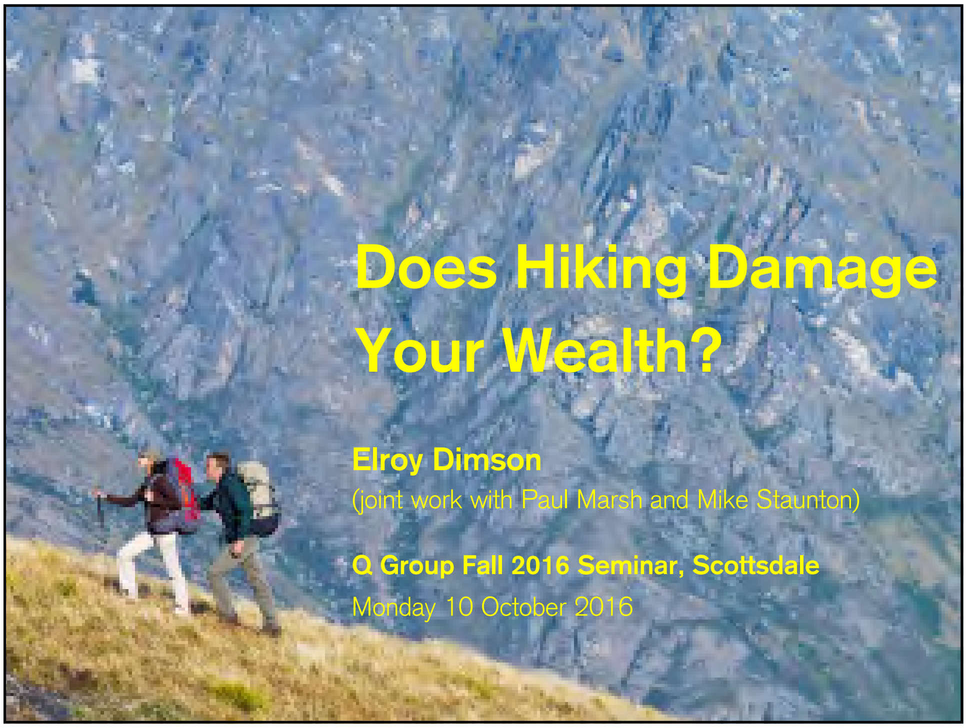
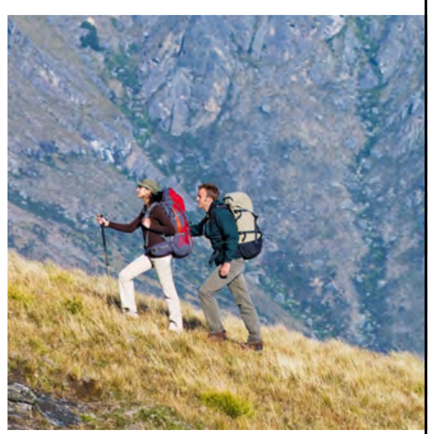


Does hiking damage your wealth?

- **Impact of interest rate hikes**
  Immediate effect of rises and cuts
  Daily data for 100 years (UK: 85 years)
- **Major asset classes**
  Equities, bonds, currencies
  USA and UK
- **Global evidence**
  Equities and bonds
  Annual data 1900–2015
  21 countries with a complete 116-year history



FINANCIAL TIMES

US Interest Rates

Fed raises rates in historic move

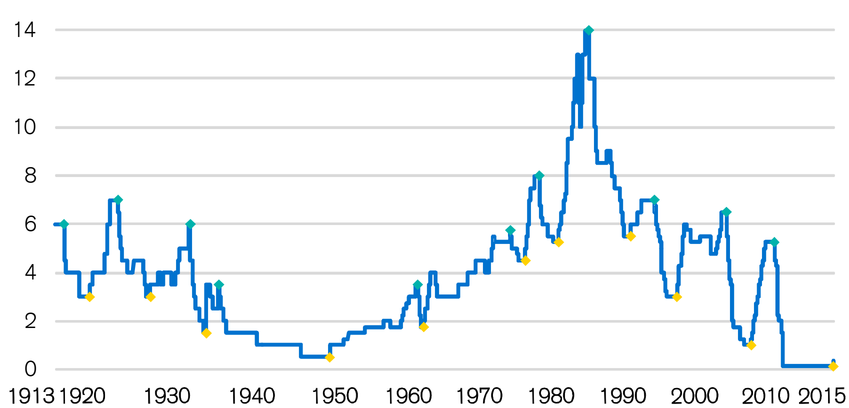
Equities rise after central bank points to gradual future increases

December 17, 2015 by Sam Fleming in Washington

The Federal Reserve has raised short-term interest rates for the first time in nearly a decade, calling an end to the near-zero borrowing costs that have prevailed since the US was struck by the worst financial crash in modern times.

