



Inflation

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Initially meeting as the Man AHL Academic Advisory Board in 2014, the board held a discussion on whether momentum was a behavioural phenomenon. Since then, the group has expanded to include colleagues from Man Numeric, Man Solutions, Man GLG and Man GPM, providing a forum for debate where the academics can meet with thought leaders from Man Group's investment teams to spur new insights on contemporary themes.

In 2021, the focus was on inflation. Previous topics include **ESG investing**, **momentum as a behavioural phenomenon**, **overfitting and its impact on the investor**, **skewness**, **crowding** and **factor investing**.

Contents

Executive Summary	4
Part I: Causes and Policymakers' Instruments	5
Part II: Consequences on Real Economy and Policymakers' Goals	8
Part III: Impact on Financial Instruments	10

Executive Summary

Part 1: Causes and Policymakers' Instruments

Defining inflation is hard as no two consumers are identical. Moreover, inflation measures should be adjusted for both changes in buyers' preferences as well as for the evolving quality of products. Finally, the horizon is crucial. For example, a permanent change in inflation is considered more important than transitory unexpected inflation by policymakers and market participants alike.

In addition, confusion is compounded by economists' and policymakers' lack of agreement on the causes and effectiveness of measures to control inflation. As a result, we see a wide divergence of opinions. A particularly debated idea is Modern Monetary Theory, which seeks to justify large-scale money creation without the downside of inflation.

Inflation does not have to be the same everywhere, but it appears to be becoming a more global phenomenon. Possible causes are convergence in policies, increased access to foreign markets, and trade dependence. On the other hand, strong drivers of inflation in the 1970s and 1980s, such as oil, nowadays appear weaker.

Realised inflation and inflation expectations feed into each other, generating a self-fuelling process, which can become dangerous if inflation expectations become unanchored. Hence, these expectations are crucial. Recent academic research looked at how these expectations are formed, and, among other things, it linked them to demographics: those that experienced a period of high inflation react differently to those that never had.

Part II: Consequences on Real Economy and Policymakers' Goals

Whereas the level of inflation has some direct consequences, such as the opportunity cost of holding less cash, it is inflation uncertainty that has the most profound impact on the real economy. It increases hurdle rates for new investments slowing economic growth.

There is agreement that inflation targeting offers an anchor point for reducing this uncertainty, even if the optimal number – or range – for the inflation target is up for debate and potentially depends on the state of the economy.

Central banks need to have credibility, both that they are actively pursuing the target and that they have the tools to do that. If there is a deviation from the target, painful or unpopular actions need to be undertaken. And if there is doubt that the central bank will initiate these tough measures, their statements will have little influence on inflation expectations.

Part III: Impact on Financial Instruments

For financial instruments, it is particularly important to distinguish between different types of inflation, as it is unexpected inflation, and changes in the term structure of expected inflation, that move prices the most. In addition, the time horizon of inflation is essential. That is, a shift in the term structure of expected inflation will profoundly impact long-duration asset prices, but this is unlikely to be the case for a 1-month transitory unexpected increase in inflation.

There is no single asset that can be considered a perfect hedge against inflation: gold held its real value over the long term, but it can be unreliable over shorter horizons; a diversified portfolio of commodities has exhibited some ability to hedge unexpected inflation, but individual commodities did not behave uniformly, and the asset class as a whole is capacity constrained; inflation-linked bonds – which only preserve their own value – are still untested during inflation surges. However, certain active strategies show resilience to inflation. In particular, the behaviour of some large capacity dynamic strategies in inflationary environments is promising, most notably trend-following. And faster trading strategies based on over- and under-reaction to macroeconomic news can be developed.

1. Causes and Policymakers' Instruments

1.1. Measuring Inflation

Campbell R. Harvey (CH): It is really hard to define inflation, and indeed there's no single definition. The inflation rate is different for every person, as everyone has their own basket of goods. Therefore, each inflation measure represents a different sort of average across the population. Another level of complexity is added by changes in the quality of products, and the adjustments for this effect sometimes seem arbitrary.

Neil Shephard (NS): However, there is the potential to measure inflation in a more dynamic fashion now than what has been done historically. In the past, people had to go to different shops and manually check prices; nowadays, there is plenty of administrative data, faster access to prices, and methods can be compared across countries.

Kate Barker (KB): A big issue around measuring inflation, at least from the perspective of the central banker, is that the chosen method must have traction with the public: this is why the inclusion of house prices is such a big issue. If the target of a central bank is not related to the actual cost of living, broadly, this undermines credibility, and in turn this affects the behaviour of the public. While administrative data is easier to access, it needs to be properly interpreted; it can make the issue of quality change particularly difficult.

