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**Financial markets and monetary policy implementation – an
evolving relationship**

Money Market Event

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Ladies and gentlemen

Welcome to the SNB's Money Market Event in Geneva. It is a great pleasure for me to be able to address you here today for the second time. Last year, my speech centred entirely around monetary policy itself. Today, I would like to focus on its implementation in the financial markets.

As you know, central banks in the advanced economies have expanded their monetary policy toolkits considerably since the peak of the global financial crisis in 2008. This has changed the way in which they act on the financial markets. Traditionally, the money market interest rate has been the key monetary policy variable. In the last few years, central banks have used unconventional measures to exert a more or less direct influence on other financial market prices as well. This was and is the only way to fulfil their mandate in difficult times. As a result, central banks today focus more than they used to on developments in the financial markets.

The Swiss National Bank, too, has deepened its understanding of the markets, refined its analytical tools and strengthened its market contacts. I will say more about that later in my speech. First, I would like to talk about the expansion of the monetary policy toolkit and what that involves. In the final part of my speech, I will offer a few thoughts on the extent to which unconventional monetary policy measures have changed the interactions between monetary policy and the financial markets.

Monetary policy transmission using only a single instrument

In principle, monetary policy influences economic and price developments via the banking system and the financial markets, since a central bank conducts its monetary policy by using its monetary policy instruments to target certain prices on the financial markets. Monetary policy stimuli are thus transmitted via the financial markets to the economy. The choice of instrument is dictated by the monetary policy framework.

In the pre-crisis era, so up to about 2007, central banks were in general agreement about what makes a good monetary policy framework. It should be simple, clear and straightforward; in practice, there was, in particular, a consensus that monetary policy should be implemented using only a single instrument. This was usually a short-term interest rate steered more or less directly by the central bank. Monetary policy had only an indirect influence on all other financial market prices, because they depended on the short-term rate.

This idea had also come to hold sway in this country. **Chart 1** shows the transmission process on which the SNB's traditional monetary policy framework was based. Until the beginning of 2009, the three-month Swiss franc Libor was the only price that was directly steered by the SNB through its monetary policy operations. Via this short-term rate, monetary policy stimulus was transmitted to the economy through various channels – including interest rates, credit, exchange rates and asset prices.

Expansion of the monetary policy toolkit post-crisis

As the financial crisis unfolded, this all changed. Starting in autumn 2008, central banks – including the SNB – rapidly cut short-term interest rates to historically low levels of or close to zero. Conventional monetary policy had reached its limits, at least according to the prevailing view at the time. But the options for monetary policy were not yet exhausted. Instead, all the major central banks expanded their monetary policy toolkits with new measures, called ‘unconventional’ measures because they deviate from the traditional monetary policy framework and are designed to deal with unusual situations.

These unconventional measures fall into two categories: interest rate policy and balance sheet measures – measures by which a central bank exploits its opportunities to create money and thereby expand the balance sheet. Unconventional interest rate policy measures include forward guidance¹ and negative interest rates. Balance sheet measures include, in particular, quantitative easing, or QE for short, but also foreign currency purchases.²

Larger sphere of influence of monetary policy on financial markets

Unconventional measures also aim to ensure appropriate monetary conditions in the respective countries and currency areas. So there has been no change to the fundamental policy principles of ensuring price stability. What has changed, however, is the way in which central banks’ monetary policy stimuli are transmitted to the banking system and the financial markets. Using unconventional measures, central banks directly influence price-setting on those markets in which they are active. This applies especially to balance sheet measures. However, I would first like to look at unconventional interest rate policy.

Unconventional interest rate policy as a means to reinforce interest rate stimulus

Forward guidance and negative interest rates pick up where conventional interest rate policy stops. We can see this from **chart 2**. The objective of such measures is to intensify the desired interest rate stimulus. Forward guidance is aimed at influencing medium and long-term interest rates by providing information on the expected development of short-term interest rates. Central banks have already made use of this measure in the past.³ However, since the financial crisis, some central banks have taken to explicitly announcing the period for which low interest rates would remain unchanged, or which economic conditions should be met before market participants could expect interest rates to be raised.⁴

¹ This can include the Bank of Japan’s intention to fix the yield on ten-year government bonds at around zero in future. This measure was called ‘yield curve control’.

² For a comprehensive appraisal of unconventional monetary policy measures, cf. Borio, C. and A. Zabai (2016), Unconventional monetary policies: a re-appraisal, *BIS Working Papers*, 570, pp. 2–9.

³ The SNB publishes a conditional inflation forecast that can also influence financial market participants’ interest rate expectations and therefore can also be regarded as a form of forward guidance.

⁴ Filardo, A. and B. Hofmann (2014), Forward guidance at the zero lower bound, *BIS Quarterly Review*, March 2014.

Using negative interest rates, the central banks have, to some extent, reactivated the interest rate instrument, by taking certain reference rates below zero. Since negative interest rates reinforce the expansionary impact of quantitative easing measures, some central banks introduced both measures in combination. Currently, several central banks are using negative interest rates, including the euro area, Japan and Switzerland – although at different conditions and with different features. The SNB's negative interest rate is primarily aimed at maintaining the traditional interest rate differential to the rest of the world, in order to make Swiss franc investments less attractive. The interest burden increases as soon as the SNB supplies the banking system with additional liquidity, especially through further foreign exchange market interventions. The negative interest rate and the SNB's willingness to remain active in the foreign exchange market are thus two mutually reinforcing measures, which are having the desired effect. Nonetheless, the Swiss franc remains significantly overvalued.