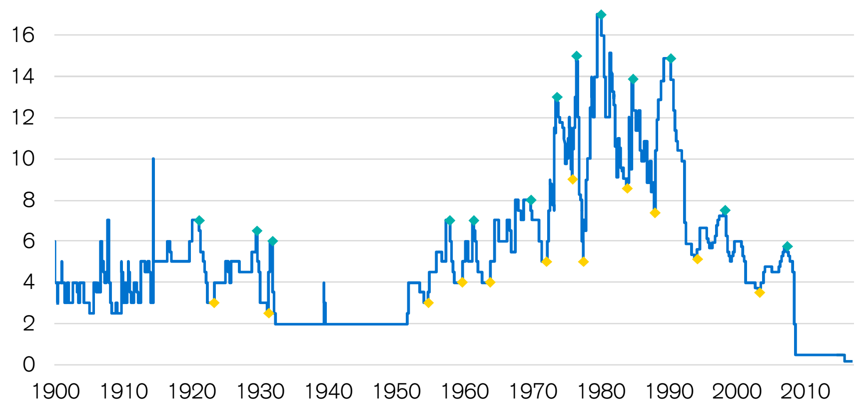
In a landmark step, the US central bank announced a quarter-point increase in the target range for the federal funds rate to 0.25-0.5 per cent, lifting it from the historic lows it has occupied since December 2008, when the US was mired in an economic crisis that would ultimately drive unemployment to 10 per cent.

US federal reserve official interest rates (%)



Lift-off after longest period of unchanged, and lowest ever, rates

UK Bank of England base rates (%)



Also lowest ever, but cutting continued and lift-off cancelled

THE WALL STREET JOURNAL

FEB. 9, 2016

MARKETS

The High Consequences of Low Interest Rates

Stock-market selloff is latest sign that many of the gains of low rates have been harvested By **DAN STRUMPF** and **JOE LIGHT**

At the start of 2016, Americans were bracing for interest rates to rise significantly for the first time since the financial crisis.

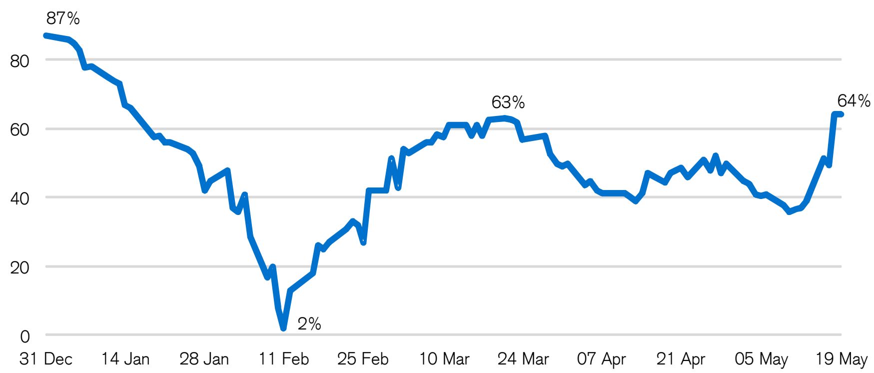
Instead, rates have slumped anew, rattling financial markets and undoing the plans of investors, consumers and businesses alike.

A little more than a month after the Federal Reserve lifted its benchmark rate from near zero, rates across the market are falling.

For now, Fed officials are keeping their options open, but the odds of another rate increase this year appear to be getting slimmer.

Fast shifting perceptions about future rate rises

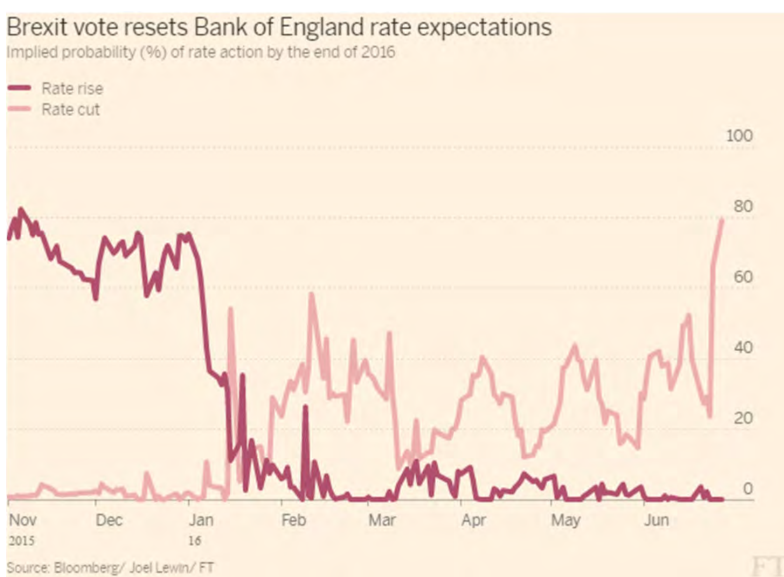
Federal funds futures implied probability (%) of at least one rate rise by end -September 2016



Source: CME Group FedWatch Tool

What are the investment implications of a rise or a fall?

Investors expected a rise, then they expected a cut



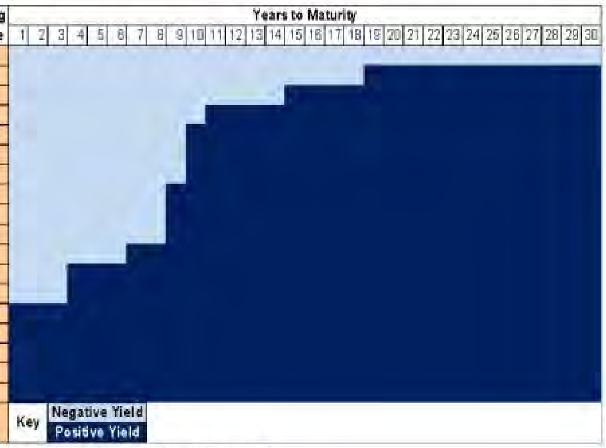
Investors keep changing their (consensus) mind!

