years under some favorable assumptions.[10]

Servicing the debt will rise to 5% of GDP by 2038, compared with the 2% average over the last 40 years. Entitlement spending—Medicaid, Medicare and Social Security—will double to 14% of GDP from the 7% average in the past. Spending on everything else,

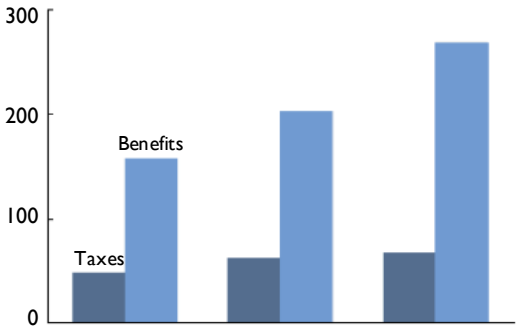
known as *discretionary spending*,[11] will decline to 7% of GDP, in contrast to the 11% average of the past four decades, which would be the lowest level since the 1930s. It is clear that reform of entitlement programs is necessary.

Social Security is the single largest government program. Over 57 million people receive more than $800 billion in benefits this year, one-quarter of all federal spending. In 25 years, over 100 million people will receive Social Security payments, although the trust fund is projected to run out of money in 20 years.

The gap in Medicare funding is even wider. Those born in the 1940s will have paid about $45,000 in payroll taxes and received $160,000 in benefits (net of premiums paid) in the course of their lifetimes. For those born in the 1960s, they will have paid about $65,000 in taxes and received $270,000 in benefits over their lives (Chart 18). Is there any doubt that none of this is sustainable?

18

MEDIAN LIFETIME MEDICARE PAYROLL TAXES AND BENEFITS FOR VARIOUS COHORTS, BY DECADE OF BIRTH



Source: Congressional Budget Office
Note: The amounts shown here are present values. To calculate a lump-sum present value, amounts are adjusted to remove the effects of inflation (to produce constant dollars) and discounted to the value for beneficiaries at age 65. Benefits are net of premiums paid by beneficiaries.

Cavendish Laboratory is the renowned physics institute founded at Cambridge University in 1874. James Clerk Maxwell, originator of electromagnetic theory, was its first head.[12] Maxwell was succeeded in 1879 by Lord Rayleigh, and then a few years later in 1884 by an exceptional 28 year-old mathematician from Manchester named Joseph John (J.J.) Thomson. A decade later, Thomson took up the question of the nature of cathode rays, designing three experiments to answer definitively the question of whether they were waves or particles. In doing so, he reached a startling revelation that transformed our understanding of the universe.

A French physicist, Jean Perrin, had previously noted that cathode rays deposit an electric charge, and Thomson wanted to see if he could separate that charge from the rays. Using magnets to bend the rays and measuring the charge proved that the rays and their electric charge could not be separated.

Secondly, scientists had been baffled in attempting to bend cathode rays with an electric field, a failure that suggested a wave-like nature of the rays. But Thomson suspected that miniscule traces of gas remaining in the tube were acting like an electrical conductor, sheathing the rays from electrical interference. Painstakingly, he worked to remove every trace of gas from the tube, and when he did, found that the cathode rays did indeed bend in an electric field.

Thomson concluded from these two experiments that, in his words, "cathode rays are charges of negative electricity carried by particles of matter." But what were these particles? In his third experiment, he aimed to find out.

Thomson had no way of measuring directly the mass or electric charge of these particles, but he could measure how much the rays were bent by a magnetic field, thus determining how much energy they carried. He

[10] Principally, by ignoring the harmful effects of rising debt on economic growth.
[11] A misleading term, really: other than interest on the debt, isn't *everything* discretionary?
[12] Maxell unified electricity and magnetism as a single force, one of the four fundamental forces in the universe (along with gravity, the strong and weak nuclear forces).

could then calculate the ratio of the mass of the particle to its electric charge.

Ancient Greek philosophers hypothesized that matter could be divided into ever smaller components until it could be divided no further. They called this smallest possible particle of matter, *atomos*, meaning indivisible. Thousands of years later, chemical experiments were able to identify the smallest possible particles and called them, appropriately, atoms. But J.J. Thomson, in an astonishing discovery, calculated that the mass-to-energy ratio of cathode rays was more than one thousand times smaller than the hydrogen atom. It appeared that atoms were not *atomos*, indivisible, after all, but contained constituent parts.

"...the path to understanding lies in digging deeper and deeper into the mysteries of life."

Not surprisingly, Thomson's calculations met with skepticism and resistance, but the electron turned out to be only the first of the fundamental particles (so far) identified: protons and neutrons were later discovered to constitute the nucleus of the atom, but even the nucleus consists of sub- sub-atomic particles.

Thomson's experiments taught us to look deeper, to think deeper, in order to discover new truths. Today's news is filled with dysfunctional politics that veer from crisis to crisis. All true, but below that surface is an economy making steady progress toward repair. At a deeper level is the eventual unsustainability of government functions as currently constituted. Investors are rewarded for their analyses at all levels.

Through diligent effort and a willingness to embrace even astonishing, unconventional ideas, Thomson laid the foundation for our modern world. No aspect of our technology today would be possible without his work.

The discovery of the electron is certainly among the most important scientific advances in history. For this alone, J.J. Thomson is one of the most prominent figures in science, rightly awarded the Nobel Prize in Physics in 1906. But what makes Thomson perhaps the single most influential scientist in history is that eight of his research assistants went on to win the Nobel Prize, including his son, George, in 1937, for discovering the wave-like properties of the electron. The Cavendish Laboratory that Thomson helped build would spawn 29 Nobel Laureates in the coming decades. As an experimenter, a discoverer, and maybe most importantly, as a teacher, J.J. Thomson showed us that the path to understanding lies in digging deeper and deeper into the mysteries of life.

Founded in 2001, Angeles Investment Advisors LLC provides investment advice to select institutions and high net worth families and individuals.

MICHAEL A. ROSEN
PRINCIPAL & CHIEF INVESTMENT OFFICER
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