Balance sheet measures turn central banks into financial market players

Let me now turn to balance sheet measures. Here, the central bank enters the financial markets as a major participant. In the case of quantitative easing, or QE, it will often purchase medium and long-term government bonds with the aim of lowering the relevant interest rates.⁵ As well as government bonds, some central banks have extended their purchase programmes to include other asset classes, including asset-backed securities, covered bonds and corporate bonds. At the Bank of Japan, the purchase programme also encompasses certain equities⁶ and shares in real estate funds.

In **chart 3**, you can see that a QE programme impacts directly on a number of financial markets. This more direct influence of monetary policy on a broader segment of the financial markets is evident in the extent and impact of the QE programmes. **Chart 4** shows the impact of the QE programmes by the Federal Reserve, the European Central Bank, the Bank of England and the Bank of Japan.⁷

The chart is based on findings from a total of 24 studies which estimated the impact of each securities purchase programme on capital market rates. The blue bars show the breadth of the estimated impact of each QE programme. The red diamonds indicate the respective median. We can see that the QE programmes across the different currency areas may have reduced the yields on ten-year government bonds by over half a percentage point on average.

I now come to central banks' foreign exchange market interventions. The exchange rate is an important variable for a small open economy like Switzerland, and thus for its monetary policy. Yet the SNB only rarely intervened directly in the market in previous decades, and

⁵ In addition to the Federal Reserve, the European Central Bank, the Bank of England and the Bank of Japan have also introduced securities purchase programmes. With respect to Switzerland, the SNB's purchases of Swiss franc bonds in 2009 and the large-scale repo transactions and foreign exchange swaps concluded in August 2011 may be termed quantitative easing.

⁶ These are exchange-traded funds which replicate the TOPIX, Nikkei 225 or JPX-Nikkei 400 indices.

⁷ Andrade et al. (2016), The ECB's asset purchase programme: an early assessment, *ECB Working Paper Series*, No. 1856, September 2016.

then only with small amounts. Since March 2009, this has changed. It was at this point that the SNB began buying foreign currency on a large scale, in order to counter excessive upward pressure on the Swiss franc and prevent an undesirable tightening of monetary conditions in Switzerland. Alongside the negative interest rate, our willingness to intervene in the foreign exchange market as necessary constitutes a key element of our current monetary policy.

To sum up my remarks so far: the sphere of influence of monetary policy on the financial markets has increased markedly with the broad application of unconventional measures. In some quarters, central banks are even judged to have a decisive influence on financial market prices. Insofar as it allows monetary policy objectives to be met, this is of course, from a central bank perspective, not unwelcome. Ultimately, the aim of all monetary policy measures is to ensure the effective transmission of monetary policy stimuli to the economy. This applies especially in exceptional times such as those we have experienced in recent years, marked by modest and fragile economic and price developments worldwide.⁸

Significance for the implementation of monetary policy

With the deployment of unconventional measures, implementation of monetary policy has become considerably more challenging.⁹ This also applies to the SNB. First and foremost, we needed to gain a deeper understanding of the markets and refine our analytical tools. We have put a great deal of effort into these areas over recent years, as I will now illustrate with a few examples.

Challenges in implementing negative interest

Turning to the implementation of negative interest first. As you know, at the beginning of 2015, the SNB started charging interest of -0.75% on sight deposits held by banks and other financial market participants at the SNB.

There are a number of challenges in implementing negative interest rates, three of which I will briefly outline here. First, the potential for interest rate reductions further into negative territory is limited by the effective lower bound. This is determined, among other things, by the cost of holding cash. It is not possible to determine precisely where this lower bound lies, but we are confident that we still have some room for manoeuvre to lower interest rates further, if necessary.

Second, the transmission of negative interest to the financial system and the economy has some peculiarities. In our experience, the transmission to the money and capital markets of an interest rate change in negative territory operates in the same way as one in positive territory.

⁸ For instance, a study by the International Monetary Fund shows that the unconventional measures taken by the Federal Reserve at the height of the financial crisis played a decisive role in calming the markets. Cf. Roache, S. K. and M. V. Rousset (2013), Unconventional monetary policy and asset price risk, *IMF Working Paper*, WP/13/190, August 2013.

⁹ For the lessons learnt from the financial crisis and proposals for future monetary policy frameworks, cf. Bindseil, U. (2016), Evaluating monetary policy operational frameworks, paper presented at the Economic Symposium of the Kansas City Fed, Jackson Hole, August 2016.

An example of this is the continued efficient operation of the repo market. By contrast, the transmission of negative interest in the banking system is varied. As interest rates on bank deposits largely remain at zero, lending rates, particularly mortgage rates, have also fallen less sharply than money and capital market rates. From the SNB's perspective, this imperfect transmission to lending rates is not entirely unwelcome in the current economic environment. It has helped to ensure that the risks to financial stability associated with a persistent low interest rate environment have so far not increased to any significant degree since the introduction of negative interest. It is therefore all the more important for monetary policy purposes that we thoroughly understand the transmission mechanisms of negative interest. We have therefore extended our analyses in this area and are in regular contact with the relevant market participants.

Third, as far as the impact of negative interest on investors is concerned, varying levels of risk appetite are observed. Domestic investments appear to be particularly popular. In international capital flows, we are continuing to see a strong aversion to risk among domestic investors. Current account surpluses in the economy are generally converted into Swiss francs and no longer invested abroad. This contributes significantly to the strength of the Swiss franc. From a monetary policy perspective, increased willingness on the part of major investors to take additional risks would certainly be desirable.

