Economic & Financial Market Outlook

Fiscal Year 2017-2018

Staff Note: *This document serves as an input to asset allocation thoughts and the prefunding plan. In prior years, staff's views were incorporated into an annual Work Plan that was presented near the beginning of the fiscal year and updated mid-fiscal year. With the goal of more cleanly splitting staff's economic and financial market views from staff's operational goals for the fiscal year, the former Work Plan will now be broken into an Economic & Financial Market Outlook, which will still be updated no less frequently than semi-annually, and a Project & Deliverables Calendar, which will provide insight into near-term recommendations and implementation goals.*

Global Themes

Over the coming years, certain global themes will influence whether the economic environment will be described by high or low real growth and high or low inflation. The themes are multi-year, non-linear in potential outcomes, and somewhat interdependent. Nevertheless, staff boldly attempt to handicap how these themes might impact global growth and inflation.

Deglobalization / Populism

This theme encapsulates the unraveling of the trend toward globalized production and commerce. Several factors have converged to displace middle class / industrial workers in developed economies, including automation, austerity measures post-financial crisis in the Eurozone, and labor cost differentials in developed versus emerging markets. The resulting disruption has led to a rise in various nationalist movements (America first, Brexit, French National Front) and increased protectionist sentiment. Likely impacts include slower global growth due to decreased international trade flows; possibilities also include unwinding of global trade agreements, and disintegration of the European Union.

Geopolitical Risk

This theme addresses the seemingly increased number and intensity of global hotspots, including North Korea (China, Japan, North Korea, South Korea, US), the South China Sea (Vietnam, Philippines, China, US), Mid-East proxy wars and refugee crisis (Iran, Saudi Arabia, Russia, Turkey, Syria, Afghanistan, US), and Eastern Europe (NATO, Ukraine, Russia, US). Even in the absence of actual armed conflict, any rise in tension and uncertainty will be detrimental to the global economy. Likely impacts include slower global growth due to mercantilist policies, increased energy price volatility, and the weaponization of trade.

Trumponomics

This theme considers President Trump's ambitious agenda for economic policy and unconventional approach to public policy. With the prioritization of tax reform and oft-promised large scale infrastructure investment, there is ample fodder for increased business confidence, capital spending, and positive influences on economic growth in nominal dollar terms. Policy decisions regarding mobility of labor capital, free trade, and other elements of deglobalization bring into question whether nominal growth would translate into higher real growth, higher inflation, or both. Manifestation of President Trump's ideas are a prerequisite to any true economic impact.

Emerging Markets' Rising Middle Class

This theme captures the impact of rapid economic development across the emerging markets creating a growing middle class. This segment of the population has rising per-capita incomes and increasing propensity to consume goods and other resources. The emerging markets' middle class is a key driver in global economic growth and represents an opportunity for revenue growth-starved corporations to generate both revenue and earnings growth by tapping new markets. Unchecked, this growth could lead to uncontrolled inflation in a resource-constrained world. Another consequence of the rising emerging markets' share of world GDP is growing economic, political, and social influence for this group.

