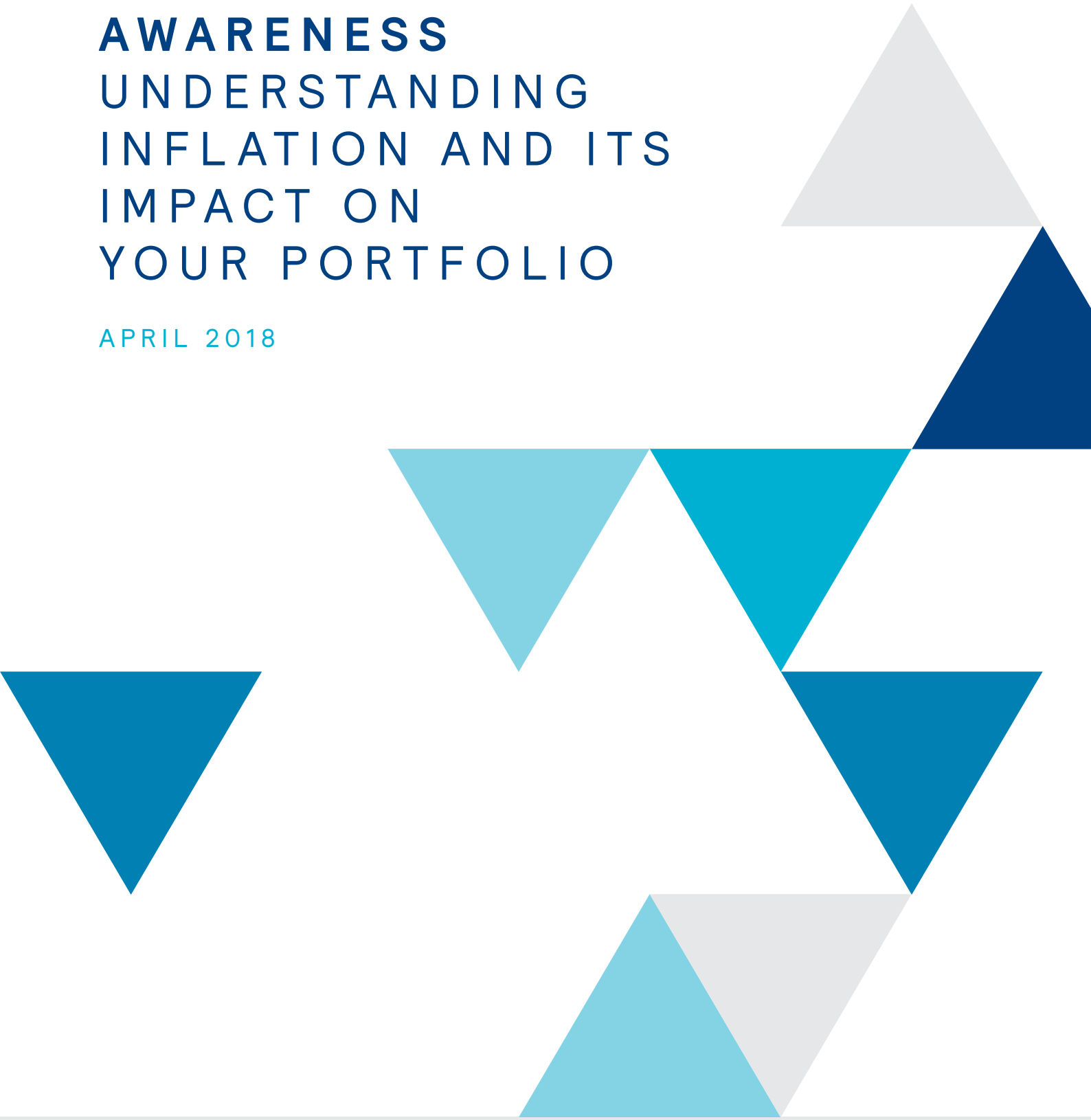
HEALTH WEALTH CAREER

INFLATION AWARENESS

UNDERSTANDING INFLATION AND ITS IMPACT ON YOUR PORTFOLIO

APRIL 2018



INTRODUCTION

"Inflation is when you pay fifteen dollars for the ten-dollar haircut you used to get for five dollars when you had hair."