Teun Draaisma (TD): The task is easier if you have a purpose in mind. If the goal is to measure inflation with a precision of two decimal digits, there are all the difficulties just mentioned, but it might be not that hard to determine whether the environment is stable and prices are predictable from the perspective of a company or a consumer.

NS: Regarding the case for different inflation measures, there are measures for different segments of the population. This goes back to the point of the impossibility of determining 'who' the consumer is. The distinction of permanent and temporary inflation on the other hand is much more technical, and it becomes a problem of time-series analysis.

1.2. What Might Be Causing a Change in Inflation?

TD: Both causes of inflation and economic theories change over time. A few decades ago, inflation was seen as a purely monetary phenomenon. Later, the attention turned to supply bottlenecks, the output gap and inflation expectations. More recently, the prevailing theory is changing again with Federal Reserve Chair Jerome Powell's policy of not reacting until inflation happens. It seems that the economic theory is the enabler for policymakers to do what they do, and in this moment, they want to do Modern Monetary Theory. $MV=PY$ is still seen as an identity but deemed useless as the velocity of transactions (V) is viewed as unpredictable – perhaps researching V further could be a fruitful exercise.

CH: Indeed, the academic community has failed to provide clear guidance on inflation. In the 1960s and early 1970s, there was a real inflation scare, and the disagreement about the causes of inflation then was similar to today. To some extent, we still argue about the Phillips curve trade-off. While models are more mathematically advanced, they do not offer answers to key questions.

NS: Another difficulty in the current environment is that consumers' preferences are changing rapidly. How will these baskets of goods adjust when we return to a more stable environment? This is hard to predict.

Daniel Taylor (DT): It is indeed important to understand how transitory or permanent the impact of the crisis is. A complication here is that there might be multiple causes all acting together. Right now, it seems temporary, and the supply-demand equation will solve things in the medium term. The potential for inflation, which has changed dramatically over the last year, has been generated by the coordination, or lack thereof, of monetary and fiscal policy, which implied a debasement of paper currency. Eventually we are going to see the impact of helicopter money in higher prices for goods.

CH: Yes, but this does not need to happen immediately, as money could be kept under the mattress. Think of what happened during the Global Financial Crisis: the substantial increase in the money supply did not turn out to be inflationary because banks kept the extra liquidity as excess reserves with the Fed. This is where the V or velocity plays a key role.

Jose Wynne (JW): In this regard, there is a stark difference between emerging and developed markets. In emerging markets, consumers are often cash constrained, and the link between money supply and inflation is much tighter. In developed markets, this is not the case. Moreover, inflation expectations have been very well anchored for decades, therefore even increasing the money supply might not generate inflation. It is worrisome to see so many moving pieces at the same time: politicians appear less risk-averse than in the past, the markets could doubt the US dollar being a safe haven, and there is potential for contamination across different components of inflation.

1.3. Globalisation of Inflation

Sandy Rattray (SR): When we talk about inflation, we should be clear that inflation is often experienced very differently in different countries. For example, the 1970s experience of inflation was remarkably different in the UK, the US and Germany. Germany had the lowest inflation despite being almost entirely a net importer of oil. So, when we talk about inflation, we often mean US inflation, but we should be careful that this is not the same as inflation elsewhere.

Giuliana Bordigoni (GB): Observe how inflation has been decreasing simultaneously for most developed countries over the last few decades. Why is there such a convergence? Globalisation implies that imports and exports are easier to price around the world. Moreover, we are increasingly reliant on technological services, and the cost of technology acted as a deflationary pressure throughout the world. So, it is perhaps becoming a more global phenomenon than it used to be in the 1970s.

CH: There is a further point that is about substitution: if you are sourcing from China and prices go up, you can change your sourcing to Vietnam. This reduces the dispersion of inflation. We have seen how becoming very reliant on one country makes you vulnerable to supply disruptions. In the future, companies will be more careful to have a diversified portfolio of suppliers even with higher costs.

KB: Convergence in policy regimes lies behind convergence in inflation. Is it possible for physical goods to become on-shored now because of resilience problems? Companies might become keener on off-shoring for services, and one can see services inflation become more global and goods inflation become more domestic.

Otto Van Hemert (OVH): Is the convergence in policy regimes driven by the rest of the world following the US or are there other causes? Does it make sense to look at the actions of central banks other than the Fed?