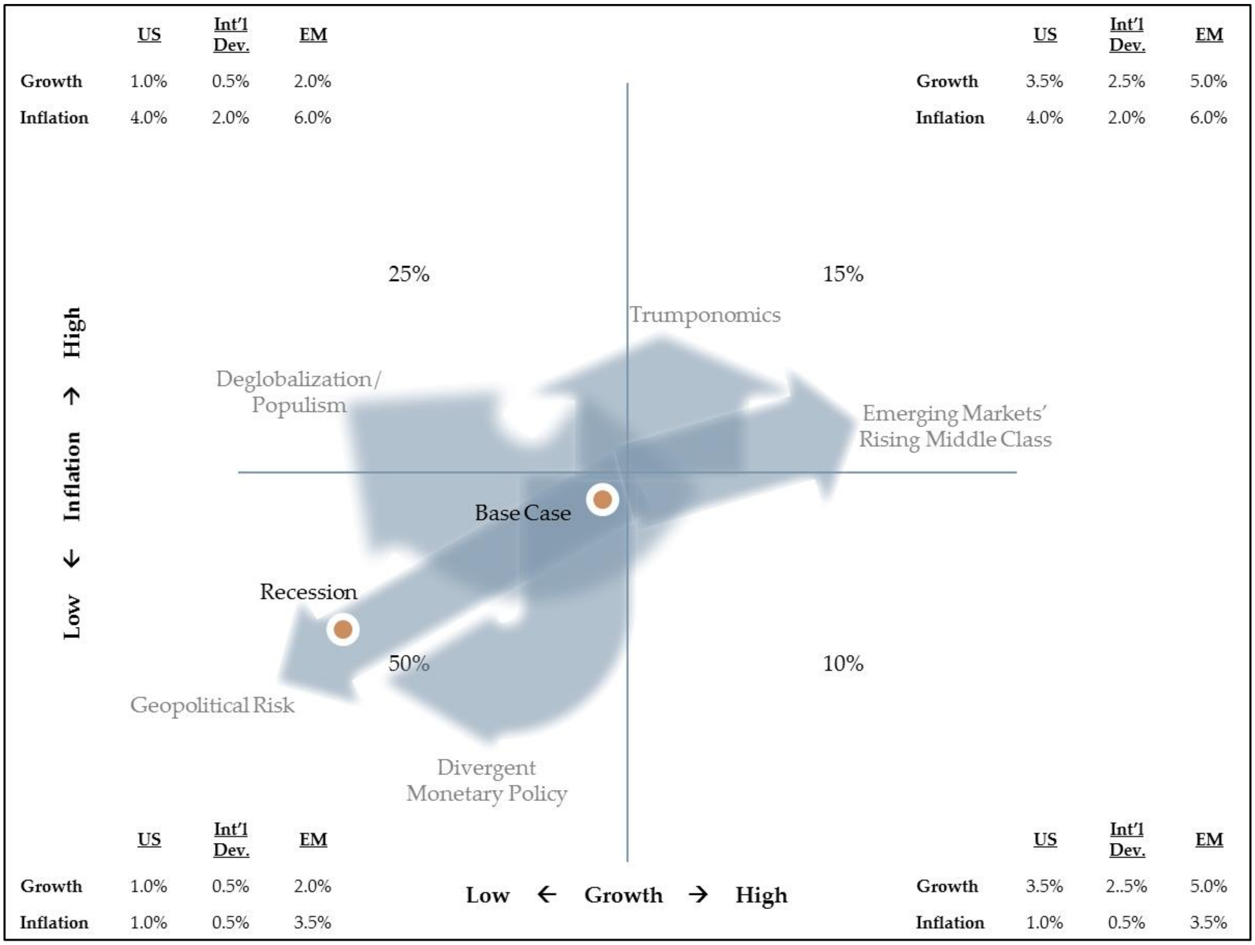
Divergent Monetary Policy

This theme is focused on the unwind of coordinated monetary policy actions of the world's key central banks following the financial crisis. Differing levels of recovery in growth, employment, and stable inflation suggest divergence in monetary policy, as the pace of normalization is region-specific. The Federal Reserve has already begun tightening, while the European Central Bank has only started to consider future tapering of asset purchases and the Bank of Japan is firmly pegging long-term rates at zero. If policy divergence occurs faster than expected, the US dollar could strengthen significantly. However, if divergence contracts due to improving global growth and inflation, the US dollar could weaken while risk assets generate higher returns.

Economic Outlook

Longer term headwinds to improved real economic growth pervade the global themes; that backdrop, and the lack of a clear near-term catalyst for higher growth, directs staff's base case view of low growth. Similarly, artificial supply-side inflationary forces present in the themes are likely to be realized only over the mid- to long-term, biasing staff toward a low inflation environment as well. There could be, however, a near-term shock that could drive the global economy into a recession, causing staff to bifurcate the low-growth, low-inflation outlook into two distinct scenarios. Exhibit 1 shows how staff translates the forces of the global themes into probabilities of growth / inflation relative to current levels.

Exhibit 1: Growth / Inflation States-of-the-World Probability Matrix



Each of the global themes is effectively a vector with many degrees of uncertainty. In the near term, deglobalization and populism are likely deflationary and contractionary forces, though over the longer term it could prove stagflationary. The US variant, Trumponomics, may or may not be growth positive, but it is undoubtedly inflationary (if the President's priorities get implemented). These forces can be contrasted with the long term rise of the emerging markets' middle class, which should provide a moderate growth impulse with a slight inflationary bias. Geopolitical risk continues to cast a shadow over the global economic environment. Like Trumponomics, geopolitical risk is an ex-ante situation, whose realization could be a strong disinflationary and recessionary catalyst. Almost completely divorced from the longer term themes, divergence in monetary policy is virtually guaranteed to have a near term impact, as well documented central bank plans reflect individual country conditions. With the influence of US monetary policy becoming less accommodative, the theme is a disinflationary one, if not negative for real growth.