— Sam Ewing, All-American Baseball Player

Inflation in the period following the financial crisis has been notably weak across the developed world, with central bankers' unconventional monetary stimulus having had a relatively limited impact on the prices of goods and services. This extends an already long period of moderate inflation in developed economies since the early 1990s. Powerful disinflationary forces in recent decades have included the expansion of the global labor force, technological improvements, reduced trade barriers, a weakening of the power of organized labor (unions) and explicit inflation targeting by increasingly independent central banks.

Although some of these factors (for example, the impact of technology) will continue to exert a disinflationary force on the world economy, others will be less important in the future. At the same time, cyclical inflationary forces are emerging in a number of developed economies, leading central bankers to gradually rein in their stimulus and shift toward a tightening bias. Against this evolving backdrop, this paper covers the history and drivers of inflation, provides a forward-looking assessment of inflation risks in the current environment and considers the ways in which investors can manage inflation risk within their portfolios.

A BRIEF HISTORY OF INFLATION

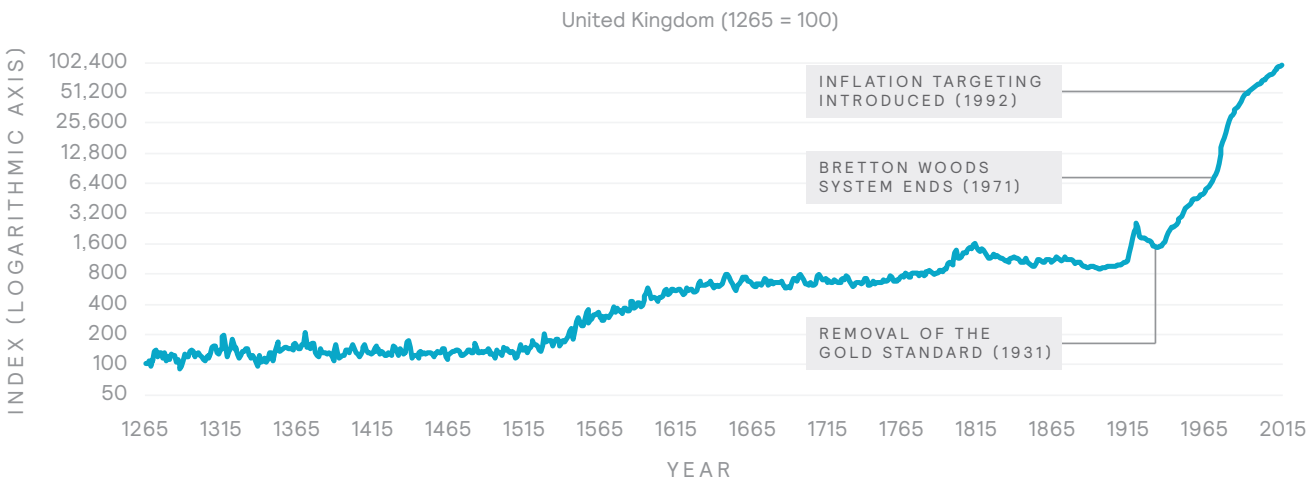
There were nearly as many periods of deflation as there were inflation until the 20th century.

Inflation and deflation have been around for as long as goods and services have been traded, and the long-term historical record shows that there were nearly as many periods of deflation as there were inflation until the 20th century, when inflation began to dominate. There are many potential explanations for this relatively recent dominance of inflation; however, the growth of the banking industry and the accompanying growth in credit availability, as well as the end of the gold standard, are likely to have played major roles.

Even more recently, inflation has not only been consistently positive, but it has also been highly stable — all but one (South Africa) of the 19 countries considered in an analysis by Dimson, Marsh and Staunton[1] experienced positive inflation below 6% in every year between 1992 and 2011.

Periods of hyperinflation, defined as monthly inflation rates in excess of 50%, are a rare phenomenon, but also a fairly modern one, with just one episode recorded before the 20th century (France, 1796), 54 episodes during the 20th century and one since (Zimbabwe, 2008).[2]

Figure 1 – Cumulative Inflation Index



Source: Williamson SH. "Annual Inflation Rates in the United States, 1775–2017, and United Kingdom, 1265–2017." MeasuringWorth, 2018. A logarithmic axis has been used to ensure proportionate increases are scaled consistently. This means that a doubling of the index (a halving of the purchasing power of money), whether from 100 to 200 or 1,000 to 2,000, will appear the same size.

[1] Dimson E, Marsh P, Staunton M. "The Real Value of Money," *Credit Suisse Global Investment Returns Yearbook 2012*.