TD: The typical situation is that there is a policy leader and then other countries follow: think of the 1930s when it took a few years for all countries to abandon the gold standard; or the adoption of inflation targeting formally started in New Zealand in 1989; or the adoption of quantitative easing following the Global Financial Crisis. We think the current adoption of policies inspired by Modern Monetary Theory is a global phenomenon, but it is led by one country; in this case, the US is the leader.

1.4. Commodities' Impact on Inflation

SR: It is common wisdom that rising commodity prices cause inflation. But the experience has been different across countries: Think of the US and Germany in the 1970s. Right now, there are shortages of commodities that are not dissimilar to the 1970s, but they are a much smaller part of the consumption basket. Is the link still valid or was it an occurrence specific to that period?

JW: This is linked to the following question: do market participants perceive the shock as permanent and that they need to get hold of physical goods ahead of everybody else? This is very much about inflation expectations.

KB: There are two main differences in comparison to the 1960s-1970s. Firstly, policymakers did try to mitigate the effect of individual commodity prices rising on living standards, while nobody would expect that to happen right now, and policymakers seem willing to accept a temporary rise. Moreover, commodities are indeed less relevant today than in the past.

Nicholas Barberis (NB): We still don't fully understand the Great Inflation of the 1960s and 1970s. The traditional view is that inflation picked up in the 1960s, but the Fed didn't react aggressively enough. That pushed up inflation expectations, which, together with supply shocks in commodity markets, led to higher inflation in the 1970s. But recently some economists have presented evidence for a quite different view which attributes the inflation to Regulation Q, which put a ceiling on interest rates on deposits. That gave people the incentive to spend rather than save, pushing up aggregate demand and inflation. So, while commodity shocks surely played a role, other things may have been important too.

1.5. Do Policymakers Adjust to the Mainstream Economic Theory?

TD: An observation in this sense is that V and inflation have not been correlated at all over the last 30 years, but they were very tightly linked before that. So that it might be that the prevailing economic theory creates its own truth, as when policymakers were focused on managing money supply, V was a critical driver for inflation, and when they focused on other things, V ceased to be of interest.

KB: I think it is actually economists responding to the view of policymakers. And the changes are driven by the fact that consumers' behaviour is dependent on the environment which changes as well. For example, during the Great Financial Crisis, economies did not behave as the mainstream economic theory would have predicted.

CH: Relating policy to economic thinking at the time might be a very important point. One of the most interesting episodes was wage and price controls in the US, first established by Republicans and then embraced by leading Keynesian economists. The policy was introduced to react to the Phillips curve not working, but it was a disastrous experiment. This is why neo-Keynesian today are not in favour of any form of price control. More importantly, it is very worrisome that many of our policymakers seem to disregard the consequences of running large structural deficits. It seems like Modern Monetary Theory has already been adopted.

OVH: But if inflation expectations play a big role, the central banks have an incentive to keep them anchored. To what extent can you believe their statements?

KB: As a central banker, you have to call it what it is. If the central bank cannot do anything more than what they are currently doing, then they should say that. But I reckon there is disagreement on this point.

CH: Indeed, the Fed does not have as much control as people think they have. Market participants should have figured that out, but they did not. Recently there has been mayhem in the markets because of minor changes in interest rates forecasting, the so-called dot-plots, but the Fed board members' record of forecasting is actually worse than a random walk.

1.6. Survey Data

NB: A big trend in economic research in the past decade is the greater use of survey data, for example, on people's expectations about inflation and other economic outcomes. A striking finding is that experience matters: your expectations about inflation depend on the inflation you have personally experienced in your lifetime. For example, how dovish or hawkish the members of the Federal Open Market Committee are can be explained in part by their personal experience of inflation. And the price changes people observe when they go shopping directly affect their expectations.

TD: Indeed, surveys on lowly priced and high frequency purchases might be very informative. As the euro was introduced, people reported a high rise in inflation expectations as prices of coffee and newspapers were marked upwards. Could this be adapted as an early predictor of inflation expectations?

NS: This could also be useful in determining whether an incipient inflation is simply a dislocation or the beginning of a long-term systemic effect, as different components of inflation would behave differently in the former case and tend to co-move in the latter.

1.7. Labour Rigidities and Demographics

SR: Another leading cause of inflation in the 1970s was the rigidity of the labour market, especially in terms of reduced movement of labour. Is the current situation in any way similar, insofar as we see an increased rigidity in the labour market?

CH: The wage component of inflation does indeed look more permanent than many of the other components. We see wages, that are notoriously sticky on the way down, being bid up. Increasing in state minimum wage laws is also gaining traction from a political perspective. Of course, there are forces reducing wages in the long run, most notably globalisation and technology, which correspond to jobs being either off-shored or being executed by robot.