UK investors expect cutting cycle to last a long time

Huge growth in negative-yield bonds

Figure 1. 35% of Citi WGBI is currently trading negative*

		Market Value (USD bn)	% trading negative
Country	Switzerland	40	100%
	Japan	5,199	79%
	Germany	1,223	77%
	Netherlands	401	67%
	Denmark	115	58%
	Austria	256	61%
	Finland	100	71%
	Belgium	422	48%
	France	1,645	59%
	Sweden	93	71%
	Ireland	133	54%
	Spain	908	25%
	Italy	1,579	20%
	US	7,089	0%
	UK	1,276	0%
	Australia	317	0%
	Norway	42	0%
	Canada	395	0%
	Total	**21,164**	**35%**

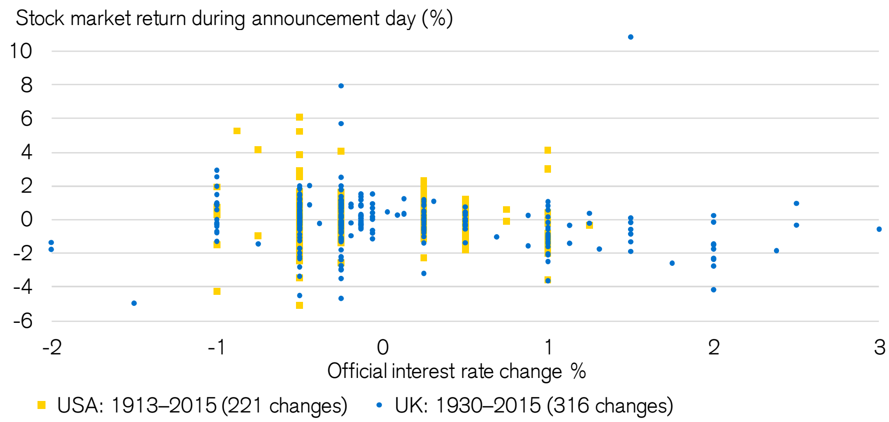


Source: Citi Research *excluding Poland, Malaysia, Singapore, Mexico and South Africa (around 2% of WGBI).

When will the Fed raise rates again…

… and when it does, what difference will it make?

Stock market reaction to rate changes: USA and UK



Wide dispersion; no obvious relationship "by eye"

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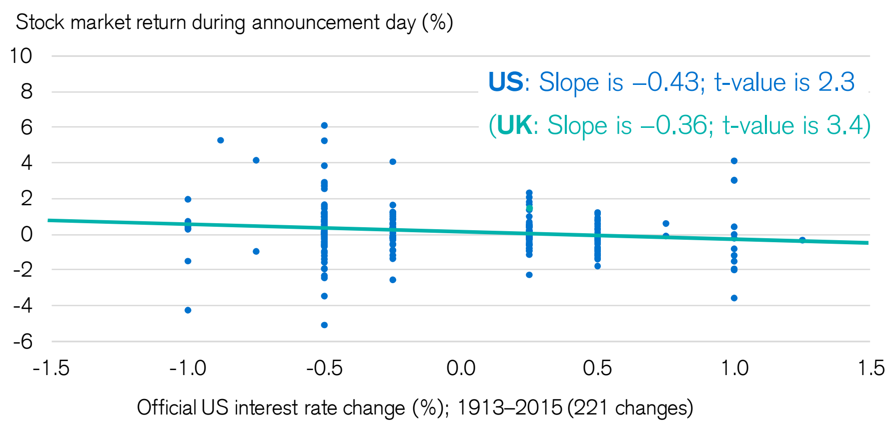
Let's look just at the US reaction to rate changes



Rate rises are on average bad news (and evidence is similar in UK)

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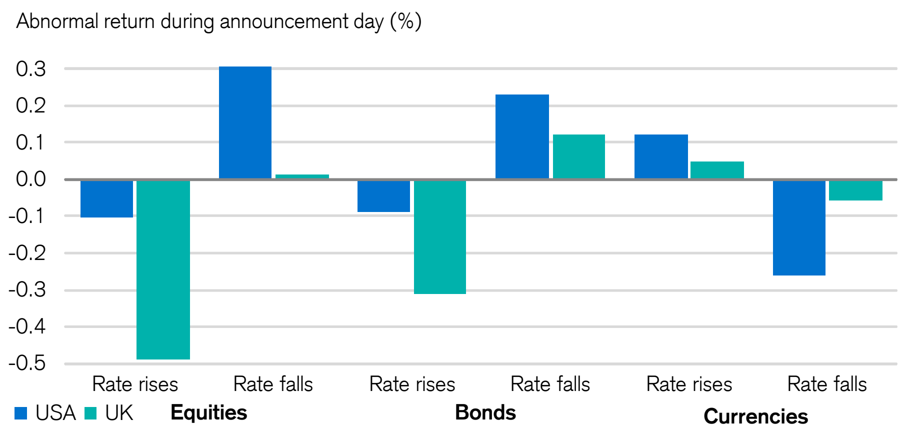
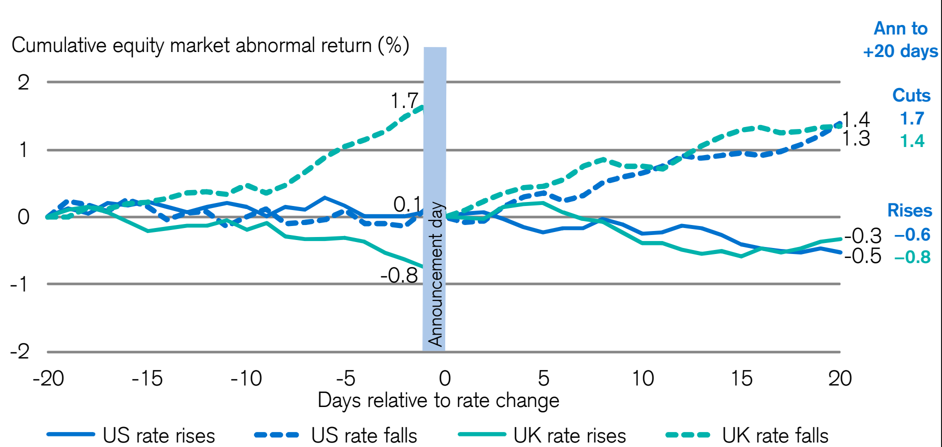
Announcement day reaction to rate changes