[2] Hanke SH, Krus N. *World Hyperinflations*, Cato Working Paper, 2012.

WHAT DRIVES INFLATION?

Inflation is a complex phenomenon driven by many interacting forces within an economy. Some of these relationships are quite well understood, others less so.[3] Below we list, by no means exhaustively, some of the structural and cyclical drivers of inflation and provide some detail on how these drivers may influence prices.

STRUCTURAL DRIVERS

Demographics: There is a lively academic debate surrounding the influence of demographic pressures on interest rates and inflation. One compelling argument, explored in depth in a recent paper by the Bank for International Settlements,[4] centers around the supply and demand for goods and services. In simple terms, the argument is that children and retirees contribute only to the demand for goods (via consumption), whereas the working-age population contributes to both the demand and the supply of goods (via consumption and production of goods). The dependent population (children and retirees) therefore provides an inflationary impulse to the economy, whereas the working-age population will tend to be a disinflationary force (since its production tends to exceed its consumption).

The argument follows that with relatively stable consumption preferences, any reduction in the size of the working-age population relative to the dependent population (that is, a rising dependency ratio) has an inflationary effect.[5]

Globalization: Globalization has been a disinflationary force for most of the developed world over the past few decades, as it has opened up cheaper labor markets in emerging economies, exerting downward pressure on prices and wages in developed economies. At the same time, there has been a structural decline in the power of organized labor (unions) within developed economies, tilting the balance of power away from labor and toward the owners of capital (evidenced by the upward trend in profits and downward trend in wages as a proportion of GDP). Increased trade flows have also increased the degree of competition within the global economy and thereby acted as a downward force on inflation.

Technology: Technological advancements and automation are generally associated with reducing costs of production and therefore exert a disinflationary pressure on the global economy. In simple terms, this will tend to reduce the pricing power of workers and decrease the price of goods in the same way as cheap labor in emerging economies

[3] Claudio Boria, Head of the Monetary and Economic Department at the Bank for International Settlements, discussed some of the limitations of our understanding of inflation in a session titled "How Much Do We Really Know About Inflation" at the 87th Annual General Meeting of the Bank for International Settlements in June 2017; for more information, see https://www.bis.org/events/agm2017.htm.

[4] Goodhart C, Pradhan M. *Demographics Will Reverse Three Multi-decade Global Trends*, BIS Working Papers No. 656, 2017.

[5] A common counter-argument to this narrative is to ask why Japan, which already has a declining workforce and an aging population, has struggled for decades with *deflationary* pressures. Goodhart and Pradhan argue that while Japan's labor was becoming increasingly scarce, labor was abundantly available in the rest of the world. Japanese corporates, therefore, could and did offshore production to keep wages from rising.

did in recent decades. In addition, technological developments facilitate price comparisons, reducing the pricing power of firms. It is also worth noting that technological changes create challenges in the measurement of inflation due to the need for quality adjustments in product categories that experience material improvement over time (such as electronic goods). It is often argued that such measurement challenges create an upward bias in inflation statistics.

Monetary policy: For some economists, monetary policy is the primary driver of inflation. Milton Friedman[6] famously said, "Inflation is always and everywhere a monetary phenomenon." The theory is that, for inflation to persist, the money supply must increase more quickly than increases in output. In simple terms, loose monetary policy (reducing interest rates and increasing the supply of money) is expected to be inflationary, whereas monetary tightening (increasing rates and contracting the money supply) is expected to be disinflationary. Clearly, very loose monetary policy and the lack of inflationary pressure since the global financial crisis have challenged this view.

By design, modern monetary policy is supposed to respond counter-cyclically to inflation, acting as a stabilizing influence on the rate of price increases (and could therefore be considered a cyclical driver of inflation). However, with inflation targets set above zero (often around 2%) and with a demonstrable aversion to deflation, modern monetary policy arguably also has a structural inflationary bias.

CYCLICAL DRIVERS

Economic growth: Periods of strong economic growth are likely to be associated with strong demand for goods as well as reducing the overall level of slack within the economy. In particular, periods of strong economic growth tend to see falling levels of unemployment (in order to meet rising aggregate demand), which typically leads to wage pressures. However, this relationship is not straightforward, as evidenced by the relatively muted wage pressures observed in recent years despite very low levels of unemployment (especially in the US).