Perspective on US Growth and Inflation

With the US business cycle (through June 2017) having completed its 98th month of expansion[1], the topic of time horizon becomes critical for communicating economic forecasts and related investment expectations. Staff attempts to mitigate false confidence around forecasts by using descriptive rather than numerical terms. At the same time, what is meant to facilitate conceptual understanding runs the risk of undermining the severity of the statement. Therefore, to put the spotlight on the reality of macroeconomics, staff puts forth the following: **Staff believe that there is a 10% probability of a US recession in the next 12 months, but >50% probability of a US recession in the next 36 months.**[2] The contrast strongly colors staff's financial market outlook, and the distinction between the 1-year and 3-year horizon clearly becomes critical for allocation decisions.

Why would it be so clear that recession lies in wait? After all, the oft-stated "economic expansions do not die of old age," is quite true. The real growth rate is a linear combination of the growth rate in capital, the growth rate in labor, and total factor productivity. Furthermore, the nominal growth rate equals the real growth rate plus the rate of inflation. Given those, there are four subjects to evaluate: "capital", "labor", "total factor productivity", and "inflation". Considering these in the present context provides some confidence both in near term projections and the range of uncertainty in the longer term future economic environment.

Today, there remains excess slack in capital. Total industry capacity utilization is several percentage points below pre-crisis levels and even further below historical averages. Financing is still readily available on favorable terms relative to historical standards. However, financial conditions are clearly intentioned toward becoming less accommodative. The impact of future confidence cannot be overstated. The election of President Trump sparked hope of increased capital deployment (e.g. infrastructure spending) and a favorable tax and regulatory environment (which could result in better return on

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[1] The longest expansions in US history were February 1961-December 1969 (106 months) and March 1991-March 2001 (120 months). *Source: NBER*

[2] Staff is not alone in its view. Just a few days after staff drafted this sentence, PIMCO Global Economic Advisor Joachim Fels wrote (https://www.pimco.com/en-us/insights/economic-and-market-commentary/macro-perspectives/the-next-recession/):

> *Our models put the probability [of a recession over the next six- to 12-months] at less than 10%....If history is any guide, we believe the probability of a global recession sometime in the next five years is around 70%.*

In their June 16, 2017 Global Investment Strategy Weekly Report, BCA Research (www.bcaresearch.com) succinctly summarized a shared view:

> *Right now, our recession timing model, as well as the models maintained by various regional Fed banks, assign a low probability of a severe slowdown in the coming months. These models, however, tend to send reliable signals only over a fairly short horizon. Looking further ahead, we see a heightened probability of weaker growth in the second half of 2018, which could set the stage for a recession in 2019. The good news is that today's economic imbalances are not as daunting as they were in the late innings of many past economic expansions. Thus, the 2019 recession is not likely to be especially severe. The bad news is that valuations across most markets are quite stretched.*

investment and potentially increase aggregate demand). While the hope was clearly visible in equity markets, it is important not to confuse markets with the real economy. The so-called "soft data" pointed to a potential increase in the rate of capital investment, but the hard data (simplistically, quantitative measures rather than opinion surveys) has not followed through. More recently, both hard and soft data has drifted in a less favorable direction. A favorable turn in capital use is the biggest risk to staff's view, and is well-captured in the themes of Trumponomics.

Labor is the easiest of the items to understand, as the media frequently report the many measures of jobs growth/availability, unemployment/underemployment, and wage growth. Continuing to focus on the US, growth in the rate of labor use is constrained by the current low levels of unemployment, although broader measure of unemployment indicates more slacks. Potential increase in labor utilization could be inflationary, which would likely be countered by Federal Reserve action. In turn, Federal Reserve action would limit growth in labor utilization, the growth rate of capital investment, or some combination, thereby limiting increases in the overall real growth rate.