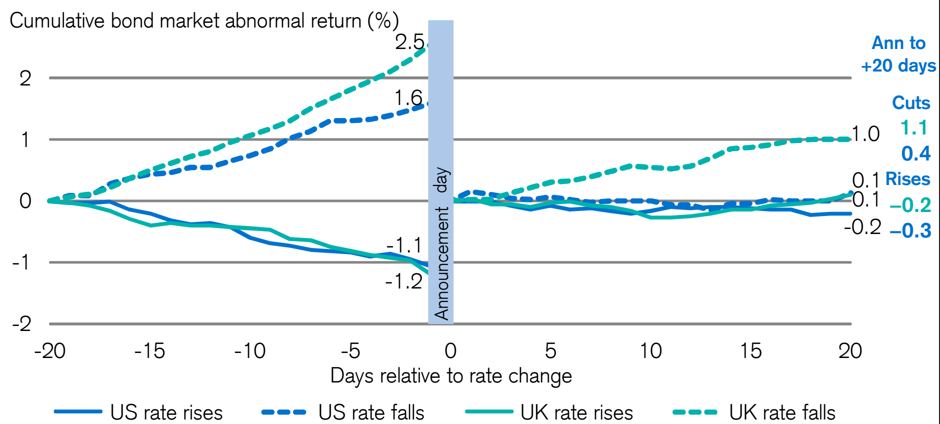
Reaction in the predicted direction, but on average quite small

Equity performance before and after rate changes



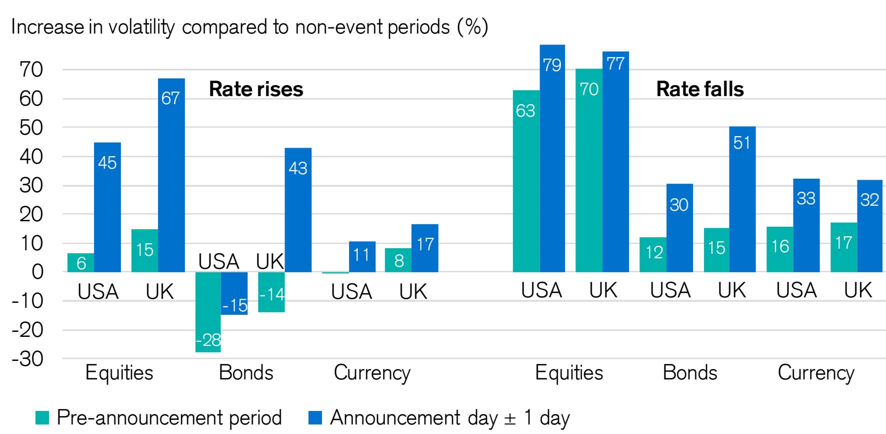
Rate rises were painful; rate cuts were beneficial

Bond performance before and after rate changes



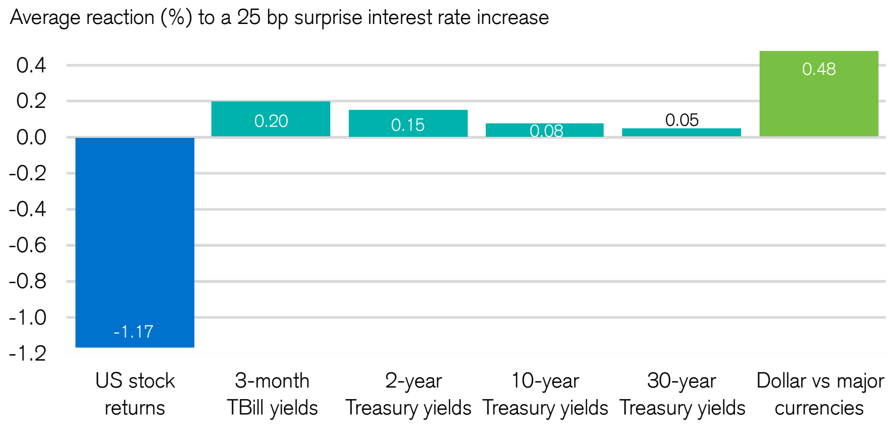
Rate changes are anticipated; hikes are bad news, cuts are good

Market conditions influence policy makers



Rate rises may be postponed when volatility is high
Rate cuts may sometimes be a response to high volatility