Commodity prices: Energy and basic commodities are an important input, either directly or indirectly, into the production of most goods, so commodity price movements can be an influential factor on the general price level. Commodity prices can be volatile, as supply is subject to political and geopolitical influences (for example, in the case of oil, OPEC decisions continue to play an important role). However, as the use of renewable energy sources proliferates and the energy intensity of production around the world falls, the impact of energy prices on inflation is likely to decrease.

Fiscal policy: Increases in government spending are generally considered inflationary, as the additional demand for goods places upward pressure on prices. Conversely, fiscal austerity, or a reduction in government spending, is expected to depress prices. Fiscal policy tends to be counter-cyclical in nature, in part due to the existence of automatic stabilizers (for example, taxation income tends to fall and welfare payments tend to rise as incomes fall and the number unemployed increases).

[6] Winner of the 1976 Nobel Memorial Prize in Economic Sciences.

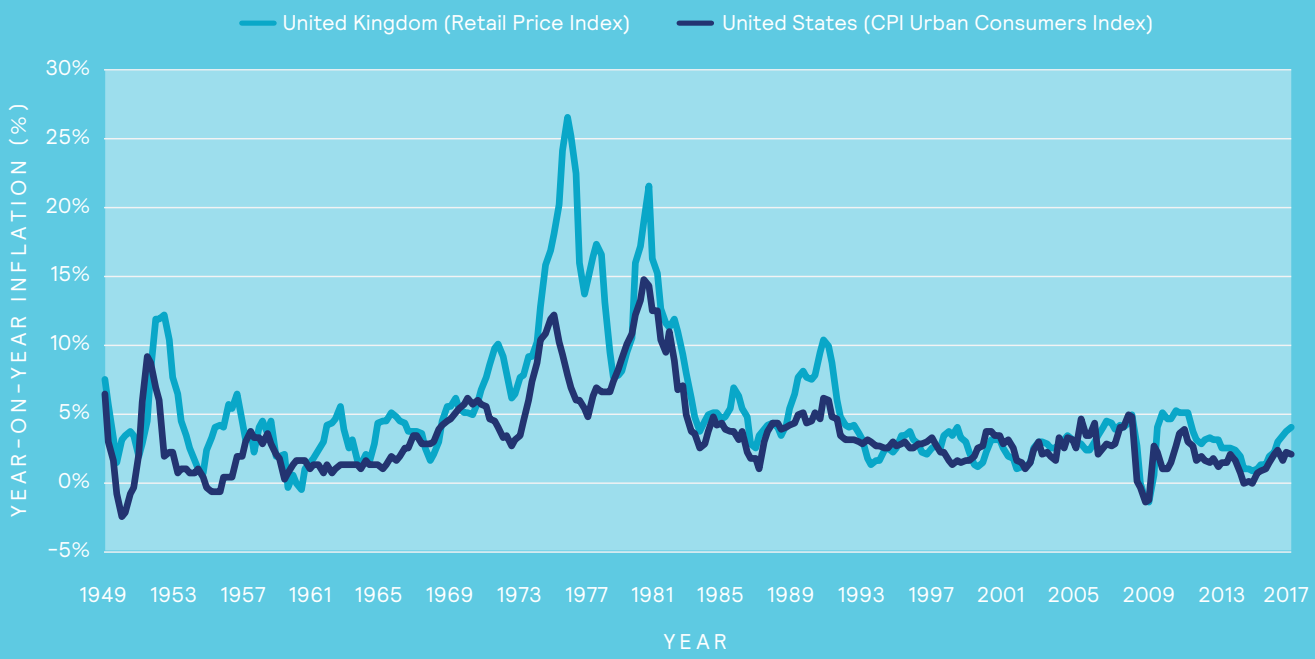
IS INFLATION DEAD OR JUST RESTING?

Forward-looking views on inflation can sometimes take on an almost dogmatic dimension, with strongly held beliefs sitting at either end of the spectrum.

Over the period following the inflation spike of the 1970s and early 1980s, inflation has been remarkably subdued across the developed world, as illustrated in Figure 2.

Forward-looking views on inflation can sometimes take on an almost dogmatic dimension, with strongly held beliefs sitting at either end of the spectrum. At one end are those who argue that "inflation is dead," with this thesis often resting on a combination of central bank independence, the structural reduction in the strength of organized labor and technological disinflation. At the other end of the spectrum are those who argue that inflation is almost inevitable as unemployment levels reach secular lows, demographic trends begin to reverse and central bank "money printing" (quantitative easing) eventually flows into the real economy.

