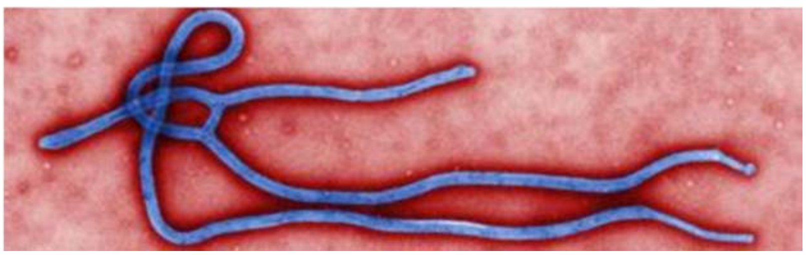
Plague



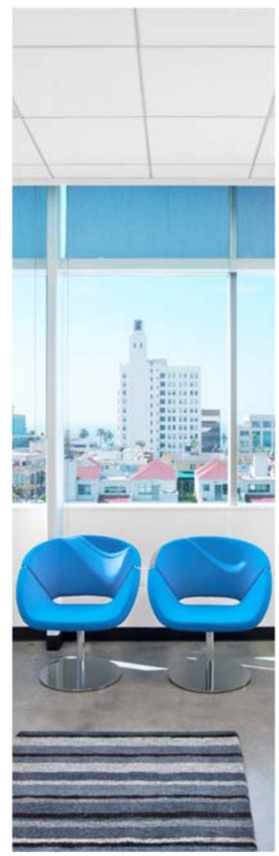
Twenty million people died in the four brutal years of the Great War. Thus, the armistice of 11 November 1918 was greeted with the profound joy borne of sheer exhaustion. At 11am on that day, bells tolled across nearly every country in the four corners of the world, a minute of silence for the survivors to give thanks and to pay respect to the loved ones lost.

At this moment of joyous celebration, no one was aware of the calamity about to beset the globe. Within weeks, a disaster would claim four times the number of deaths that were suffered in the previous four years of war. 1918, a year that might have been celebrated as a return to normalcy[1] after so much senseless slaughter, was instead the year that saw the single greatest disaster in human history.

High in the mountains of southwest China grows the aptly named *illicium verum*, from the Latin true (*verum*) allure (*illicio*). Its fruit, the Chinese star anise, is prized as a popular spice used throughout Asian cuisine. Traditional Chinese medicine prescribes the plant as a tea remedy for rheumatism, and its seeds are chewed to aid digestion. The fruit is harvested only between March and May of each year. Chemically, the seeds of the Chinese star anise contain shikimic acid, but extracting this acid takes a complicated ten-stage process over the course of a full year. Shikimic acid is found in other plants, but today virtually the entire world's supply is harvested from this particular plant in this remote mountainous region.

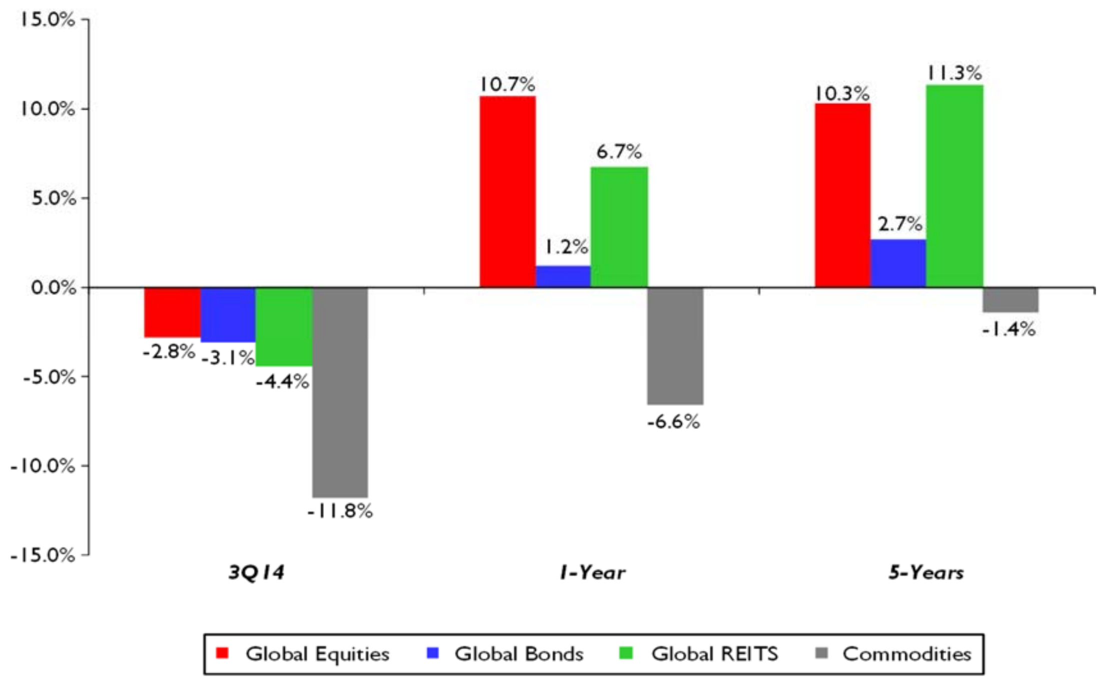
In the mid-1990s, three scientists working at a small company called Gilead Sciences[2] south of San Francisco were experimenting with shikimic acid. C.U. Kim, W. Lew and X. Chen discovered that it had the ability to block the viral neuraminidase enzyme, the