Focus shifted to the foreign exchange market

Let me turn now to the foreign exchange market. As I mentioned already, the SNB started to make large-scale purchases of foreign currency against Swiss francs in 2009. Naturally, the foreign exchange market is therefore of great interest to us. We are active in the foreign exchange market at all market hours. This is a particular challenge. After all, it is a global market and trading takes place round the clock. Needless to say, we have built up the relevant capacities and necessary know-how in this area.

But the changes go much deeper. In simple terms, the growing importance of the exchange rate instrument has meant that the SNB has had to catch up rapidly with the structural changes that have taken place in the foreign exchange market in recent decades, especially in relation to the introduction of electronic trading. As you probably know, transactions on the spot and foreign exchange swap markets are now largely conducted on electronic platforms. Since 2010, we have been carrying out virtually all our foreign exchange transactions on such platforms.

Electronic trading has made the foreign exchange market faster and more transparent. For instance, live streaming of prices enables market participants to precisely determine the price and the market conditions before a transaction is conducted. In order to take account of these changes, we use the latest techniques to carry out our transactions and implement our trading strategies. Electronic trading also brings advantages for the *ex post* analysis of transactions. For example, we are able to closely monitor individual foreign exchange transactions to gain insights into their effects and adapt our approach as necessary.

Overall, the foreign exchange market today is much more decentralised and the market participants far more heterogeneous than before. This means that the number and variety of market contacts required in order to understand the foreign exchange market and the demand for Swiss francs has also increased. Like other central banks, we too are committed to establishing a standard for worldwide rules on foreign exchange market practices. Within the framework of the Swiss FX Market Roundtable, a broad spectrum of market participants has been working with the SNB to develop a global standard 'FX Code of Conduct'. I would like to take this opportunity to thank these market participants for their contributions.

Longer-term correlation between monetary policy and financial markets

Ladies and gentlemen, I now come to the last part of my speech, where I would like to talk about the longer-term interactions between monetary policy and financial markets. Through their monetary policy measures, central banks influence financial market prices. To what extent this influence is stronger today than it used to be is the subject of a number of studies.

Indeed, we observe that some traditional relationships and correlation patterns on the financial markets have changed in recent years. This is illustrated in **chart 5**. It shows the correlations between the prices of seven asset classes, including equities, government bonds, corporate bonds and commodities. The blue bars show the distribution during the period 2000 to 2007, before the financial crisis and during a period of conventional monetary policy, while the red bars depict the observed distribution since 2010. It is clear that the correlation between asset prices has significantly increased since 2010.

There are various explanations for why financial market prices globally are moving more in unison. A major reason is likely to be the advanced globalisation of the money and capital markets and increasingly parallel international economic and price developments. Another cause may well be unconventional monetary policy measures, in particular the extensive QE programmes, which have caused bond and equity prices to rise simultaneously. Ultimately, large-scale securities purchase programmes lead to lower interest rates and reduce the supply of risk-free assets. This, in turn, leads investors to rebalance their portfolios towards riskier asset classes such as equities – which, from a monetary policy transmission standpoint, is certainly desirable.¹⁰ In the end, rising asset prices should stimulate consumption and investment, as well as consumer prices.

A related issue is the degree to which higher equity prices in the current situation can be interpreted as a sign of an improving economic and profit outlook. It is intuitively obvious that corporate earnings and equity prices move in unison – at least in the longer term – and are therefore positively correlated. However, for some time now, we have observed a negative correlation – while both actual profits and expectations have declined, equity prices have risen to new record levels, as depicted by the yellow lines. **Chart 6** shows the US S&P 500 equity

¹⁰ Lower interest rates also lead to higher equity prices as they reduce the discount factor for future dividends.

index (blue line) and the corporate earnings per share expected for the next 12 months (red line).

On the basis of these observations, it is occasionally concluded that some financial market prices have become completely disconnected from the real economic environment and, as it were, react only to monetary policy. As a result, unexpectedly bad news from the economy is received as good news for the equity markets because investors interpret the unexpectedly weak economic data as an indicator of continued expansionary monetary policy.

However, this phenomenon is only marginally more common today than it was before the financial crisis. You can see this in the following chart, which shows the deviations of new jobs in the US each month (non-farm) from the respective consensus expectations of market participants and the immediate reactions of the equity markets (**chart 7**). The horizontal axis depicts the surprises in employment figures in thousand jobs, and the vertical axis the reaction of the equity market. The panel on the left shows the situation during the upswing from 2001 to 2007, and on the right, you can see the same picture for the upswing from 2009 to 2016. The top left quartile is key. It depicts the proportion of observations in which unexpectedly bad US labour market data coincide with positive equity market reactions. These unusual market reactions occurred in 22% of all cases before the financial crisis and in 23% of cases since 2009 – so there has been no significant increase.

Concluding remarks

Ladies and gentlemen, this brings me to the end of my speech. The implementation of unconventional monetary policy poses a number of challenges. Based on the examples of negative interest and foreign exchange market interventions by the SNB, I have shown that the requirements, scope and complexity of analyses as well as the importance of regular market contacts have significantly increased in this environment.

Unconventional monetary policy has extended central banks' reach in the financial markets, and their direct influence on various financial markets has increased. To reiterate, this is desirable from a monetary policy perspective since it helps to transmit the required monetary policy stimuli to the economy and inflation.

Just how much the activity, sometimes intensive, of central banks on the financial markets has changed traditional price relationships and correlation patterns is difficult to answer definitively. However, it is still the case that financial market prices reflect investor expectations for the future development of the economy and inflation.