Figure 2 – Headline Inflation



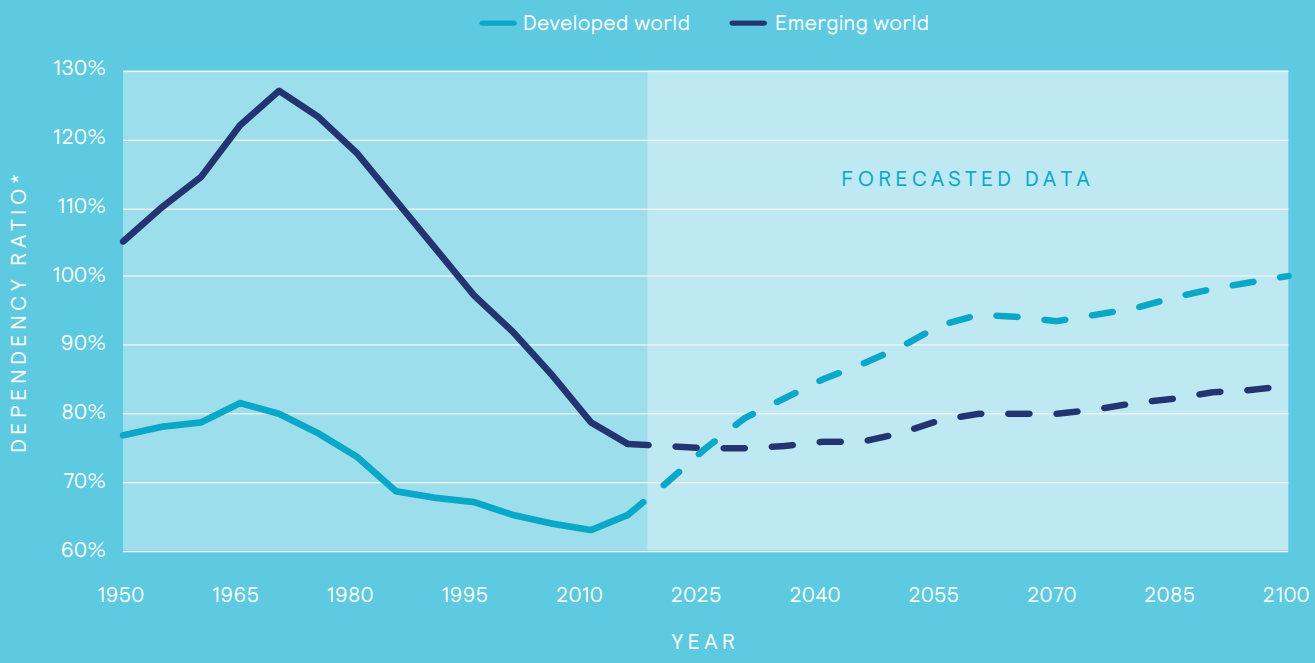
Source: Bloomberg

A gradual aging of populations (leading to a rising dependency ratio) could add a long-term inflationary stimulus to the global economy.

Notwithstanding the difficulties in forecasting inflation, it is worth noting that some of the structural and cyclical drivers of inflation are now either less disinflationary in effect or likely to become outright inflationary. In particular:

- Demographic trends are in the process of changing direction. As the chart in Figure 3 suggests, the ratio of the dependent to the working-age population (the "dependency ratio") is in the process of moving through an inflection point across the globe, with the projected upward trend far more notable in the developed world. Adopting the broad position of the BIS (2017) paper mentioned earlier, a gradual aging of populations (leading to a rising dependency ratio) could add a long-term inflationary stimulus to the global economy.

Figure 3 – Dependency Ratio Over Time



Source: United Nations Population Division, World Population Prospects (The 2017 Revision)

*The ratio of the non-working population, defined as those aged under 19 and 65 or older, to per 100 the working population, defined as those aged 19 to 64. A value of 100% means that the working population and the non-working population are of equal size.

- Globalization cannot continue indefinitely. As the massive pools of cheap labor that entered the global economy from Asia, Latin America and Eastern Europe in recent decades see their wages and living standards increase, they will become less of a disinflationary force than in decades gone by.[7] In addition, while there is some scope for further trade liberalization, there is perhaps a greater chance of moves in the opposite direction (often described as "deglobalization"). This arguably removes one of the potent disinflationary forces of the last 30 years.