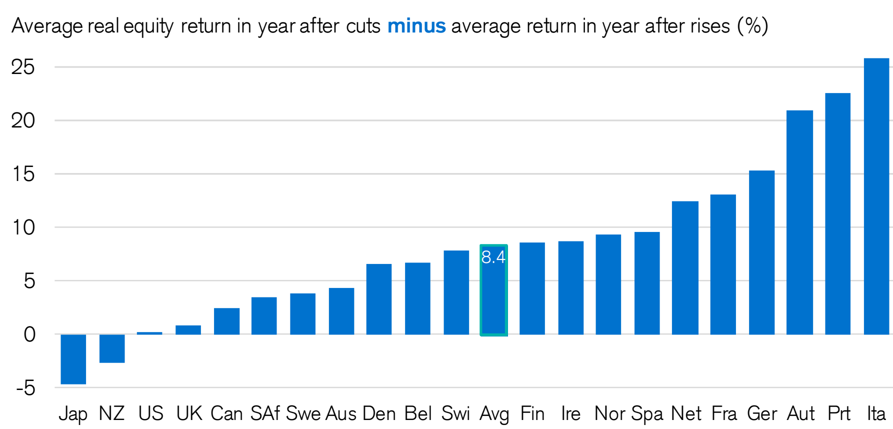
Reaction to US rate change surprises



Effects are much larger; markets react only to surprise element

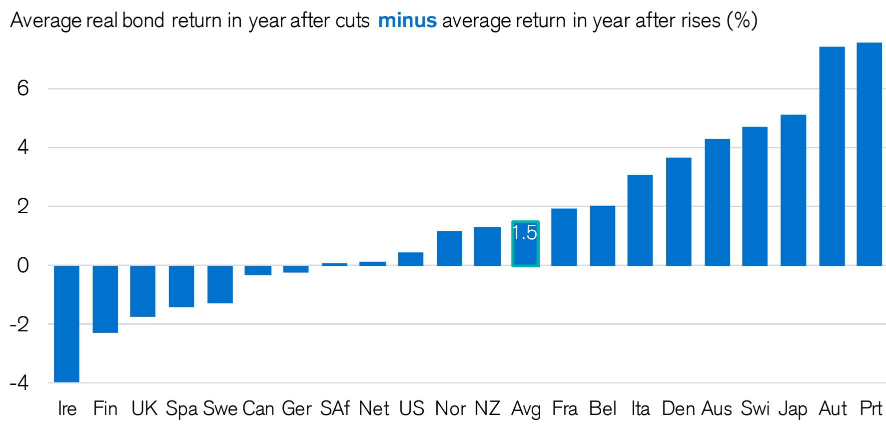
Source: Bernanke and Kuttner (2005), Kuttner (2001), Rosa (2010)

Impact of rate changes on real equity returns since 1900



Average real return 8.4% higher after rate falls than after rises

Impact of rate changes on real bond returns since 1900

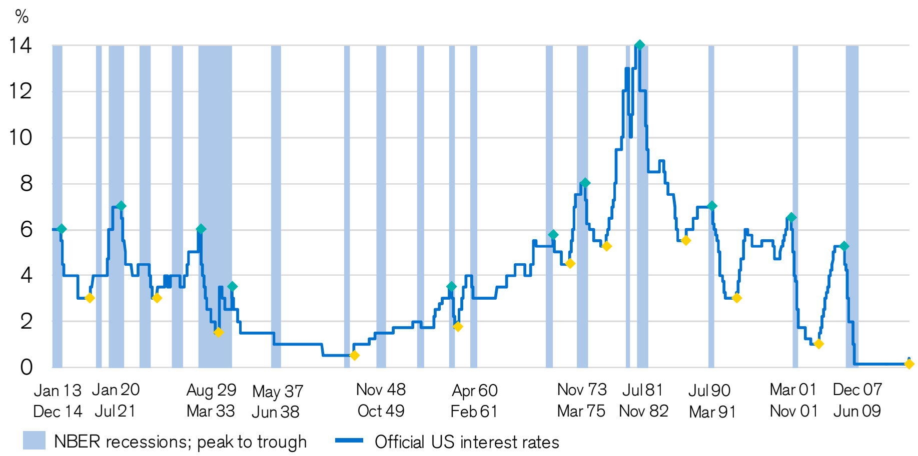


Negative reaction to rate hikes and vice versa is a global effect

Cycling for the good of your wealth

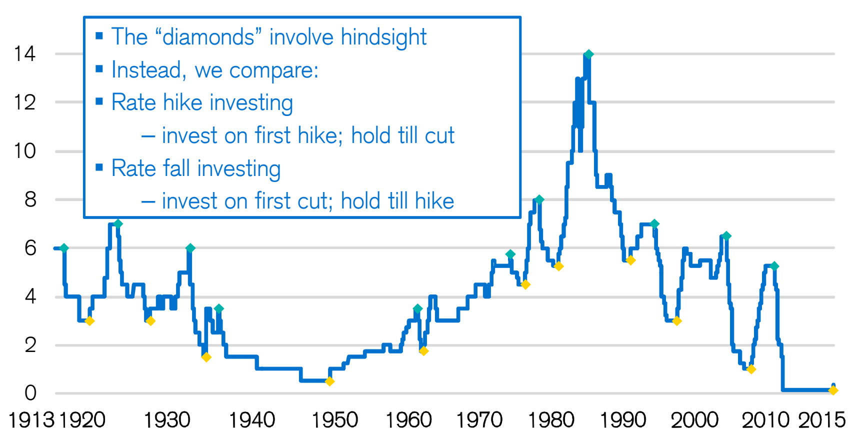
- **Asset returns over entire cycles**
  - Tightening and easing cycles
  - Real-time trading strategy
  - Avoid look-ahead bias
- **Equities, bonds, bills, currencies**
- **Equity and bond risk premia**
- **Industry returns**
- **Factor returns**
  - Value, income, size, momentum
- **Real assets**
  - Precious metals, collectibles, real estate