I would like to thank you for your attention, and hand over to my colleague Dewet Moser.

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Money Market Event

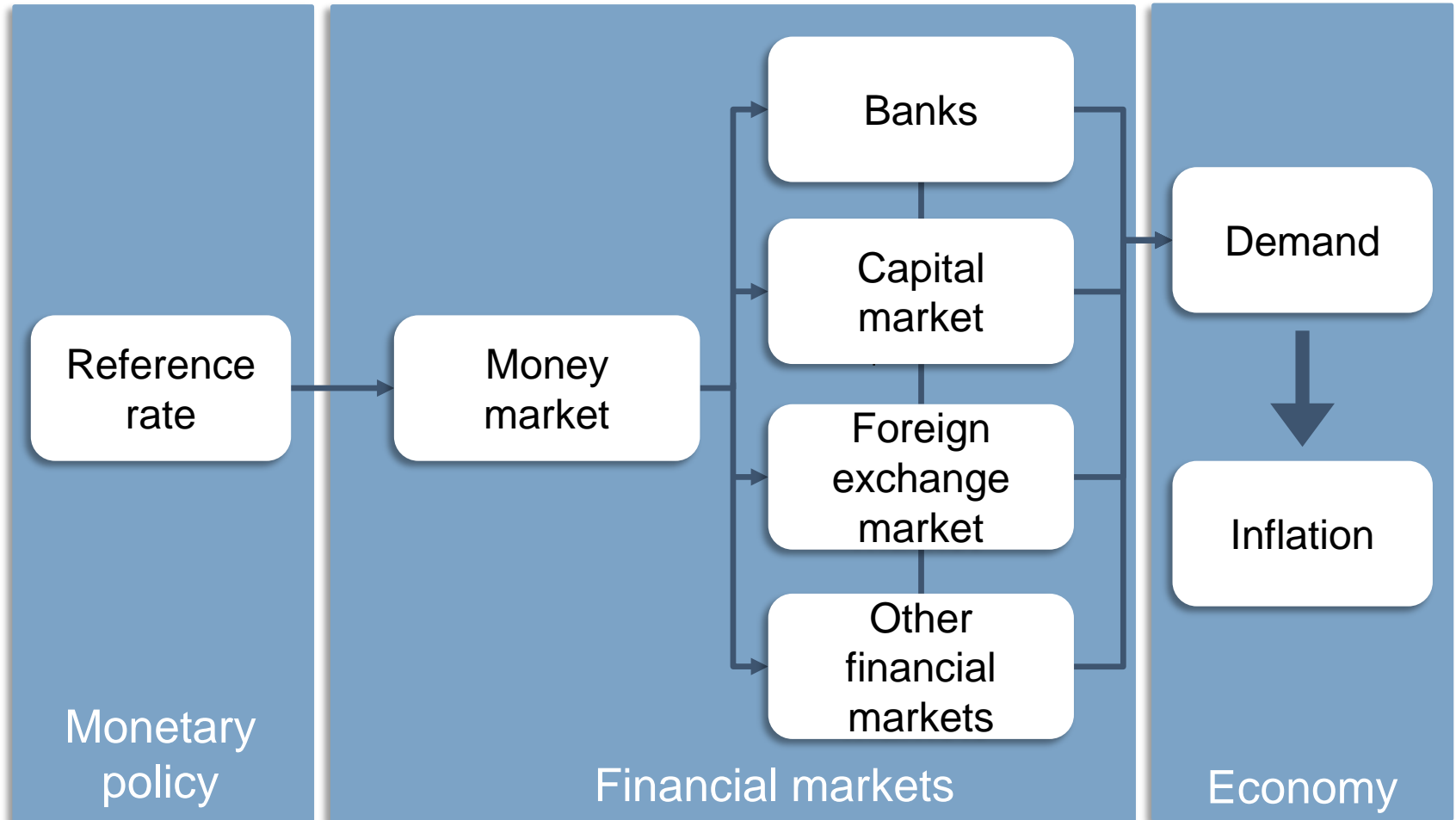
Geneva, 17 November 2016

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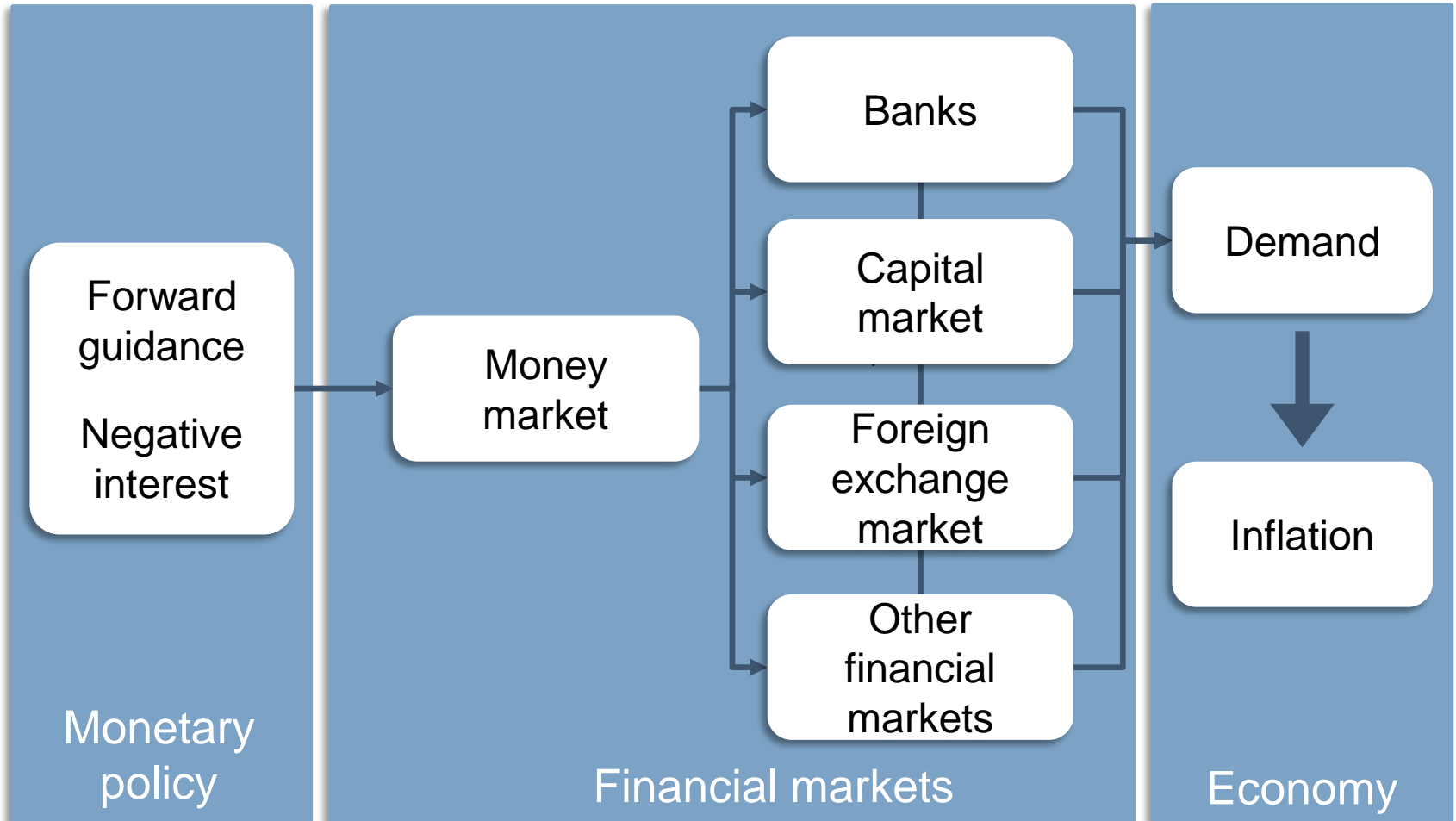