- In relation to the cyclical drivers, these can, to some extent, be offset against the impact of monetary policy, given that central banks have a clear mandate to control inflation when economies start to overheat. However, it is reasonable to argue that cyclical forces within the economy (stronger growth and low levels of unemployment) are more inflationary now than they have been at any time in the post-global financial crisis period. And while monetary policy will respond to the emergence of inflationary pressures, fiscal policy in the US is likely to support cyclical pressures on inflation in the short to medium term.

It is worth noting that technology is likely to remain a powerful disinflationary force for decades to come, with the prospect of rapid increases in automation placing downward pressure on wages and production costs. However, it is extremely difficult to assess the likely pace of technological development and its impact on inflation over time.

Given the challenges of determining the drivers of the inflationary process and the complex interaction of the forces described above, we would caution against making firm predictions around the likely level or direction of inflation over time. However, our discussion highlights that the balance of inflationary and disinflationary forces in the global economy may be changing and there are plausible scenarios in which inflation moves higher. Indeed, we would argue that inflation risks are currently skewed toward the upside from a cyclical standpoint. Investors should therefore avoid biasing portfolios in a way that assumes a continuation of past trends and seek to ensure that portfolios are likely to be robust in inflationary scenarios.

Inflation risks are currently skewed toward the upside from a cyclical standpoint. Investors should avoid biasing portfolios based on past trends and ensure that portfolios are robust in inflationary scenarios.

[7] A number of potential sources remain for cheap and abundant labor — many parts of Africa, for example, have a young and growing population, with around a quarter of the world's under-15-year-olds living on the continent according to the UN. However, as the global supply of very cheap labor ebbs, the associated disinflationary pressure should also fall.

BUILDING A PORTFOLIO THAT IS 'INFLATION AWARE'

We may be shifting into an environment where inflation is likely to be viewed as a more important risk factor.

Inflation as we know it is an imperfect measure of any individual's, or investor's, spending power, as it is unlikely that any one individual or institution's spending is accurately reflected in the basket of goods used by statisticians to calculate the rate of inflation. Add to this the difficulties in accounting for quality improvements — if you can buy a smartphone today for the same price as a regular phone 20 years ago, what sort of price reduction is equivalent to that gain in functionality? — and it is clear that inflation is a more complex concept than it may initially seem.

Consequently, the appropriate response to the threat of general price inflation will be highly investor-specific, depending on the nature of one's objectives, liabilities and overall sensitivity to higher inflation scenarios. However, most investors are concerned, at least to some extent, with maintaining the purchasing power of their portfolios over time and may therefore benefit from assets that offer some degree of protection against periods of higher inflation.

We would also note that the desirability of inflation protection will depend on the nature of the economic/inflationary regime. Consider, for example, the past 50 years, which we could crudely split into two broad regimes: from the late 1960s up until the Asian financial crisis in 1997, and from 1997 to the present day. In the first period, inflation was relatively high and variable and viewed by many investors as a source of economic and market risk. In this environment, equities and bonds suffered when inflation spiked and inflation protection was valuable to investors. Conversely, in the latter period, when deflation generally was considered the greater threat to global growth, there tended to be a positive relationship between risk assets and inflation, rendering explicit forms of inflation protection less valuable to investors. To the extent that we may be shifting from an environment in which inflation is likely to be viewed as a more important risk factor, explicit sources of inflation protection may become more valuable to investors.

To help frame discussions around inflation protection, we distinguish between three asset categories:

INFLATION-BEATING ASSETS	INFLATION-SENSITIVE ASSETS	INFLATION-HEDGING ASSETS
are expected to provide a positive real return (that is, an inflation plus return) over long periods but may deliver low (or negative) returns during episodes of higher inflation.	are also expected to provide a positive real return over the long term but may additionally provide some degree of protection in (some) moderate to high inflation scenarios.	are expected to act as a direct hedge against higher inflation outcomes over the short to medium term; however, such assets may not offer positive long-term real returns.

INFLATION-*BEATING* ASSETS

Although equities make for a sensible allocation for a growth investor targeting real returns over the long term, they could be negatively impacted by high inflation over the short to medium term.