NS: There might also be forces increasing the labour force in the short term. For example, the re-opening of schools and childcare at the end of the summer might release a large number of workers in the job market.

KB: Immigration flows will likely play a major role as well. In this direction it might be revealing to see how stopping the flow of EU workers entering the UK will affect wages there.

DT: Indeed, much research has been done on linking inflation and demographics. For example, there should be a positive relationship between size of the dependent population and inflationary pressure, even though Japan is a clear counter example in this sense.

KB: However, demographics move very slowly, and the decline of the workforce in the general population is effectively a supply shock that can be managed. It is not necessarily inflationary unless policymakers want it to be. A problem with ageing population might be that, if you think in nominal terms, comparing prices to 20 years ago or to 80 years ago have very different psychological impacts.

JW: Going back to a previous point, different demographics have different experiences of inflation and this will naturally impact their inflation expectations. I closely followed the prolonged deflationary situation in Japan, and to the government, it was clear that people younger than 35, who never saw inflation, were the most sceptical about its occurrence.

2. Consequences on Real Economy and Policymakers' Goals

2.1. Costs of Inflation

NS: Even if inflation were to be uniformly applied to everything, there would still be the cost of continual repricing. But the main cost comes from inflation uncertainty. There are also some plusses however: it helps negotiating real wages down, and to control debt.

JW: Yes, inflation uncertainty is very problematic: it causes volatility in relative prices, distorting information, and it is hard to know where to stand when making a purchase. Moreover, long-term funding is disrupted by the noise for both sides of contracts. Another issue is taxation on profits based on historical costs, which is heavily influenced by inflation. Extensive indexing, including the taxation mechanism, is needed.

CH: Indexation is not a silver bullet. The choice of the index is a policy decision, and the chosen basket of goods might be reweighted to become more favourable to policy objectives. Technology helps in dealing with price adjustments, and this might make the economy more resilient to higher inflation volatility.

NS: The added value of technology might be dependent on the sector. If a grocery store buys and sells in the same week then technology should be helpful, but if inventories are loaded a year in advance there is nothing that technology can do to prevent the damage of inflation uncertainty: contracting in the future is complex.

DT: A partial solution might be for employees to be paid continuously, with the index built into wages. However, it is not immediate that employer will agree to this.

NB: We should not forget about what economists call shoe leather costs. When inflation gets very high, people become desperate to exchange cash for something more stable – and navigating an environment like that can impose substantial mental costs on people. This may not seem very relevant for the US or Europe right now – but as inflation and inflation expectations creep up, you get closer to the point where these costs start to become significant.

2.2. Optimal rate of Inflation

KB: An inflation target of 2% is broadly derived, as 0% seems too low because of nominal rigidities, but 5% seems too high as it would lead to too much price uncertainty. I would argue for a higher target inflation rate, such as 3%, but this policy proposal is often rejected as it is argued that either market participants won't believe the new target if inflation is below it at the time of introduction, or might think that the rise of the inflation target is done only out of convenience if inflation is high.

JW: The optimal rate further depends on the state of the economy. If there is potential for large real shocks, there needs to be room for monetary policy. The situation is similar if the country is running positive terms of trades that might suddenly reverse. Moreover, the Great Financial Crisis showed the importance of staying away from the Zero Lower Bound.

OVH: There may be an increased risk of unanchored inflation if policymakers have a target range rather than targeting an absolute number. One could argue that it is not good to have a constant target.

CH: I think that 2% is useful for capturing an anchor point for inflation expectations. If your goal is to reduce uncertainty, then a single number is very useful. But if, for example, there are consecutive prints of inflation much higher than 2% in the US without a clear explanation or decisive policy, the Fed loses credibility after a while.

TD: In 1989, the Bank of New Zealand chose an inflation target of 0-2%; it is not clear why they chose it, but they seem to have anchored it for the rest of the world. The risk of central banks losing their credibility and inflation expectations going unanchored is very real, but it is also reasonable to think that sufficient, rather than perfect, credibility is needed.

GB: On the above, the Fed recently met and communicated that inflation is likely at 3%, but it declared not to be worried about this. They are potentially allowing for some hidden discretion, or for a range, in the choice of the target.

KB: I'm arguing in favour of allowing a bit of uncertainty in where the price level goes, and sometimes a bit of uncertainty is useful in economics. For example, it is likely that in the 2000s, economic actors felt too secure and took too high risks.