[1] Warren G. Harding's presidential campaign slogan of 1920.
[2] Now a nearly $200b biotech juggernaut.



1

CAPITAL MARKET PERFORMANCE



"…a pre-shock to the quake that followed…"

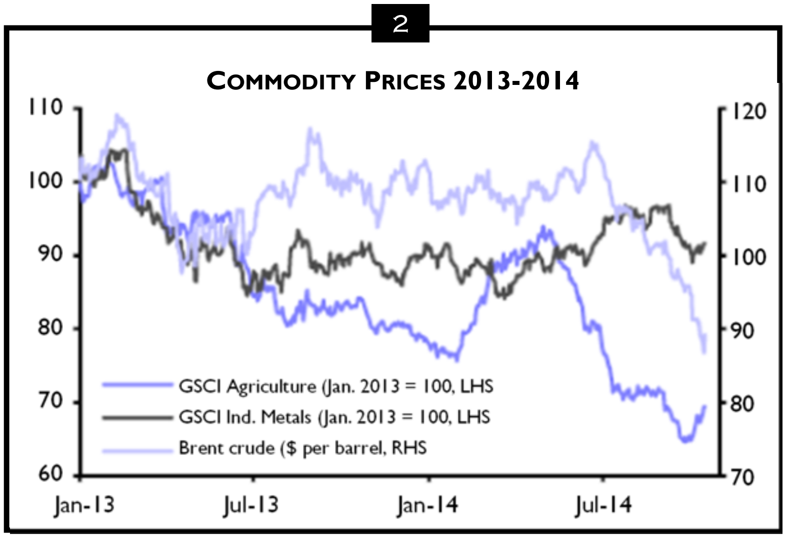
key enzyme of influenza A and B, from releasing new viral particles. They developed shikimic acid into a drug named oseltamivir, a chemically inactive capsule that is activated when it reaches the liver. Gilead, being a small company then, licensed oseltamivir to Roche, which has marketed it under the name Tamiflu® ever since. The World Health Organization (WHO) continues to categorize oseltamivir as one of the essential medicines all hospitals should hold in stock.

The development of oseltamivir came 80 years too late for the victims of the 1918 pandemic, and nearly a hundred years later, there is still much we don't know about how it developed and why it was so virulent. Still, there are lessons to be drawn, both for medical professionals as well as for professional investors.

All major asset classes declined in the third quarter of 2014, but this only proved to be a pre-shock to the quake that followed in early October. As usual, some countries bucked the trend—US equities were fractionally higher. Egypt and the U.A.E continued to lead global markets, each up 25% in the quarter. As the Mideast led, Europe faltered, with Austria, Greece and Portugal all falling more than 20%.