Assets such as broad market equities have an expected return that is materially greater than inflation, having delivered inflation-beating returns over long periods. However, this higher return is not linked directly to the level of inflation, and extended periods of negative real returns have occurred in the past — as illustrated in Figure 4 (on the next page), equities underperformed inflation by more than 2% per annum for a decade during the stagflation of the 1970s and early 1980s. In an inflation surprise, the negative impact from a rising discount rate (due to higher bond yields) might more than offset any upward revision to earnings expectations (due to higher inflation). This can manifest itself in a significant shock to equity markets, as occurred in 1973–1974, when global equities experienced a drawdown of almost 40%. Consequently, although equities continue to make for a sensible allocation for a growth investor targeting real returns over the long term, they could be negatively impacted by high inflation over the short to medium term.

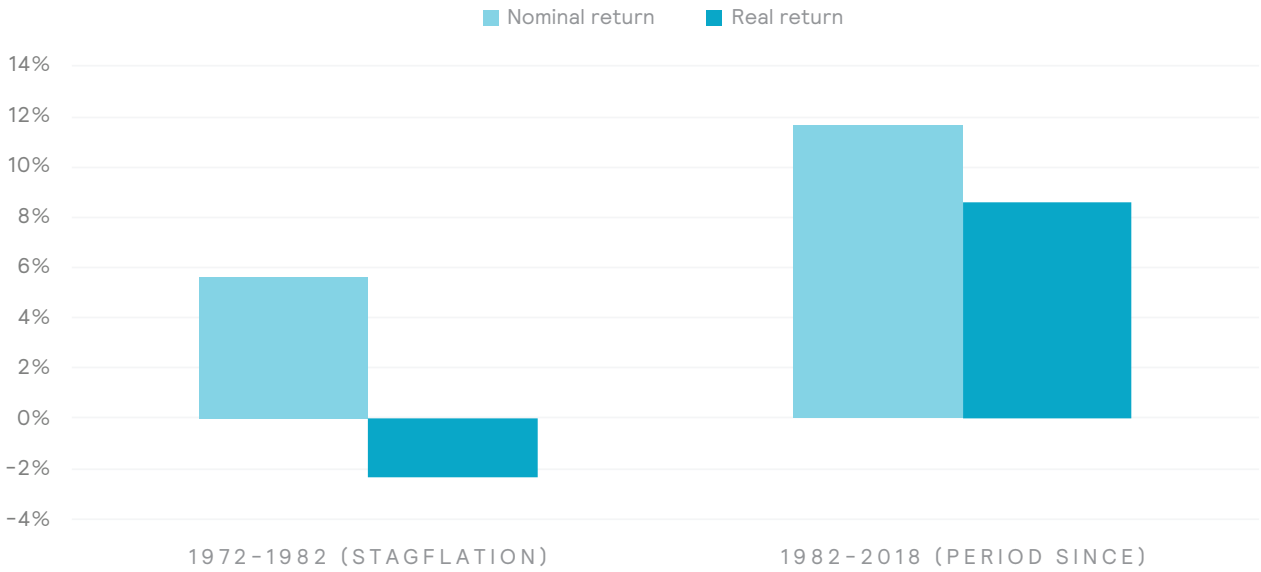
INFLATION-*SENSITIVE* ASSETS

The most natural fit are inflation-sensitive assets such as "real assets," which may include property, infrastructure or natural resources.

The most natural fit for this category are "real assets," such as property, infrastructure or natural resources. A great deal of research, on core and listed property in particular, has been conducted, with mixed results, to try to determine the inflation sensitivity of these assets. There does, however, appear to be reasonably strong support for a link between economic growth and capital returns on these assets.[8] So if inflation is pro-cyclical (that is, coincident with stronger economic growth), then real assets may offer a reasonable degree of inflation sensitivity. However, where inflation is counter-cyclical or driven by supply shocks, this relationship may break down and the impact of a rising discount rate (due to an upward shift in bond yields) can lead to falling prices.

[8] Investment Property Forum. *Property and Inflation*, April 2011.

Figure 4 – US Equity Returns



We would encourage investors to differentiate within asset classes when assessing the inflation sensitivity of real assets, as sectoral and geographical differences can be significant. For example, long-lease property, the private rental sector and infrastructure debt do, in some markets, offer cash flows with a contractual link to inflation, thus providing a greater degree of inflation sensitivity.

It is also worth noting that commodities can provide a high degree of sensitivity to higher inflation scenarios. This is due to the centrality of commodities in agriculture and the production of goods across the economy. The challenge for many investors in holding commodity assets is the absence of any regular income yield or reason to expect a long-term return premium. Certain other commodities that are not central to agriculture or the production of goods — precious metals such as gold,[9] for instance — have also demonstrated some inflation sensitivity over the long term. This is due to them historically being viewed as an effective store of value.