2.3. How Much Influence Does the Fed Have?

NS: The Fed's power to combat inflation is probably at the historical maximum if it chooses to do so, because of the gigantic balance sheet. I think the main concern is not about missing tools, but about the will to act with potentially unpopular measures.

CH: Measuring the influence of the Fed is a complex task: in 1960, it could engineer the yield curve – and it did so. Now, it only seems to affect the short end. And a rapid outflow of the reserves has the potential to be inflationary as well.

TD: One should distinguish between the powers of creating inflation and of taming inflation. Regarding taming inflation, the Fed has a large balance sheet, as mentioned, and it clearly has the option of hiking rates. Inflation can be quelled but the measure may be unpopular. Central banks are likely not very independent, politically, so whether they will indeed implement unpopular rate hikes to quell inflation remains to be seen.

KB: Part of the current vast power of the Fed comes from holding both government and corporate debt. A related problem is about the Fed seeking to have influence on tasks that it shouldn't have, such as ensuring fair access to the job market for people belonging to minorities.

DT: Indeed, the Fed is potentially getting out of what it has been tasked for, for example with the increasing concern about wealth inequality. But it is true that while tightening the reins might have negative consequences on the real economy, it could help in mitigating these inequalities.

JW: Another fundamental constraint for the Fed is given by hysteresis: if it stops the easing policy too early, it might end up having unemployment at 6% forever.

CH: Cryptocurrencies must be mentioned as well. In countries where people do not have confidence in their monetary authority, crypto widespread adoption might prove similar to a process of dollarisation without policymakers deciding it. In developed markets this is not an immediate concern, but in some emerging markets, such as Venezuela, its effects are already evident. It used to be that only rich Venezuelans could manage a US dollar bank account in Florida. Now any Venezuelan with a mobile phone can hold US dollar-backed crypto stablecoins. The rise of cryptos makes it even harder to determine what is money, i.e., M in the $MV=PY$ equation.

3. Impact on Financial Instruments

3.1. Different Types of Inflation

CH: To assess the sensitivity of financial assets to inflation, i.e., their beta to inflation, you need to know what inflation is in the first place. Early academic works used changes in the monthly inflation rate. Also, inflation is usually looked at as an instantaneous measure, but there is also the issue of the relevant horizon. For asset prices, long-term inflation is the most relevant, which makes the distinction between permanent and temporary inflation preeminent: for example, a temporary disruption in a supply does not affect asset prices because the price increase will mean revert. Importantly, bonds and equities are valued over the long-term – that is their long cash-flows are discounted with a rate that is sensitive to inflation over various horizons. Hence, the term structure of expected inflation is crucial for valuation – not just the month-to-month variation. Moreover, also the difference between expected and unexpected inflation is relevant, as asset prices react to the latter. I think that what matters the most is a long dated unexpected portion of inflation.

JW: It is also important to clarify what sort of inflation scenario is being discussed. For example, say that Fed moves the inflation target to 3%, then all the other relative prices should remain the same, while the US dollar takes a big hit for being taxed an additional 1% p.a. forever. When measured in euro terms, this does not really have an impact on any asset in the world. A different scenario is an actual shock to the real US economy that might put even the European Central Bank on the defence. The best trade in the two scenarios is clearly different: In the former, you simply want to be short US dollar; in the latter, you probably want to focus on relative value trades such as Treasuries versus Bunds.

TD: One should also keep in mind that high or low inflation should be irrelevant as long as it is perfectly expected. It is unexpected inflation and inflation volatility that affect real returns.

OVH: Empirically one observes a high beta of commodities to inflation. This is potentially exacerbated by their low capacity and by their perceived inflation hedging properties.

GB: We have seen how self-fulfilling prophecies are ubiquitous around the theme of inflation. In the last six to nine months, we have seen market participants piling into popular hedges when signs of inflation appeared, but this is hard to disentangle from supply shocks and high demand from China. Therefore, if there is inflation then we see trends appearing in some commodity markets. In particular, trend-following on inflation itself was a good performer.

3.2. Equities

OVH: In our recent empirical paper¹, we observed that stocks of commodity producers behave rather like stocks than like commodities. One could argue that it is better to hold the commodity. Can stocks be a hedge?

DT: On the equities side, I would first remark that Growth stocks are likely to be particularly sensitive due to more of their value being driven by cash flows further in the future. Owning companies that are producing goods might not be a perfect hedge and might deliver negative real rates, but it would be far superior to holding cash or fixed income. Value would likely be the most compelling cohort within equities, given less sensitivity to rising to rates and exposure to more cyclical parts of the economy, such as materials, energy and financials.