The current state of monetary policy is an additional consideration to the Federal Reserve's reaction function. The current target Federal funds rate is 1.00-1.25%. There is a soft floor around 0%, the perceived neutral rate is around 3%, and there is no theoretical cap. All of this to say the Federal Reserve has more room to fight inflation than recession. That situation is relevant to the glide path that the Federal Reserve must choose. If the Federal Reserve were to let inflation get ahead of the comfort zone, with inflation expectations un-anchoring, they would need to react more aggressively to prevent inflation from gathering steam. Such an interest rate shock would likely force a recession. Therefore, to avoid causing a recession, the Federal Reserve should temper the economy slowly but still sooner than apparently necessary. To summarize the issue of potential growth in labor input as a driver of higher real economic growth, and to address staff's view on inflation, both are likely capped by the Federal Reserve's efforts to avoid policy error.

Finally, there is the residual issue of productivity. The concept is that certain combinations of capital and labor produce greater levels of output than would be achieved by the sum of their independent utilization (i.e. 1+1=3). Productivity is not directly observable, but the most intuitive assignment of causation for changes in productivity is technology. Technological enhancements tend to enhance output per unit of capital and/or per unit of labor. Thus, the current low growth of productivity often leads to naysaying about the value of recent technological enhancements (or complaints about the shortcomings of economic data measurement).

Staff takes a longer term view when considering productivity enhancement due to technological development. Over the post-World War II period, US productivity has remained stable. There have been few periods of surprisingly rapid productivity growth (such as the late 1990s). While the average level of productivity growth has been depressed post-crisis, so has the volatility of productivity growth.

Technological adoption is slow, but there is another feature of productivity that has been present since 1980. During a recession, productivity initially drops (output drops while input is unchanged) then reverses (generally, labor input drops while output stabilizes). The key is that coming out of a recession, there seems to be pervasiveness in the heightened rate of productivity growth. It would be a rational explanation that the challenges of a recession cause businesses to take smarter risks to enhance competiveness, which subsequently results in a cycle of productivity enhancement.

Coming out of the financial crisis, businesses benefitted from historic monetary easing and low interest rates. Instead of improving competitiveness, businesses changed their capital structures and entrenched their position, taking less risk. As evidence, consider the anemic levels of gross private domestic business investment.

The takeaway from this analysis of productivity is that change in the growth rate of productivity cannot, in the near-term, be expected to materially impact real growth. Over the long term, it would be entirely unsurprising if further applications of big data and artificial intelligence change the way people live their lives. The implications could be stimulative to growth, detrimental to economic equality, or both. These consequences play into the theme of deglobalization/populism. Technological adoption occurring at a meaningful level, may likely require that the US first need to weather a recession.

International Perspective

In isolation, the US growth and inflation dynamics are challenged, but international factors add additional layers of risk that both pervade staff's themes and shade probabilities within the Growth/Inflation States-of-the-World Probability Matrix.

As the world's second-largest economy, China occupies an awkward position for international investors. While clearly impactful at the global level, language, culture, and governmental policies all prevent the degree of transparency present in most Western developed markets. Investors must operate with limited access to information and with a heightened awareness that "you don't know what you don't know."

What is clear is that debt creation in China has been an explosive catalyst in hitting the internal real growth targets that are part of the government's explicit objectives and serve the primary purpose of maintaining social stability. Debt levels appear tenuous, and it is commonly believed the only way to maintain a glide path into a lower and sustainable long-term growth rate is to gravitate to an economy driven by internal consumption rather than exports and capital investment.

So far, the government's attempt to pull back on credit growth has been imperfectly implemented. The first reduction sparked concerns about a China hard landing, reverberating through financial markets. Immediately, China eased financial conditions and started implementing resistance in credit growth via subtler channels. Even a successful soft landing would likely be punctuated by unpredictable, short-term market reactions. As China takes a more active role in the global balance of power, geopolitics add a layer of complexity that keeps staff very wary.

In the locales assumed to be more predictable, a funny thing happened on the way to the Brexit. Just as the intial referendum for the United Kingdom to leave the European Union took markets by surprise, the British voters once again foiled politicians and pundits alike, effectively rejecting Prime Minister Theresa May's objective of a clear mandate to negotiate a hard Brexit. The additional uncertainty means one of the few countries perceived as being along similar monetary policy timelines as the Federal Reserve is no longer a given. As the steep depreciation of GBP versus USD post-election demonstrates, divergent monetary policy continues to be a theme that will impact global growth and inflation, as well as financial market results.