INFLATION-*HEDGING* ASSETS

Inflation hedging assets such as inflation-linked bonds or inflation swaps have an explicit link to inflation.

These are assets with an explicit link to inflation, such as inflation-linked bonds or inflation swaps. Due to the direct link to inflation, these assets can offer a genuine hedge against inflation if held to maturity, subject to the credibility of the issuer.[10] However, the return offered by these assets in excess of inflation may be very small or negative (as is currently the case for inflation-linked government bonds in a number of markets). It can be argued that investors effectively sacrifice an "inflation risk premium" (relative to fixed interest bonds) to remove the risk of inflation erosion over time.

[9] For further discussion of the merits of gold investment, see our 2017 article "Between the Gold Bugs and Gold Bears."

[10] Inflation-linked bonds are most commonly issued by developed world sovereign governments and therefore have a very low level of credit risk.

In relation to inflation-linked bonds, it is worth noting that although they offer a strong hedge against inflation when held to maturity, there may be a reasonable degree of variation between realized returns and realized inflation along the way, due to their typically long duration and associated interest rate sensitivity. This may not be an undesirable characteristic for some investors (for example, defined benefit schemes looking to hedge both interest rate and inflation risks), but may present a challenge for real return investors or those seeking to hedge only inflation risk.

OTHER ASSETS

Our categorization excludes three main types of asset: fixed income assets with fixed nominal coupon payments and redemption values, such as government bonds, corporate bonds and high yield credit; floating-rate assets, for which payments vary in line with short-term interest rates; and absolute return strategies that state a fixed outperformance target, many of which are expressed relative to short-term interest rates (for example, Libor +3% per annum).

Fixed income assets will naturally tend to suffer lower real returns in an inflation surprise or a higher inflation scenario for two main reasons. First, as future payments are fixed in nominal terms, any increase to inflation will directly reduce the real value of these future payments. A second, more indirect, effect is related to monetary policy and central bank behavior. As markets generally expect to see central bankers respond to higher inflation by raising interest rates, the current market value of these interest rate sensitive assets may fall as future payments are discounted at a higher rate.

It is this second relationship that should make floating-rate assets materially more resilient to higher inflation outcomes than fixed income assets. Clearly, this relies on the response of central banks remaining consistent with their behavior in recent decades — that is, increasing interest rates in response to the emergence of inflationary pressures. This relationship is not one-to-one, involves some time lag, especially in an inflation surprise, and will be driven in part by the wider economic environment as central bankers weigh inflation concerns against growth concerns.

Finally, with regard to absolute return strategies, it is very difficult to make generalizations and investors should not rely on these strategies to provide inflation protection in portfolios. In particular, with the pattern of short-term active returns often being highly variable, any connection to underlying cash rates can be swamped by the impact of active positions. However, to the extent that alpha opportunities exist across different regimes (including inflationary scenarios), absolute return strategies may well prove more resilient than equities or fixed interest bonds in a higher inflation environment.

TAKING ACTION

1 Inflation is a complex and poorly understood phenomenon. Investors should therefore be careful not to extrapolate the benign inflation experience of recent decades into the future. Powerful disinflationary forces (in particular, technological advances) remain, but there would also appear to be a number of upward pressures on inflation, from demographic trends to cyclical pressures. We therefore believe that investors need to consider and prepare for a wide range of economic outcomes, including higher inflation scenarios that have not been seen in developed economies for many decades.

2 Inflation-sensitive investors holding portfolios dominated by broad market equity and fixed interest bonds should consider diversifying both their growth and their defensive portfolios. Within growth portfolios, real assets — both listed and unlisted — may provide some degree of inflation sensitivity. Within defensive portfolios, inflation swaps, inflation-linked bonds, shorter-duration bonds and floating-rate assets are likely to prove more robust under higher inflation scenarios than traditional fixed interest government and corporate bonds.

3 Building on a clear assessment of an investor's inflation needs (driven by the investor's objectives and liabilities), we encourage investors to review the balance of risks within portfolios and, in particular, the extent of their exposure to higher inflation scenarios. This will naturally lead to a discussion around the potential merits of inflation-beating, inflation-sensitive and inflation-hedging asset exposures.

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