TD: An equity long-short factor reacting to inflation, and hopefully with positive carry as well, is a huge commercial opportunity. However, in our analysis, the flavour of Value we tested was surprisingly weak, and being long commodities or trend seemed to deliver the best performance.

OVH: Thinking of Value is justified by considerations on the discount rate effect. An asset with a cash flow concentrated in the short term is a better inflation hedge. Maybe this argument is failing to consider what happens to the cash flow component?

NB: It is helpful to keep in mind a theoretical benchmark which says that inflation is irrelevant for stock prices: when inflation moves higher, this pushes up both the discount rate and expected cash flows in the present value formula, so the net effect on price is roughly zero. It's useful to think about how to square this with the empirical fact that real stock returns are negatively impacted by inflation. One explanation is nominal illusion: when inflation moves higher, it is salient to people that the discount rate should be higher, but they forget to adjust their expected cash flows by a commensurate amount.

DT: To some degree, we are learning in real time what the market has to say about inflation and inflation expectations. And so far, we have seen a healthy rotation into Value equities. Moreover, one of the worst periods for being long equities was during the crash of the Nifty Fifties, and the Value factor did very well in that period. Given its large capacity and current low prices, it is potentially one of the best options to preserve real wealth.

3.3. Hedges According to Common Wisdom

SR: Inflation-linked bonds are often considered a natural hedge. Despite being a 40-year old market, it is still essentially untested, as there was no relevant inflationary period since their introduction. So far, they behaved as illiquid assets during stressful periods, and their price fell sharply when volatility spiked. Can they really be considered an inflation hedge?

OVH: A theoretical observation, backed by empirical results, is that their beta to inflation is 1. Therefore, they should hold their value, but do not act as a hedge against inflation for the rest of the portfolio.

SR: However, a significant part of pension funds strategy 'protects' itself against inflation exactly using this asset class. And all the empirical evidence we gathered so far is driven by short inflationary shocks. We might need a longer inflation period to truly assess their performance.

1. The Best Strategies for Inflationary Times (Neville, Draaisma, Funnell, Harvey, van Hemert; 2021). Forthcoming in Journal of Portfolio Management.

CH: When discussing standard inflation hedges, one should be careful about gold. Its returns in inflationary periods are good, but most of the performance is from the single year of 1979. Its price is too volatile to be a good short-term inflation hedge, but in the very, very, long term, gold has held its real value.

KB: These are remarkable times. A lot of people operating in the market and applying de-risking of pension funds are quite young, and were not around when we had all the difficulties in the 1970s and 1980s. They might think that something that behaves as a perfect hedge in a backtest will hold its hedging properties, and they will be more inclined to believe that their positions are risk free, which I don't think is possible.

3.4. Over- and Under-Reaction to Macroeconomic News

NB: An important development in research on survey expectations is a new technique, the Coibion-Gorodnichenko regression. It is based on regressing forecast errors on forecast revisions, and can tell us whether people are under- or over-reacting to news. Interestingly, professional forecasters seem to predominantly over-react to news when making macroeconomic forecasts. We don't know exactly why. But if it's true more generally, it could have important implications, helping to explain both business cycle fluctuations and financial market volatility.

TD: It is common wisdom that forecasters over-react: for instance, a popular strategy consists in reversing the direction of the first hour of returns after non-farm payroll numbers are reported and keep the position for three days. But this is in stark contrast to Momentum, which assumes an underreaction.

NB: The question of whether and why people under- or over-react to news has bedevilled economists for decades, and there is still no clear-cut answer. But we are making progress. For example, we've found that people tend to overreact to news that brings to mind extreme exemplars. For instance, if there is news about a possible accounting fraud at a firm, investors tend to over-react because they immediately think of extreme cases like Enron.

CH: You can imagine that the degree of over- or under-reaction is linked to the degree of confidence in the forecast. This is something I looked at in my own research on over precision.²

NB: Yes, I find that evidence compelling. It also seems that people overreact more when forecasting less persistent processes like returns or earnings growth. Overreaction of this kind can be exploited with trading strategies, including Value strategies, but you have to be careful because, in some instances, people under-react.

4. Final Words

NS: The mainstream view is that the economy is going through a massive dislocation as it comes out of the Covid-induced crisis. It is not clear if this will unwind or if it will lead to higher prices and higher expected prices fuelling a bout of high inflation. To decide whether inflation is transitory or permanent, one could focus on observing price changes in goods or services that are not distorted at the moment.