Pre-crisis monetary policy focused on steering a short-term interest rate

Conventional interest rate policy



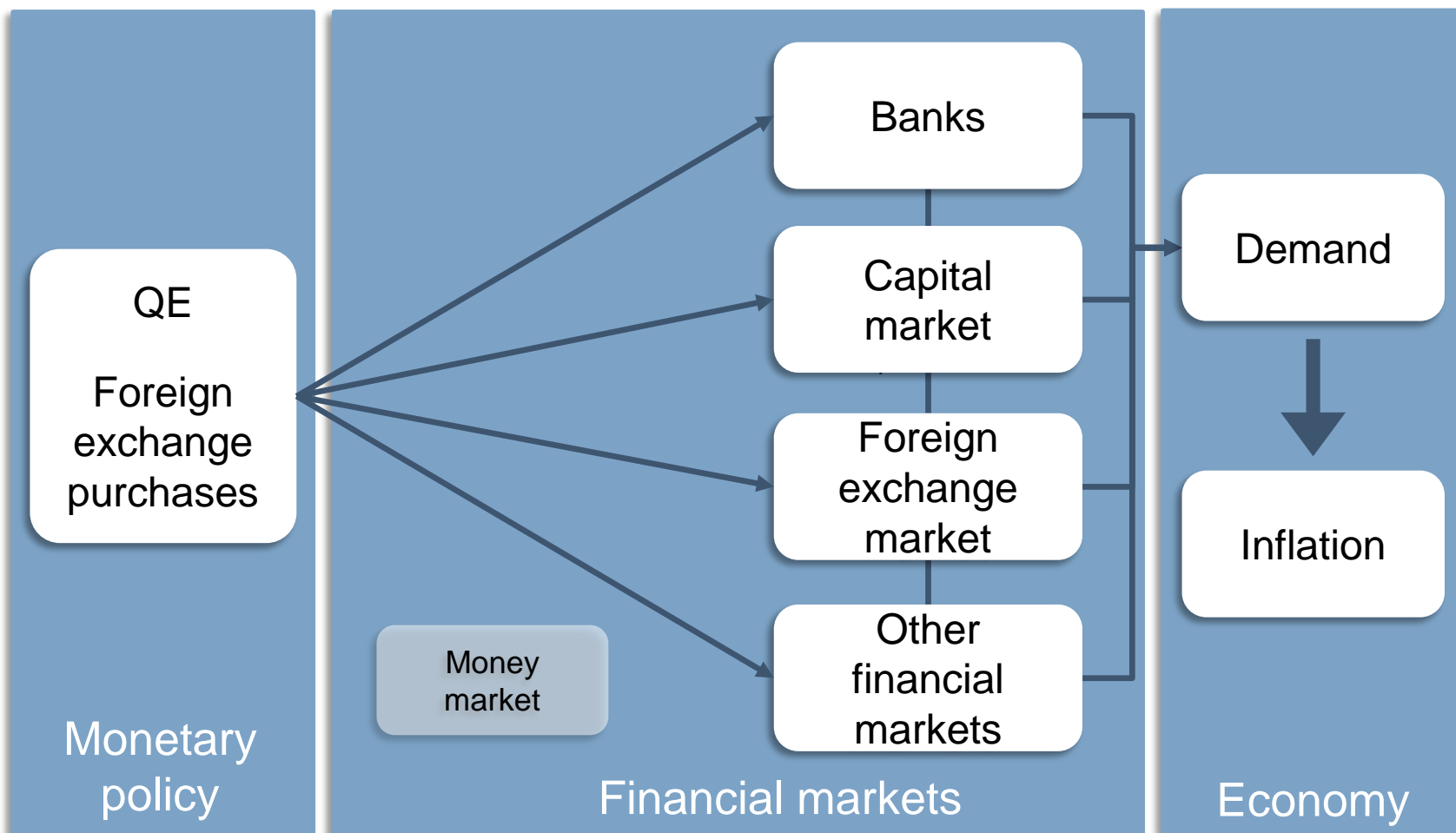
Forward guidance and negative interest aimed at strengthening monetary policy transmission