Economic cycles, interest rate cycles, and hindsight



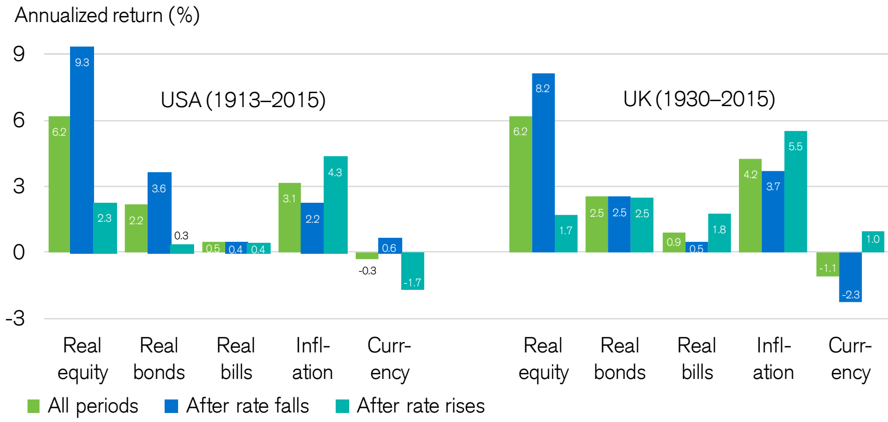
NBER dates economic cycles after they end. Try interest rates?

Trading rule for investing in hiking and easing cycles



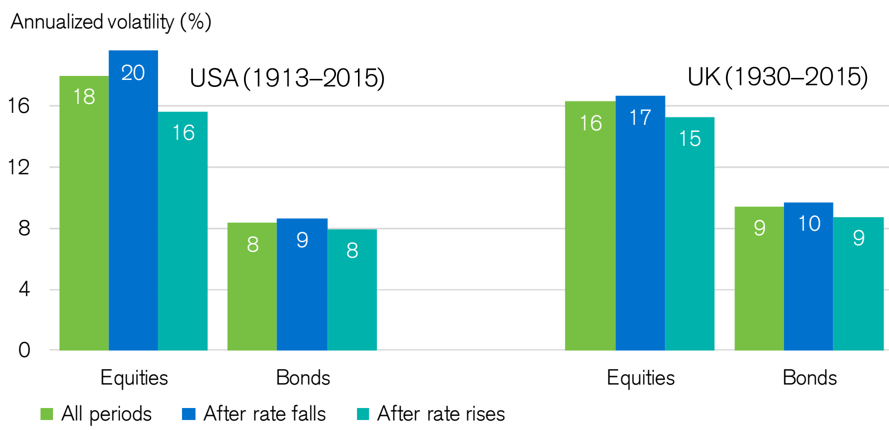
This rule could have been followed without using any hindsight

Performance of assets after rate rises and falls



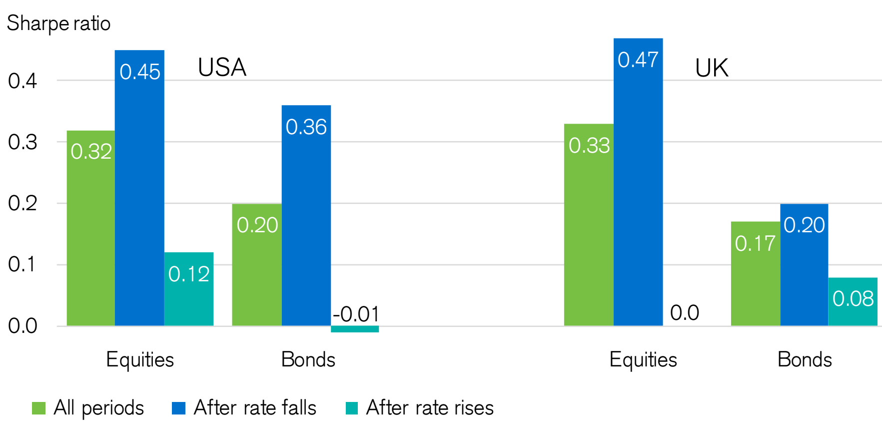
Big (negative) differences between rising and falling rate periods

Volatility after rate rises and falls



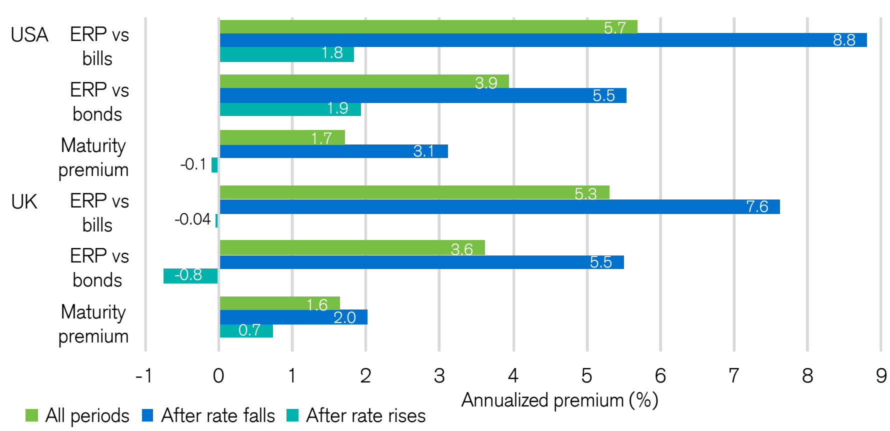
Volatility somewhat lower after rate rises than rate falls