CH: There is a huge debate about the current inflation being permanent or transitory. I think it is a mixture of both, but the market seems to interpret the current inflation prints as being completely transitory, ignoring structural issues such as wage changes and structural issues in the housing market. The risk of inflation has heightened, which includes both an inflation surge as well as the spectre of deflation. Imagine the following tail scenario: a new variant of the virus that is not treated by the current vaccines generates a new wave of infection in winter 2022, called Covid22; another series of lockdowns is necessary, with the potential of more to come, and the psychological impact on consumers would be devastating. This is not likely, but it must be put on the table in any risk management exercise. However, markets are behaving today as if: 1) the pandemic is over; 2) the pandemic never occurred – that is no residual structural damage; and 3) there is zero probability of Covid22.

NB: Inflation is probably the most talked about aspect of the economy, but we still don't really understand it. We don't fully understand its costs, its relationship to unemployment, or how people form expectations about it. You can see this right now: there is a lot of disagreement, even between smart and informed people, as to what will happen going forward. From the outside, you might be unimpressed by the state of economic knowledge. But I think that is unfair: this is a hard problem to figure out. And while we do have a lot left to understand, I'm very encouraged by recent research in this area, which combines innovative techniques and new data sources in a way that is really enhancing our understanding.

KB: One of the questions we are addressing today is: What is happening? Have we got a regime change? I think we are moving into a world with somewhat higher inflation than the last decade, and that central banks are going to behave with a little more inflation tolerance than in the past. As a central banker coming from a prolonged period of low inflation, you can think that what is happening is only transitory, but you want to be opportunistic and use the situation to change the expectation of inflation. And then as a central banker you worry about two things now: on the one hand, you do not want to prevent the economy running a bit hot in a world where politics has shifted, because this would make you lose your licence to operate; on the other hand, you risk losing credibility if inflation gets out of control. I would say that you care about the former more than about the latter, because if you lose your licence to operate there is nothing you can do to amend it.

Authors

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Professor of Finance at the Yale School of Management



Nicholas Barberis is the Stephen and Camille Schramm Professor of Finance at the Yale School of Management, where he works on behavioral finance, and specifically on building psychologically-realistic models of market fluctuations and investor behavior. He is the co-author, with Richard Thaler, of the most-cited survey of behavioral finance research. He is the founder and lead instructor of the Yale Summer School in Behavioral Finance. In 2015, he took over from Robert Shiller and Richard Thaler as the organiser of the leading academic conference in behavioral finance. Professor Barberis holds a B.A. in Mathematics from Cambridge University and a Ph.D. in Business Economics from Harvard. He joined the Man Group Academic Advisory Board in 2013.

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Professor Campbell R. Harvey, a leading financial economist, has been an Investment Strategy Advisor to Man Group since 2005 and has contributed to both research and product design. He is a Professor of Finance at Duke University and Research Associate at the National Bureau of Economic Research in Cambridge, Massachusetts. He served as Editor of *The Journal of Finance* from 2006 to 2012 and as the 2016 President of the American Finance Association. Professor Harvey received the 2016 and 2015 Bernstein Fabozzi/Jacobs Levy Award for the Best Article from the *Journal of Portfolio Management* for his research on differentiating luck from skill. In January 2021, he was named 'Quant of the Year' by the *Journal of Portfolio Management* for his outstanding contributions to the field of quantitative finance. He has also received eight Graham and Dodd Awards/Scrolls for excellence in financial writing from the CFA Institute. He has published over 150 scholarly articles on topics spanning investment finance, emerging markets, corporate finance, behavioural finance, financial econometrics and computer science. His book co-authored with Sandy Rattray and Otto van Hemert, *Strategic Risk Management*, is forthcoming in 2021 (John Wiley and Sons). Professor Harvey teaches both an advanced asset management course, as well as an offering that focuses on DeFi or blockchain enabled decentralised finance. He has served on the faculty of the University of Chicago, Stockholm School of Economics and the Helsinki School of Economics. He has also been a visiting scholar at the Board of Governors of the Federal Reserve System. He holds a PhD in Finance from the University of Chicago.

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Neil Shephard is the Frank B. Baird Jr., Professor of Science at Harvard University, holding his professorship in the Economics Department and the Statistics Department. He has been Chair (Head of Department) of the Statistics Department at Harvard since 2014. Before joining Harvard University in 2013, Neil was a professor at Nuffield College, Oxford University, for 23 years. He was also the founding director of the Oxford-Man Institute from 2007-2011. Neil is an elected fellow of the Econometrics Society and the British Academy, and has been awarded the Guy Medal in Silver by the Royal Statistical Society and an Honorary Doctorate by Aarhus University. He has served as an associate editor of *Econometrica* since 2002.