Unconventional interest rate policy



Quantitative easing and foreign currency purchases directly influence various financial market prices

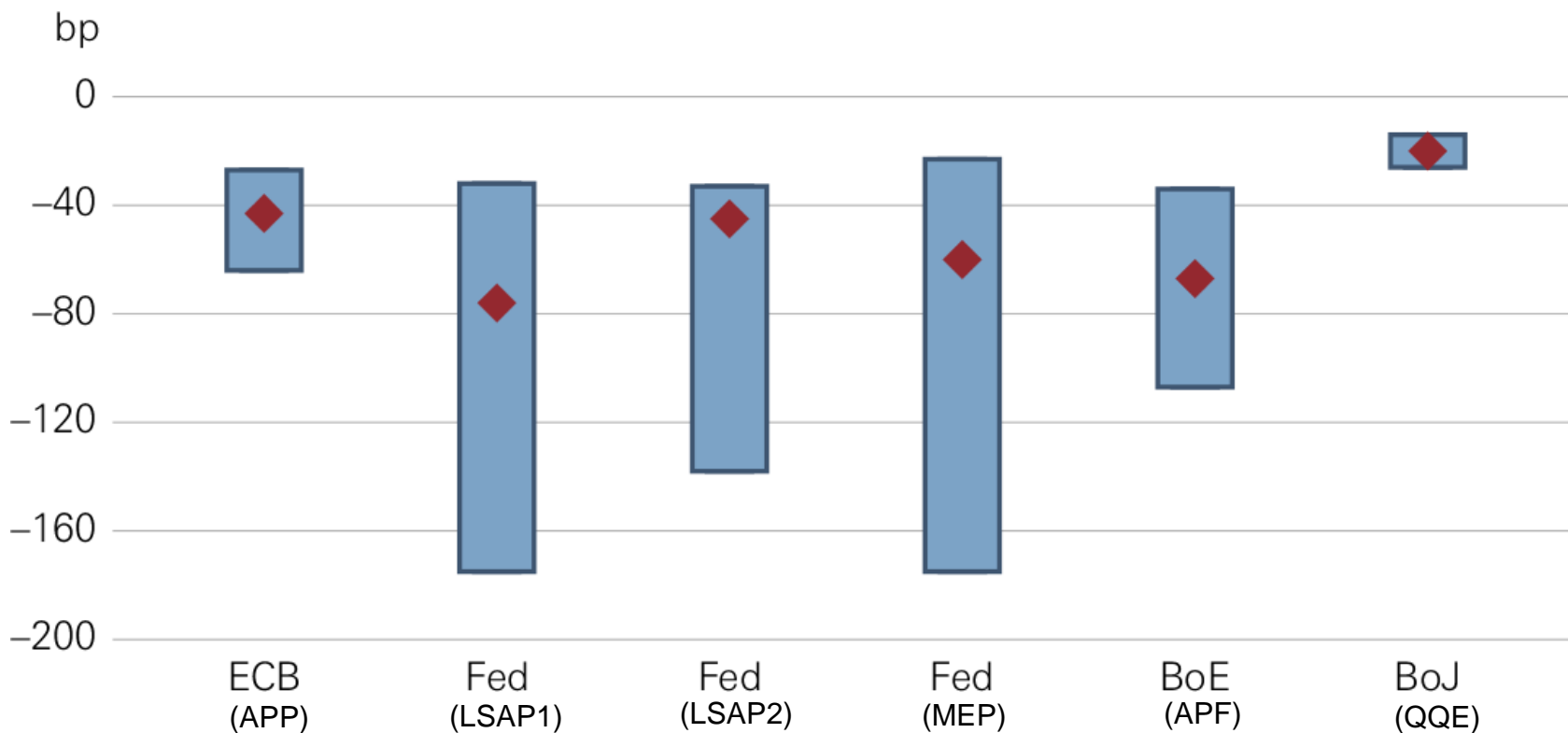
Balance sheet-related measures



Central banks further reduced long-term interest rates by purchasing government bonds