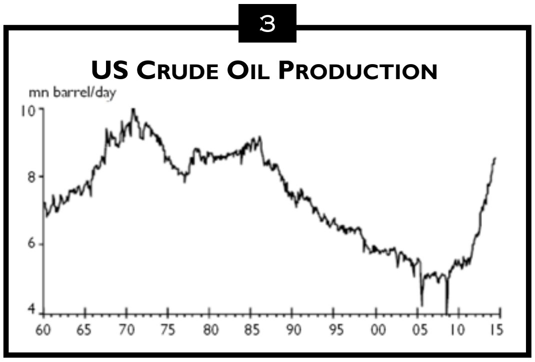
Commodities were hit especially hard, led by agriculture (Chart 2, page 3).

2



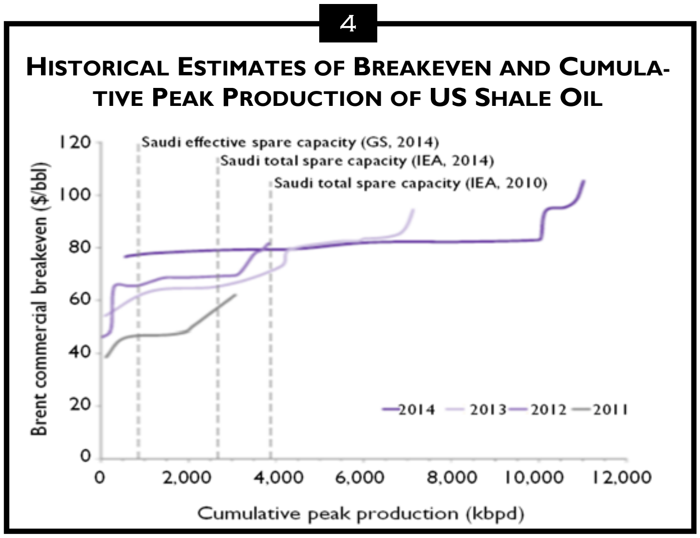
Source: Thomson Datastream *Courtesy: Capital Economics*

3



Source: BLS, Haver Analytics *Courtesy: Barclays Capital*

4



Source: IEA, Goldman Sachs Global Investment Research

Corn, soybeans, cotton are all down 25-30% this year. Bucking the trend on supply disruptions is cocoa, up 20% this year (Ivory Coast is in a bad neighborhood—civil wars and Ebola are just two of its problems) and coffee, jumping 75% in 2014 (California is not the only place with a drought—Brazil is parched).

Oil prices have also declined precipitously, off 30% from their highs, as moderately weaker demand met a substantial increase in supply, especially from US shale. The US is producing 9 million barrels of oil per day (and rising), approaching peak production of forty years ago (Chart 3).

As the largest (and lowest cost) producer in the world, Saudi Arabia has long been the marginal supplier of oil, thus dictating the price of oil on world markets by either releasing or restraining its supplies. Driven by both economic and political interests, the Saudis actively manage the price of oil, but generally favor it to be high (but not so high that it reduces long-term demand) and stable. But the days of Saudi control of the world price of oil may be over. A few years ago, Saudi spare capacity was estimated at 4 million barrels per day. Today, that spare capacity has shrunk to

"California is not the only place with a drought...."

3 million, and effectively may indeed be as little as 1 million. In the meantime, US shale production has increased to 5 million barrels per day, with a potential capacity more than twice that (Chart 4, page 3). US shale oil has dramatically altered the economic and political dynamics of oil, and thus the global economy.

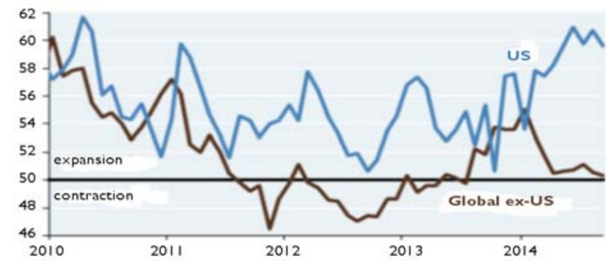
Energy is not the only area in which the US economy is leading the world. US manufacturing is strong and expanding while the rest of the world exhibits little growth (Chart 5). Industrial production grew at a 4.3% annual pace in the third quarter, and is up 4.4% over the past year, as is retail sales, paced by healthy auto sales, which are up 9.5% in the past year.

"...US manufacturing is strong and expanding while the rest of the world exhibits little growth."