Dame Katharine Barker

Independent Non-Executive Director, Man Group



Katharine ('Kate') Barker was appointed to the Man Group board as a non-executive director in April 2017. Kate was a Senior Adviser to Credit Suisse from 2010 to 2016 and served as a member of the Bank of England's Monetary Policy Committee between 2001 and 2010. Kate also held the position of Chief Economic Adviser for the Confederation of British Industry from 1994 to 2001.

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Giuliana Bordigoni is Director of Specialist Strategies and a member of Man AHL's management and investment committees. She has held several positions since joining Man AHL in 2007, including Head of Alternative Markets and Director of Fixed Income, where she has made significant contributions to Man AHL's managed futures and Evolution portfolios. Giuliana holds a PhD in Mathematics and Applications from Politecnico of Milan and a Master of Advanced studies in Finance from ETH and University of Zurich.

Teun Draaisma

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Teun Draaisma is the joint lead Portfolio Manager within Man Group's multi-asset offering. He joined Man Group in May 2018 from BlackRock, where he was global equity strategist since 2012, focusing on portfolio management and asset allocation. Prior to this, he was European equity strategist at Morgan Stanley from 1997 to 2010, where he ran the European Equity Strategy team. He has also been a portfolio manager at TT International. Teun holds a master's degree in Econometrics from Erasmus University Rotterdam.

Sandy Rattray

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Sandy Rattray is Chief Investment Officer of Man Group and a member of the Man Group Executive Committee. He is also a member of the Man Group Responsible Investment Committee. He was previously CEO of Man AHL from 2013 to 2017, and CIO of Man Systematic Strategies from 2010 to 2013. Before joining Man Group in 2007, Sandy spent 15 years at Goldman Sachs where he was a Managing Director in charge of the Fundamental Strategy Group. He also ran Equity Derivatives Research at Goldman Sachs in London and New York. Sandy is a co-inventor of the VIX index. He is a board director of MSCI Inc and sits on the MSCI Advisory Council and the Jesus College Cambridge investment committee. Sandy is a governor of the Southbank Centre in London and is a founding patron of the London Cycling Campaign. He holds a Master's Degree in Natural Sciences and Economics from the University of Cambridge and a Licence Spéciale from the Université Libre de Bruxelles.

Daniel Taylor

CIO, Man Numeric



Daniel ('Dan') Taylor is CIO of Man Numeric. He also serves on the Man Group Executive Committee and the Man Numeric Investment Committee. Dan has had multiple roles at Man Numeric since joining as an intern in 1998, including director of small cap strategies, head of hedge fund strategies, and senior member of Man Numeric's strategic alpha research team. During his tenure at Man Numeric, Dan has conducted a wide range of research, including areas such as momentum, earnings quality, valuation, investor behavior, and market timing. Dan holds a Bachelor of Arts degree in economics with honors from Harvard University. He is also a CFA charterholder.

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Otto Van Hemert is Director of Core Strategies and a member of Man AHL's management and investment committees. He was previously Head of Macro Research at Man AHL. Prior to joining Man AHL in 2015, Otto ran a systematic global macro fund at IMC for more than three years. Before that, he headed Fixed Income Arbitrage, Credit, and Volatility strategies at AQR, and was on the Finance Faculty at the New York University Stern School of Business, where he published papers in leading academic finance journals. Otto holds a PhD in Economics and Masters Degrees in Mathematics and Economics.

Jose Wynne

Portfolio Manager, Man GLG



Jose Wynne is a Portfolio Manager on the GLG Emerging Markets Debt team. Jose joined Man GLG from Barclays where he was Managing Director, Head of FX Research for the past four years. Prior to this, he worked within the North America FX Strategy team as well as spending time as a Senior Emerging Markets Strategist. Prior to his time at Barclays, Jose started his investment career as Vice President, Economic and Market Analyst before moving into the position of Director, Senior LatAm Strategist at Citigroup. Jose was an Associate Professor at the Fuqua School of Business for five years and holds a PhD in Economics from UCLA, as well as a BA in Economics from UNLP, Argentina.

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Giovanni De Gaetano is a quant at Man AHL. He joined Man AHL in 2017. Before that, he worked as Research Assistant at Humboldt University of Berlin. Giovanni holds a Masters degree in Mathematics from Sapienza Università di Roma and a PhD in Arithmetic Geometry from the Humboldt University of Berlin.

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