IMPACT OF QE ON 10-YEAR GOVERNMENT BOND YIELDS

Range of estimates from 24 different studies



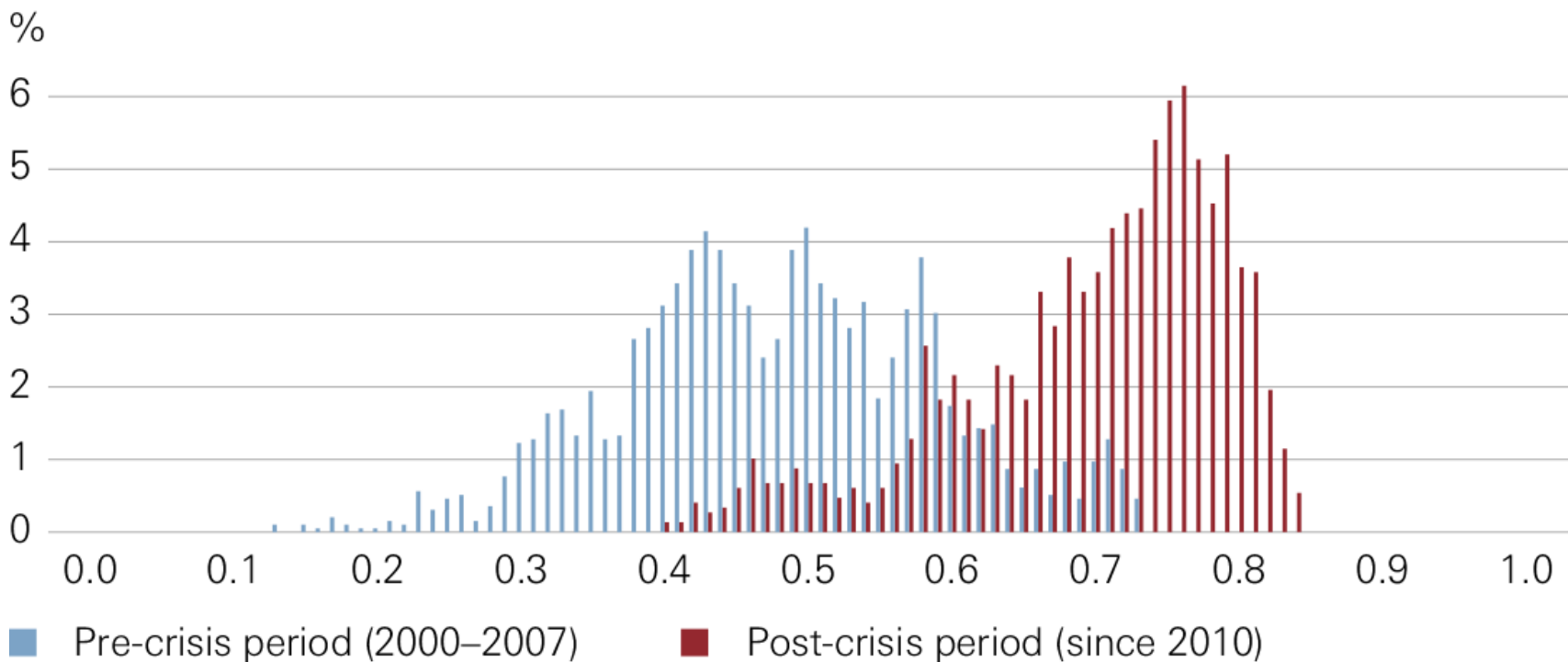
APP = Asset Purchase Programme, LSAP = Large Scale Asset Purchases, MEP = Maturity Extension Programme, APF = Asset Purchase Facility, QQE = Quantitative and Qualitative Easing

Sources: Andrade et al. (2016), SNB

The different asset classes are more strongly correlated today than before the crisis