Financial Market Outlook

Given staff's relatively benign view of the near-term economic climate and the current state of valuations, expectations of financial market returns are muted. While sentiment/technical factors may drive returns over the short term, their unpredictable nature and timing dictates that they be addressed only in a more immediate fashion. Exhibit 2 illustrates staff's asset class views on a 5-point scale {++, +, o, -, --} and asset class-specific commentary follows.

Exhibit 2: Near-term Asset Class Risk-Adjusted Return Ratings

Asset Class	Rating
Cash	++
Global Equity	--
Global Fixed Income	o
Real Assets (public)	o
Absolute Return	+
GTAA/Opportunistic	-
Private Equity	o
Private Debt	o
Private Real Assets	o

Cash

With rising short-term interest rates, cash has become increasingly attractive on a risk-adjusted basis, not just as a volatility dampener and liquidity pool. Cash-like investments can now reasonably earn 1% over the near term, with very little possibility of earning less than that. Furthermore, if it were to earn less than 1%, it would be in an environment where risk assets drop precipitously, enabling deployment into risk assets at more favorable valuations. If staff's base case plays out, cash-like investments will benefit from rising interest rates. No other asset class currently provides the certainty of a positive return and the liquidity for opportune deployment to higher yielding assets. This favorable optionality makes cash staff's highest conviction asset class in the near-term.

Global Equity

Global equities have performed strongly, with MSCI ACWI IMI up nearly 19% fiscal YTD at May month-end. Emerging Markets led the charge, outperforming Domestic Markets by over 5%, with International Developed Markets splitting the difference. The performance was sparked by US election results, and a subsequent "risk on" rally that ran through Q1 2017. The Plans have benefitted from the tactical regional positioning of the allocation given the relative regional returns, although the allocation to equity long/short strategies has been a headwind in the face of the strong absolute performance of global equities.

The strong performance in equities was driven by some underlying earnings growth, particularly in international markets, but largely by multiple expansion, especially in the US. Longer term valuation metrics continue to show Domestic Markets as very overvalued, with International Developed and Emerging Markets now both within one standard deviation of average. Shorter term valuation metrics paint more muted pictures, although most metrics that use forward looking earnings estimates show markets as overvalued.

Staff's short term expectations for global equities reflect the elevated valuations and assume some level of mean reversion. Of course, domestic equities were expensive before they rose 19% this past fiscal year, so clearly in the short term, valuations and mean reversion are imperfect. To assume that equities continue to perform well, an investor must believe in some combination of increasing valuations, increasing earnings, and/or decreasing discount rates. In the US, valuations are high, growth is low (and margins are already at 30-year highs), and discount rates are rising. There is more room for appreciation outside of the US, which is reflected in staff's ongoing tactical regional positioning, but the outlook for global equities is not optimistic.

Global Fixed Income

Consistent with staff's FY2016-2017 Work Plan, the Global Fixed Income benchmark returned approximately 0% for the fiscal year (through the beginning of June). As developed market rates eased off their December highs, and the credit risk asset rally that began in February 2016 continued, the second half of the fiscal year erased the -4.8% benchmark return noted in the FY2016-2017 Work Plan Update.

For FY2017-2018, it is staff's view that valuation and fundamental indicators will not be the drivers of returns for fixed income. Instead, markets are heading to a more binary state: either things shall plod along their current path – and this should be the assumed direction – or fear grips the markets and assets trade in the direction of valuation and fundamentals, but overshoot.

Currently, fixed income asset valuations are rich, but not so rich as to be terribly worrisome. At the same time, fundamentals are deteriorating, but not so blatantly as to sound an alarm. Liquidity, currently robust, will evaporate if worry and alarm hit the market, driving returns into negative territory.

The timing of such an event will dictate the true fiscal year returns. Being that such an event cannot be predicted with any degree of precision, there is little choice but to think the current situation will continue for some time, and benchmark returns for FY2017-2018 will again be slightly negative to slightly positive.