The employment data have been consistently strong this year. The unemployment rate was 7.2% last September, and has fallen to 5.9%. Over the past year, 389,000 new jobseekers joined the labor force, while civilian employment rose 2.3 million to a new high of 146.6 million people. Initial claims for unemployment have fallen to levels last seen in the 1970s, when the workforce was less than 90 million (Chart 6). Wages rose at a 3% annual pace in the third quarter, hours worked are at a recovery high

5

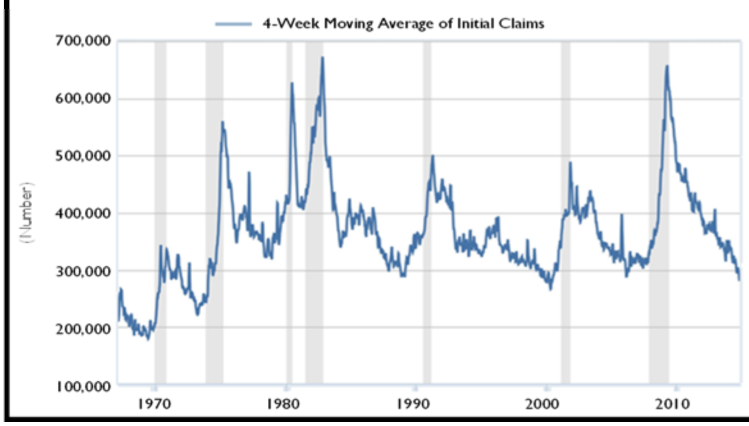
Manufacturing Output PMI (A Real-Time Proxy for GDP Growth)



Source: J.P. Morgan Securities, Markit, September 2014

6

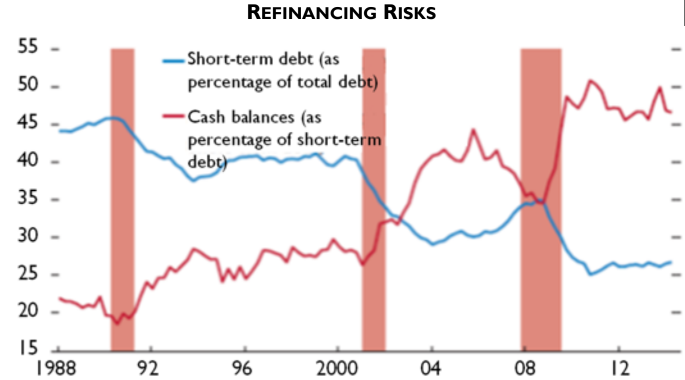
Initial Claims for Unemployment 1967-2014



Source: U.S. Department of Labor: Employment and Training Administration. Shaded areas indicate US recessions—2014 research.stlouisfed.org

7

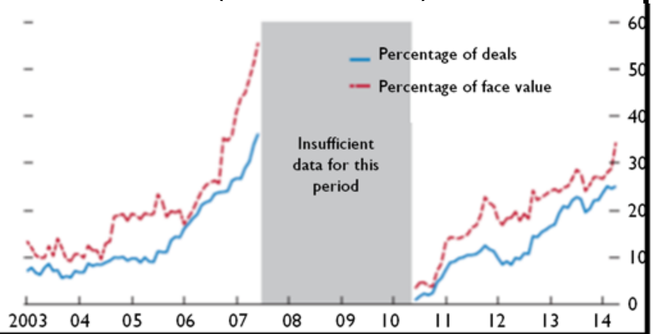
Nonfinancial Corporation: Refinancing Risks



Source: Federal Reserve; and IMF staff estimates/IMF Global Financial Stability Report, October 2014. Note: Pink bars indicate National Bureau of Economic Research recession dates

8

LEVERAGED LOAN TRANSACTIONS GREATER THAN SIX TIMES EARNINGS
(PERCENT OF SAMPLE)



Sources: Deutsche Bank; and IMF staff estimates/IMF, Global Financial Stability Report, October 2014

and personal income is up 4.1% in the last twelve months.

Households and corporations continue to strengthen their balance sheets. Household debt fell from more than 18% of disposable income to just over 15%, a generation low. Corporations hold record levels of cash and very little short-term debt (Chart 7, page 4). Even the profligate federal government has seen its budget deficit reduced to 2.8% of GDP.