Sharpe ratios after rate rises and falls



Sharpe ratios much lower for equities and bonds after rate rises

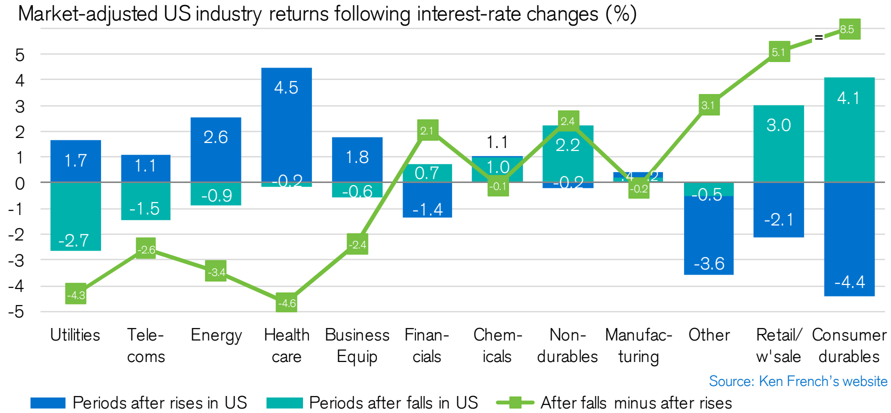
Performance of premia after rate rises and rate falls



The entire long-run UK ERP was earned during easing cycles

Impact of rate changes: US industry returns, 1926–2015

Market-adjusted US industry returns following interest-rate changes (%)

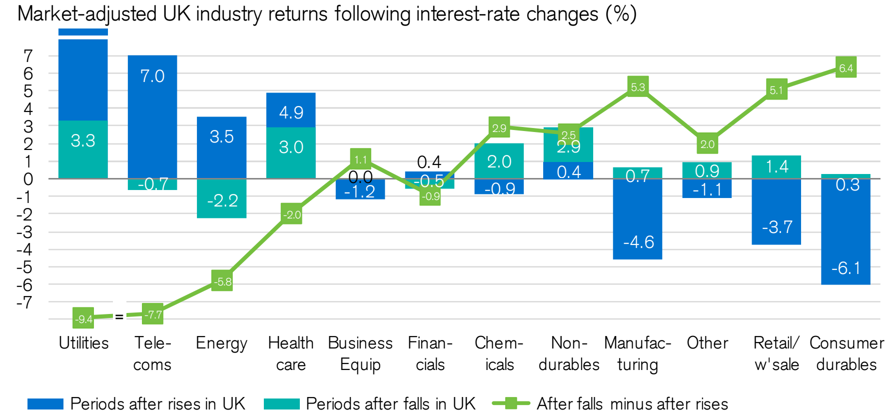


Source: Ken French's website

Rising rates worst for cyclicals; best (relatively) for defensives

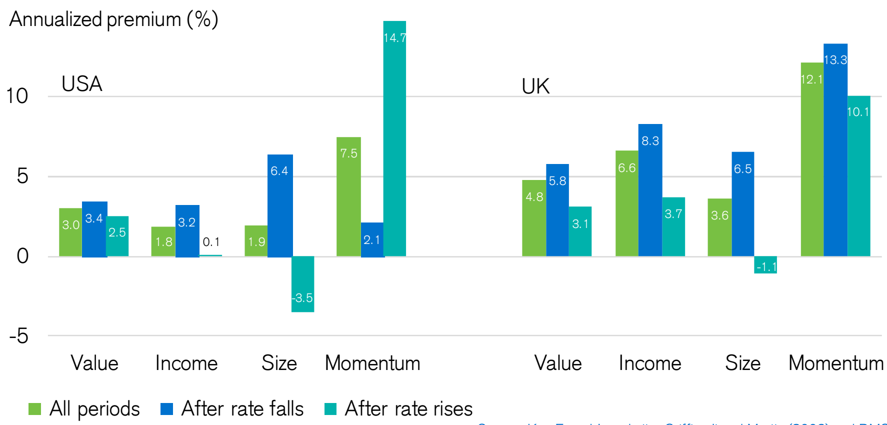
Impact of rate changes: UK industry returns, 1955–2015

Market-adjusted UK industry returns following interest-rate changes (%)



Market-adjusted industry returns are systematically in the opposite direction during rising and falling rate periods

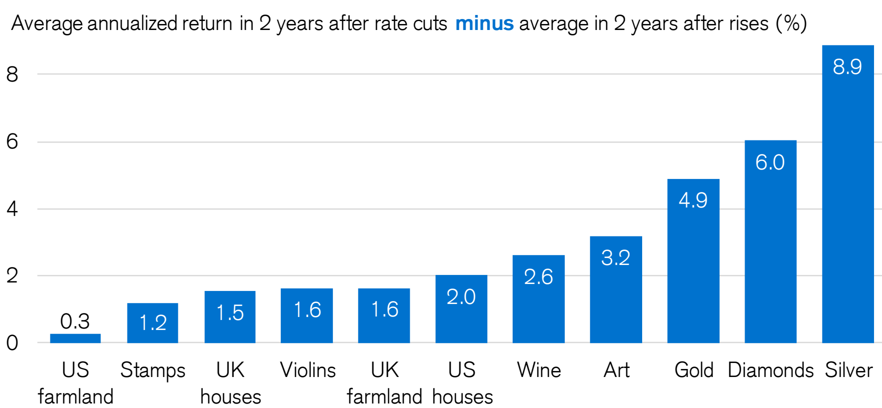
Impact of rate changes on factor returns