CORRELATIONS OF GLOBAL ASSET CLASSES

Frequency distribution of correlation coefficients*

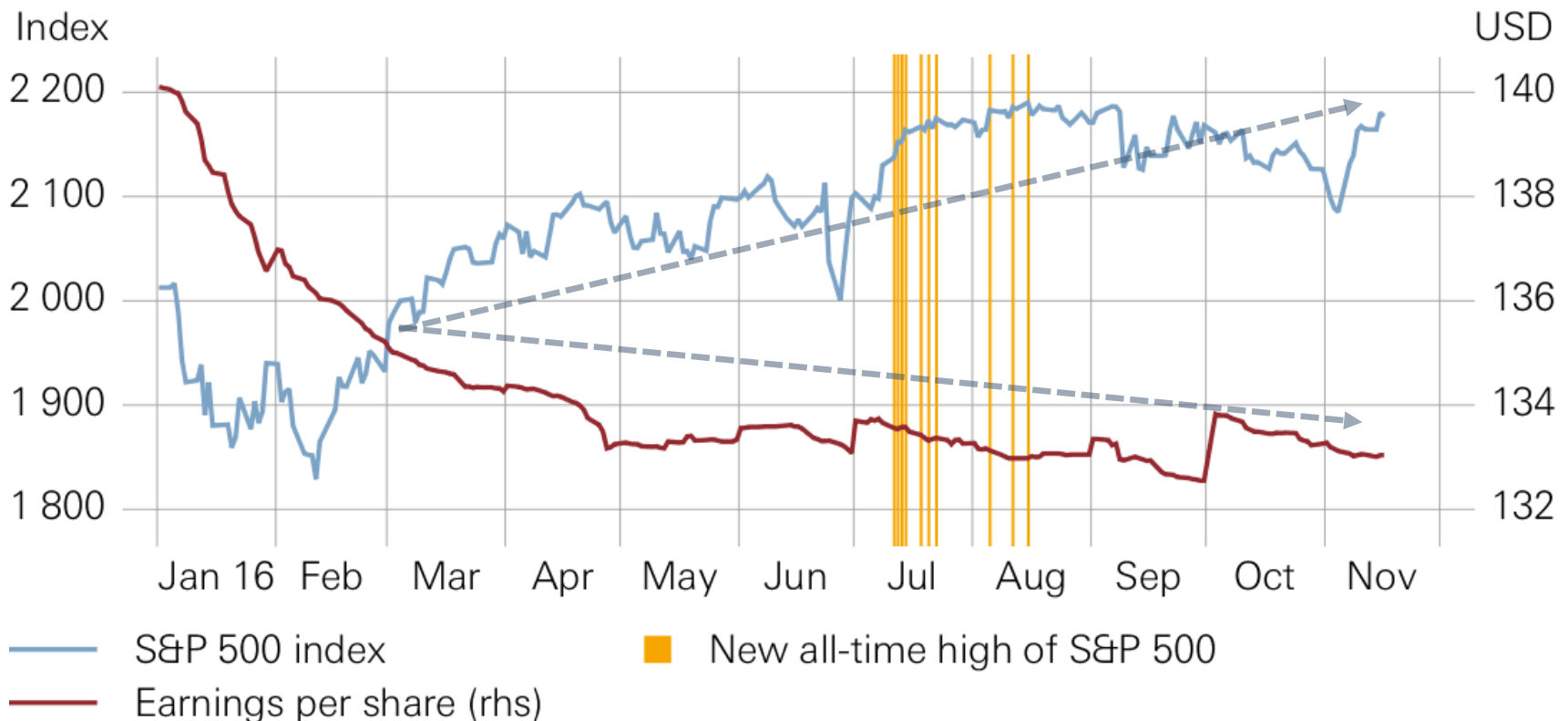


* Based on equities, government bonds, corporate bonds and commodities

Equity prices in the US reached new highs despite falling earnings expectations

US EQUITY INDEX AND EXPECTED EARNINGS

Index value and expected earnings per share for next year



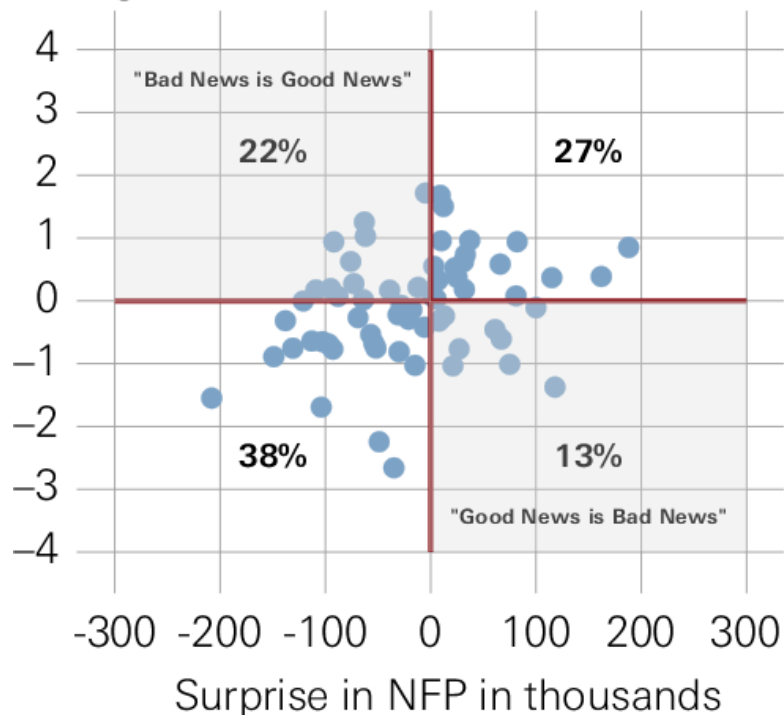
Sources: Bloomberg, SNB

Little change in US equity market's pre and post-crisis reaction to news

US EMPLOYMENT REPORT AND EQUITY MARKET REACTIONS

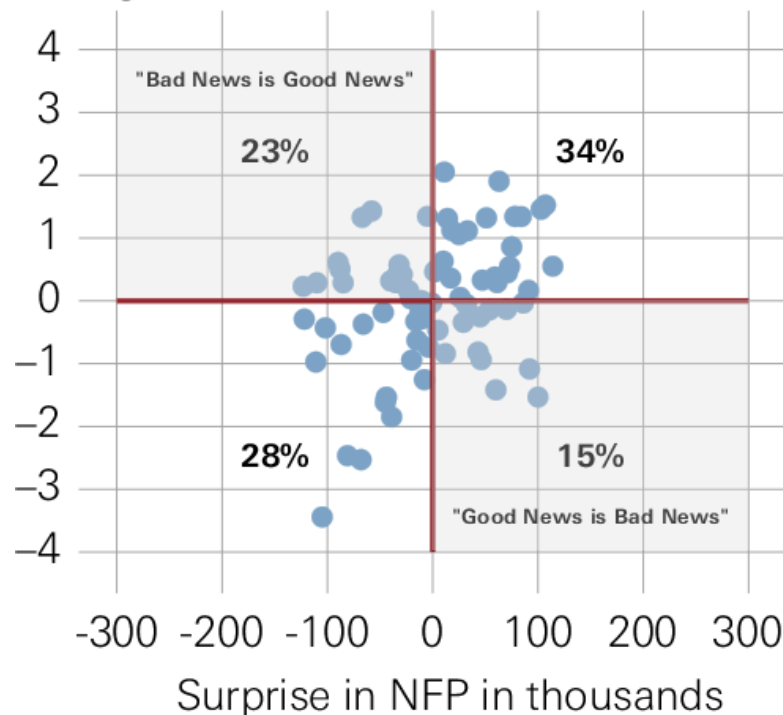
December 2001 to November 2007

Change in S&P 500 in %



July 2009 to October 2016

Change in S&P 500 in %



Sources: Bloomberg, SNB

Thank you for your attention

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