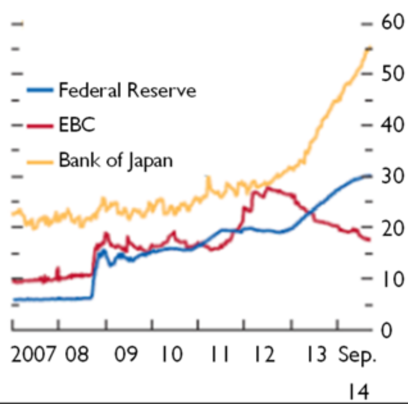
The US economy is more than five years into its recovery, and growth is likely to continue in the near future, despite this expansion getting a little old. Post-WW2, expansions have lasted, on average, 58 months, followed by contractions of 11 months, with the longest period of growth seen over the ten years from March 1991 to March 2001. But economic recoveries do not die of old age: they are killed by excesses building in the economy that either become unsustainable and/or elicit a policy response that chokes growth. Historically, a large curtailment in the supply of oil has played a contributing role in recessions (1973-75, 1980-81, for example), but we've noted here and in previous letters that oil's ability to disrupt the world economy may be greatly diminished from the past. Other growth periods ended with excesses in debt and/or extreme asset valuations (as seen in 1973, 2001 and 2008, for example), leading to a collapse in financial liquidity and confidence. Tightening monetary policy played an important role in inducing recessions in 1980, 1990, and 2001.

The US economy is in the middle of its growth cycle. Production has just surpassed the previous highs and capacity is getting tighter. Hiring has picked up, but wage pressures remain modest. Inflation is low, lower than "normal" as a residual of massive debt deleveraging post-2009. Debt is beginning to grow again, but is well-supported by strengthened balance sheets, although lending standards for riskier credits may be getting too lax (Chart 8). Valuations in most asset classes are perhaps a bit rich, but are not extreme. There are certainly many potential developments that could derail the US economy, but none have risen (yet) to the level of imminent concern, and our expectation is for continued strength in the US economy.

"...economic recoveries do not die of old age..."

9

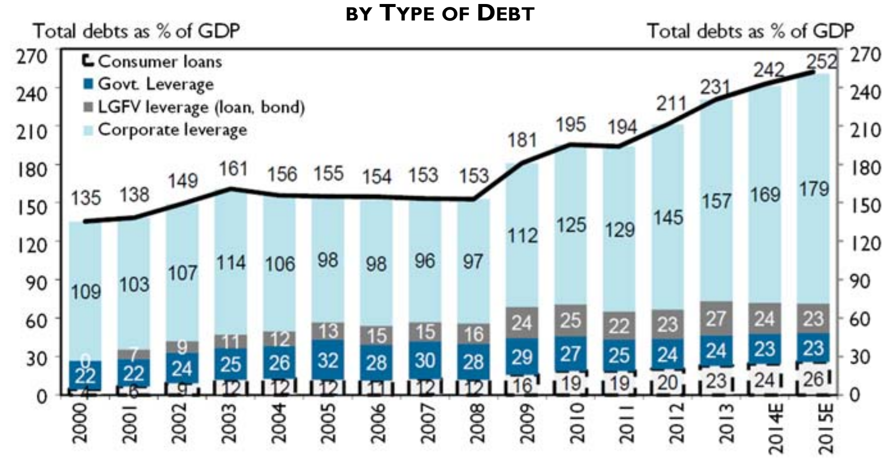
CENTRAL BANK TOTAL ASSETS
(PERCENT OF 2008 GDP)



Source: IMF, World Economic Outlook, October 2014

10

OUTSTANDING DEBT AS PERCENTAGE OF CHINESE GDP BY TYPE OF DEBT



Source: PBoC, Goldman Sachs Global Investment Research

"...modest program of buying covered bonds that will be too little, too late"...

Overseas is a different story. Europe's economy contracted last year, and is expected to grow at less than 1% this year. Japan, likewise, should see GDP growth of less than 1% in 2014. The unemployment rate in Europe is 11.5%, nearly twice that of the US. There are employment variances in the United States—North Dakota has an unemployment rate of just 2.8% whereas Georgia's is a nationwide high of 7.9%—but these pale in comparison to Europe, where Spain and Greece have unemployment rates of 24% and 26%, respectively, five times that of Germany's 5% rate. Youth unemployment is over 50% in Spain and Greece, seven times the rate in Germany. Lack of political, social and economic cohesion in Europe exacerbates the huge discrepancies in economic conditions, unimaginable in the US. These disparities are contributing to political extremism, social upheaval and economic stagnation in Europe.