Source: Ken French's website; Griffin, Ji and Martin (2003) and DMS

Premia (especially size) tend to be lower when rates are rising

Impact of rate changes on real assets over 116 years



Real asset returns are higher after rate falls than after rate hikes

Summary and discussion

- On average, investors correctly anticipate interest rate changes
- US equities beat bills by 8.8% during easing, 1.8% during tightening
- UK equities beat bills by 7.6% during easing, 0.0% during tightening
- Industries respond consistently to interest rate rises and cuts
- Factor risk premia are also smaller during tightening
- Like financial assets, ‘real assets’ are sensitive to hikes and cuts

Interpretation

- Interest rates tend to rise when the economy overheats
  - Growth may be unsustainably high, and inflation may be a worry
  - Central bank interest rate hikes can confirm such concerns
  - One might expect investing when rates rise to be initially unprofitable
- But why is investing throughout the hiking cycle so unrewarded?
  - Don't investors learn? They should anticipate impact of future hikes
  - Maybe lower returns are due to the illness (unsustainable growth, inflation)
  - If the cure (rate hikes) has to continue, we learn that the patient is still unwell

Caveats

- The averages conceal considerable variation between cycles
  - "Each time is different"
- During 40% of US hiking cycles
  - Equities performed better than in the preceding easing cycle
- The relationships held in both halves of the 102-year period
  - But were stronger in the first 51 years
- Over the last 30 years, bonds did better during tightening cycles
  - But this was a golden age for bonds, when ERP vs bonds was zero
  - Even 30 years is too short a period to generalise
- Asset prices are influenced by many factors, not just interest rates

The Great Divergence?

- The Fed has taken first steps towards tighter US monetary policy
  - Japan, China, UK and ECB have ramped up QE and eased interest rates
  - We now face the "Great Divergence" between central bank policies
- Does this translate into sharply differing expected asset returns?
  - Asset returns are quite correlated and likely to remain so
  - Public knowledge is already impounded in stock and bond prices
  - It is surprises in central bank policies that impact asset prices
  - To win, you need to be prescient about future monetary policy

Strategy

- Low returns are a global challenge
  - Like short-term interest rates, bond yields are low
  - Equities do not offer a larger risk premium when interest rates are low
  - Historically, low real rates have heralded low real asset returns

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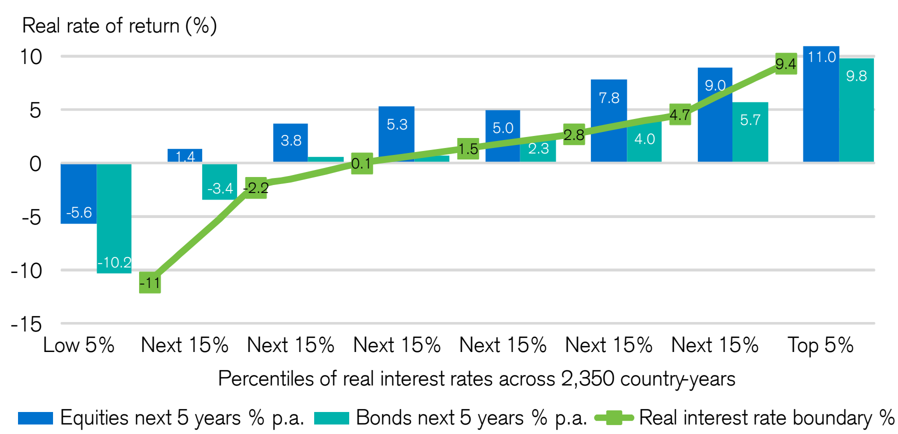
Real asset returns versus real interest rates



Low real rates heralded low real asset returns and vice versa

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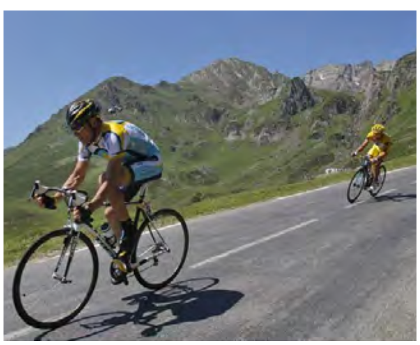
Strategy

- Low returns are a global challenge
  - Like short-term interest rates, bond yields are low
  - Equities do not offer a larger risk premium when interest rates are low
  - Historically, low real rates have heralded low real asset returns
- Support for tactical asset allocation?
  - Contracyclical securities are rare; market rotation is costly
  - To raise expected returns, investors typically have to take more risk
- Long-term investors should stress diversification
  - They should plan for lower returns in the future than in the past
  - They should focus on time in the market. Not on timing the market

Conclusion

We can cycle downhill
(when rates are falling)



Or we can cycle uphill
(when rates are rising)

Our principal finding: It's more enjoyable to cycle downhill than uphill