<u>Global Core</u>

As the business cycle extends and US monetary tightening continues in earnest, the sectors within the global core sub-asset class will behave very differently. In staff's base case scenario, US Treasuries and US investment grade corporate bonds should have the worst performance. However, these sectors do have a current yield advantage over non-US securities, and US Treasuries provide some protection in a flight-to-quality environment. As the Federal Reserve begins to taper its balance sheet, rising interest rates and increased supply could overwhelm positive home price appreciation and strong consumer balance sheets, making agency mortgage-backed securities unattractive. Out-of-benchmark securities such as credit risk transfer can provide greater sensitivity to strong fundamentals without the same headwind, at a cost of higher perceived volatility and lower liquidity.

Non-Investment Grade Credit

If the market interprets every credit event as idiosyncratic rather than structural, then the credit cycle will deflate rather than implode. Trouble with energy and shipping has given way to trouble with retail and power. Imminent issues in pharmaceuticals, automotive, and telecommunication have started to show, at least at the issuer-specific level. The market has responded with little more than a shrug – both bank loan and high yield bond indices trade above par. It is hard to recommend an underweight to a sub-asset class that carries several hundred basis points higher than others, but it is reasonable to think there will be episodic spread widening to provide a better opportunity set.

Emerging Market Debt

High current yields and the ability to diversify risk (whether commodity-driven, political, or otherwise) makes emerging market debt relatively attractive. With strong economic and monetary fundamentals compared to developed markets, and a large positive carry advantage, emerging markets should continue to see support from inflows as the relentless search for yield continues. Aside from side-effects of developed market policy (i.e. potential USD strengthening), the biggest headwind to emerging markets broadly is a full calendar of political events over the coming year. The potential for large policy shifts within emerging markets could unhinge investor confidence and subdue the asset flow that has driven performance over the past eighteen months.

Real Assets (public)

Real assets (Infrastructure, Commodities, Natural Resources – the Plans' Real Estate investments are private structures) performance improved in FY2016-17 with the continued return of inflation from 2015 lows. Staff's low growth / low inflation base case precludes further optimism with regards to expected future performance, although there are potential tailwinds, including continued EM economic growth. Headwinds include continued low oil prices, and potential USD strength. The Plans' infrastructure and natural resource implementations through equity indices exposes the allocations to rising equity valuations, though energy and materials in particular continue to trade at a discount to the broader market despite the recent rally.

Absolute Return

Given staff's views of fundamentals and valuation, low-beta high-alpha absolute returns strategies are attractive. Cross asset correlations are low, while dispersion is high, a favorable environment for relative value absolute return strategies, which benefit from relative pricing of securities versus broad market moves. Although, the low volatility environment and current environment of central bank policy regimes, has been difficult for many macro strategies to navigate. Normalization of central bank policy should create a more favorable environment for macro, and episodic bouts of volatility should create attractive trading opportunities. Staff continues to believe the absolute return program is attractively positioned relative to most asset classes, and the allocation to absolute return remains above the policy target, but within the policy range. The absolute return program has produced low single digit returns, outperforming the aggregate plan level return for two of the past three fiscal years. The most recent fiscal year saw unexpected strength in market returns including equities, thus absolute return underperformed the aggregate plan level return, although we think continued broad market strength is unlikely. We continue to prefer defensive and hedged positioning, with potential upside through alpha generation, and exposure to unique risk factors (execution, operational, and leverage).

GTAA/Opportunistic

GTAA strategies are multi-asset portfolios, thus expectations for GTAA are a culmination of staff's views across all markets, combined with a view on a GTAA investment manager's ability to navigate the environment, add value through tactical decisions, relative value positions, or short positions. Generally, staff's views on GTAA are muted, although the GTAA program's current GTAA program has some embedded value due to positioning in emerging market assets. That said, absolute return is favored over both traditional betas and over GTAA.

Private Investments

Given the timeline and strategy of private investments, the economic and financial market outlook is slightly less relevant. That said, public markets still impact private market dynamics. Asset owners continue to increase allocations to private markets to meet return targets, increasing competition for space in the funds of the best investment managers. The balance of power between general partners and limited partners decidedly rests with the GP. The availability of capital has also impacted what assets get funded. Valuations on the highest quality assets have soared. Assets that would not get funded in normal environments now get funded, albeit at lower valuations, making overall private asset valuations lower than public markets, while the illiquidity premium for comparable assets in public and private markets has compressed substantially.