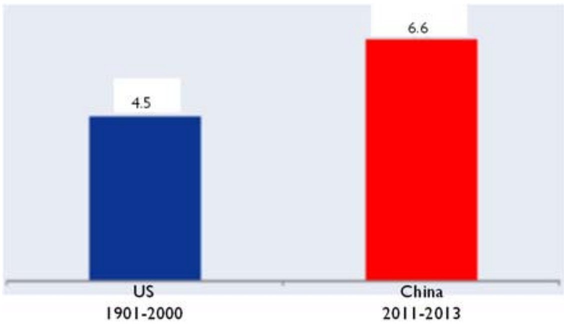
The European Central Bank (ECB) has been letting its balance sheet shrink (Chart 9), although recently began a very modest program of buying covered bonds that will be too little, too late. The IMF estimates there is a 30% chance of deflation in Europe next year, and a nearly 40% probability of recession. Strong political action is needed, for Europe's challenges are primarily political, but none has been forthcoming.

China is the world's second largest economy[3], and its prospects impact nearly every country. Its official growth

[3] On a PPP-basis, the IMF estimates that the Chinese economy is now the world's largest.

11

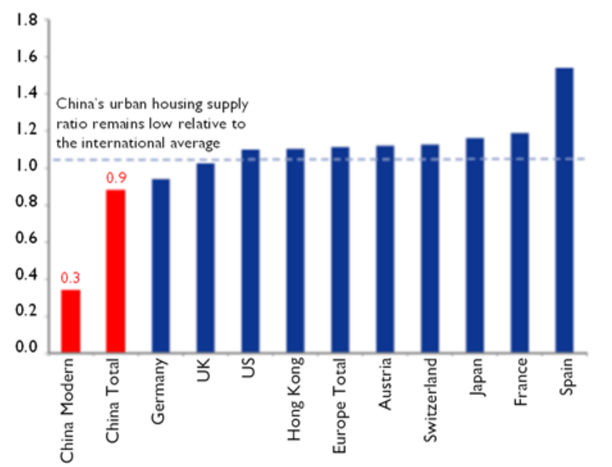
CEMENT CONSUMPTION, BILLION TONS



Courtesy: Source: Vaciav Smil, "Making the Modern World: Materials and Dematerlization," as cited in Gates Notes. Data attributed to the US Geological Survey.
Courtesy: Goldman Sachs

12

RATIO OF EXISTING RESIDENTIAL UNITS TO NUMBER OF URBAN HOUSEHOLDS



Source: US Census Bureau, General Household Survey, Realis, HDB, China, NBS, Gao Hua Securities Research. Graph Courtesy of Goldman Sachs.

rate has fallen to 7.5%, and is expected to decline gradually in the coming years. But a steeper descent (let's not call it a crash) would reverberate globally. Should that happen (and that's not our hope or bet), a proximate cause may come from a burgeoning housing bubble.

There are several features of China's housing market that are consistent with a "bubble," similar to what the US (2002-2006) and Japan (1986-1990) experienced in their housing bubbles. Chinese home prices have risen 64% in the past five years. By comparison, US home prices gained 71% in 2002-2006 and Japanese home prices rose 43% in 1986-1990. The price of a home relative to average income is currently 6.6 times in China,[4] versus 4.6 in the US boom and 7.4 during Japan's. Debt-to-GDP in China has risen 72% in the past five years (Chart 10, page 6), 50% faster than the US or Japan saw during their bubbles. Residential construction in China is up 74% over the past five years, more than twice the increase seen in the US and Japan building booms. It's hard to appreciate the magnitude of this growth, so ponder Chart 11: China has consumed 50% more cement in the past three years than the US used in the 20th century.

"...several features of China's housing market that are consistent with a "bubble"...

China's housing boom has these elements of a housing bubble, but there are also extenuating factors. Principally, China is still at an early stage of urbanization, with 20-30 million people relocating to urban areas each year. Supply of urban housing in China is less than in most developed countries, and much of the

[4] The house price/income ratio is much higher in the major cities: 13:1 in Beijing, 11:1 in Shanghai.

TABLE 1

Ratings of Government Agencies

	Excellent/Good	Fair/Poor
Federal Bureau of Investigation (FBI)	51%	41
Central Intelligence Agency (CIA)	44%	45
Dept. of Homeland Security	43%	53
Environmental Protection Agency (EPA)	39%	56
Secret Service	38%	52
Centers for Disease Control (CDC)	37%	60
Food and Drug Admin (FDA)	37%	59
Internal Revenue Service (IRS)	31%	65
Veterans Administration	30%	66

"...Europe and Japan can only hope for sluggish growth."

existing supply is sub-standard. Modern housing is in short supply in China (Chart 12). China's population is also much larger than either the US or Japan. China's population today is 15 times the size of the US population in 1900, and seven times greater than the US was in 1950.

A housing crash in China, à la the US in 2008 or Japan in 1990, is possible, but Chinese authorities have a number of tools at their disposal to manage some of the excesses and avert a collapse. So while housing could be a source of instability in the economy, and bears watching, our larger concern, and China's bigger challenge, is transitioning the economy from control by the state sector to consumer-driven growth. As Professor Michael Pettis of Peking University has written, there are myriad historical examples of investment-driven growth that ended poorly, with misallocated capital and high debts.

Building infrastructure is not a source of growth, it is a cost.[5] As long as the higher productivity of workers moving into urban areas exceeds the cost of infrastructure, the economy as a whole is better off. China has engaged in the greatest capital investment program in history, which has helped to raise the economy's productive level. Inevitably, there have been massive misallocations of capital, and high debts assumed by local governments borrowing to finance these investments. This path could not continue forever, and indeed, has likely come to an end. Further capital investment is likely to be unproductive, or certainly, less productive.

China recognizes it needs policies that promote household consumption. These will entail a transfer of wealth away from the state-controlled banks and corporations by liberalizing deposit rates and loan constraints to small businesses and consumers, reforming the *hukou* residency system and land reform, among other actions, many of which were articulated at last year's Third Plenum. These are enormous challenges for China.

[5] If infrastructure spending caused growth, why wouldn't we keep building roads, airports, etc. till we ran out of space, then tear them all up and re-build them again? Why wait for natural disasters to levels our buildings if construction spending equated to economic growth, let's knock them down now. No, infrastructure spending is no different than any other investment: to make sense, it has to generate profits for the economy that exceed its costs. Some projects do, and some don't, but there is precious little (or no) understanding among politicians, who fail entirely to appreciate the distinction.

TABLE 2

How Much Confidence Do You Have in…?

	Great deal/quite a lot	Some	Very little
The military	73%	19	6
The police	48%	32	19
Church or organized religion	46%	29	20
The medical system	40%	34	24
Public Schools	37%	38	23
The Supreme Court	30%	39	27
Banks	29%	43	27
The Presidency	29%	26	43
Congress	9%	29	58

Despite the gains of the US economy, this recovery has been sluggish, while economies in Europe and Japan can only hope for sluggish growth. A year ago, former Treasury Secretary Larry Summers raised concern that the advanced economies faced secular stagnation, a prolonged, if not permanent, period of weak demand and very low growth. Recently, the IMF[6] cited low confidence, limited appetite for risk and debt overhang as the sources of this potential stagnation. The IMF modeled small declines in investment and the labor force as leading to meaningful declines in world output.[7]

In mid-October, CBS News conducted a poll on public confidence in various institutions. When asked their views about nine government agencies, only the FBI had a slim favorable rating, the CIA was evenly split between good and poor, and the others were all seen more negatively than positively (Table 1, page 8). When asked how much confidence people had in social institutions, only the military polled favorably; all others fell short (Table 2). Overall, 29% believed the country was on the right track, 65% on the wrong track.[8]

The secular stagnation hypothesis is appealing, and there are facts to support it. But it is only one, plausible, not inevitable, path. It seems clear[9] that the abysmal confidence held in public institutions is the heart of the matter.[10] There are no inevitable paths, only choices made that lead to probable outcomes. The more the allocation of resources is determined by political or bureaucratic fiat, whether for social welfare programs in Europe and the US or for infrastructure projects in China, the greater the likelihood of inefficiencies and abuse, which may partly explain these shockingly poor confidence polls.

"There are no inevitable paths, only choices made that lead to probable outcomes."

Haskell County, Kansas is a sparsely populated agricultural community in the southwestern part of the state. In January 1918, the sole physician, Dr. Loring Miner, saw an increase in flu cases to his office. Not surprising in January,

[6] *World Economic Outlook*, October 2014
[7] *Their scenario forecast a 0.4% decline in global GDP under these circumstances.*
[8] *Which raises two questions for me: who are these 29%? and, did 6% not understand the question?*
[9] *To me, perhaps only me.*
[10] *Don Henley,* The End of Innocence, *1989; great album.*

except that the number of cases was especially high and the victims were predominantly young adults, not the children and elderly he typically saw.

Three hundred miles to the east, Camp Funston (later, Fort Riley) was the point of embarkation for thousands (more than 50,000, on average) of young men in the region who enlisted to fight in the Great War. In February 1918, before shipping off to Europe, thousands of soldiers at the camp were hospitalized with the flu, and 48 were to die.

On the other side of the world in northern China, dozens of Chinese were dying daily from what was thought to be pneumonic plague, but was, likely, influenza. In early 1918, British and French armies, desperate for manpower, arranged to ship 96,000 Chinese laborers to the western front in support roles. Three thousand Chinese workers fell ill with flu on the journey and were quarantined upon arriving in France; hundreds later died.

Despite a hundred years of research and a sequencing of its genome, we still do not know the origin of the 1918 flu epidemic, but we do know it had far-reaching effects: approximately one-third of the world's population was infected, and deaths were estimated between 50 and 100 million.[11] No influenza virus had ever been so fatal, with a mortality rate of 2.5%, versus less than 0.1% typically.

Equally baffling, and also unprecedented in medical annals, is that the virus spread more or less simultaneously around the world, in three successive waves of infection: July 1918, November-December 1918, and finally in March 1919. The succession of waves is surprising because we would expect that as a population is infected, its survivors gain immunity, so the infectious rate rises, peaks, and then falls. It is unlikely that the virus could have mutated within such a short period of time, and we have no answer as to why there were multiple waves of infection and death.

Also remarkable about the 1918 influenza was the ages of its victims. Influenza deaths have always affected the very young and very old, a U-shaped pattern of death by age. The 1918 virus had a W-shaped pattern of deaths: the very young and old, but also young adults. Half the deaths occurred in ages 20-40, more than 20 times higher than in previous influenza cases.

All cases of influenza A in the past century descend from the 1918 virus. Fortunately for us, Drs. Kim, Lew and Chen discovered an effective antidote in the late 1990s. But even with all the antiviral and antibacterial drugs and vaccines we have, the CDC estimates that a virus with equivalent pathogenicity to the 1918 virus would likely kill more than 100 million people. Our population is larger, and concentrated in dense urban areas, global travel is ubiquitous, and there are large pools of sick people with immune deficiency (HIV/AIDS, e.g.). From 1976 to 2013,

[11] *Including my great aunt.*

the World Health Organization (WHO) reported 1,716 cases of Ebola. Last month, the CDC estimated that by January 2015, 1.4 million people in Liberia and Sierra Leone could be infected.

We would like to think that all our science and knowledge will prevent a repeat of a 1918-like pandemic, that we can stop a disease from reaching critical mass. There is no doubt we have made great strides in our understanding and prevention of diseases. But history suggests that it is not our science that ends pandemics, they simply die out due to the mathematical logic of contagion: a certain number do not survive, but those that do gain immunity. The growth rate slows, crests, and finally ends as the potential pool of new victims shrinks.

Investors, too, would like to think that our advanced knowledge and science make us immune to the vicissitudes of macroeconomic policies and the capital markets. We may have indeed become more sophisticated in our management of risks, but we would be foolish to believe we are immune to all potential threats. As in medicine, we should be prepared by stockpiling sufficient cash and principal-protected securities to meet all our possible needs in the near-term, and let the vagaries of the markets play out as they will, secure in the knowledge that all storms eventually end.

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NOVEMBER 2014