



EUROPEAN CENTRAL BANK

EUROSYSTEM

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Asymmetries in euro area bank stock price responses to news: bad luck or bad preparation?

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*“Bank regulation, bank risk and the
wider economy”*

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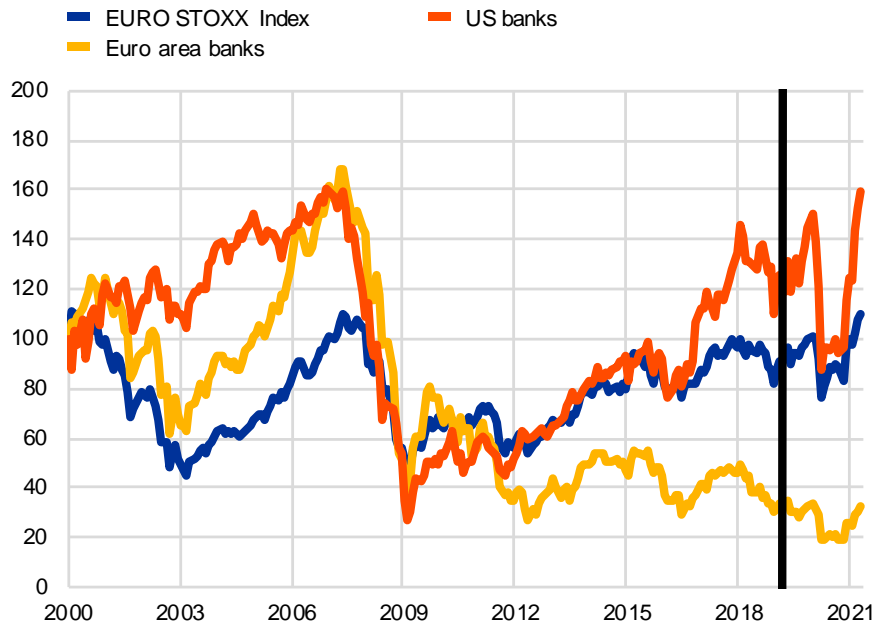
Overview

- 1 Introduction
- 2 Methodology and data
- 3 Related literature
- 4 Asymmetries and the dividend discount model
- 5 Empirical results
- 6 Concluding remarks

1. Introduction

This paper attempts to shed light on the poor performance and high volatility of euro area bank stocks over the past two decades

EURO STOXX index, euro area and US banks
(Jan 2000 to May 2021, monthly observations)



Sources: Bloomberg and authors' calculations.

Notes: All equity prices have been indexed to 100 Jan 2000. The vertical line (March 2019) marks the end of the sample in our empirical analysis.

Estimated "beta" of euro area bank stocks
(Jan 2001 to May 2021, weekly observations)



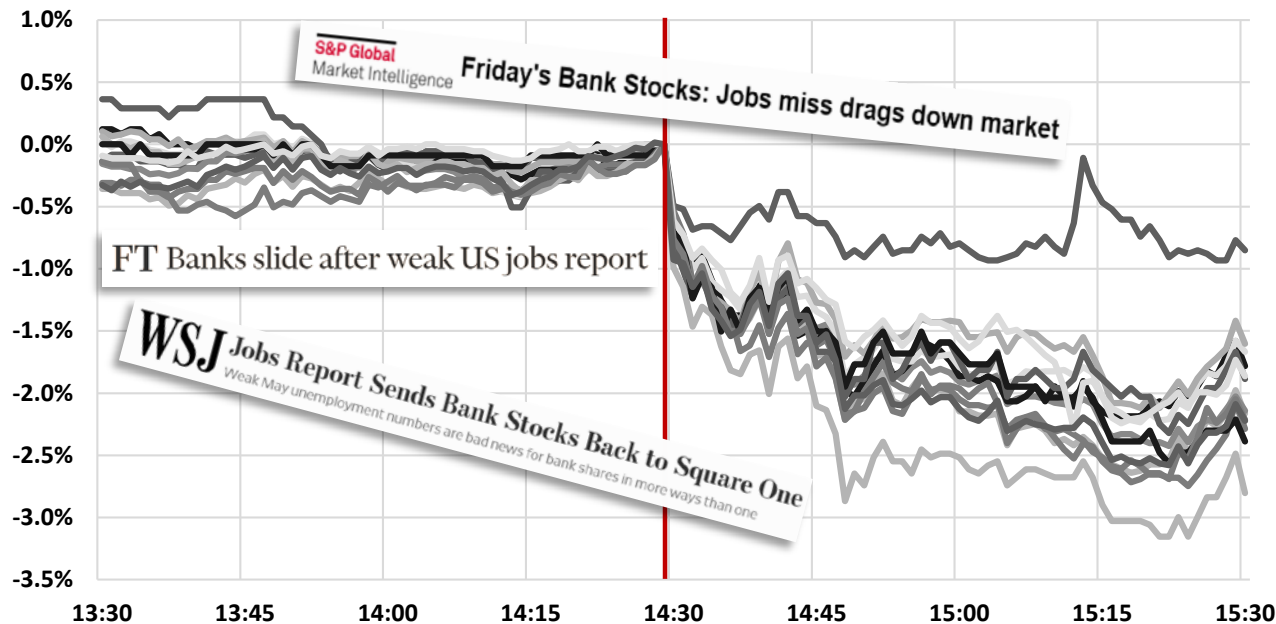
Source: Bloomberg and authors' calculations.

Notes: The betas are based on one-year rolling windows. The vertical line (March 2019) marks the end of the sample in our empirical analysis.

1. Introduction

We use macro news surprises and gauge their impacts on intraday stock price data. This enables us to “isolate” exogenous shocks.

Impact of US non-farm payroll release on 3 June 2016 on euro area bank stock price returns (in percent)



Source: Thomson Reuters Datascope.

Notes: The vertical line denotes 14:30 on 3 June 2016, the moment of the release of the May 2016 non-farm payroll report. Individual bank stock prices are indexed to zero at the time of the release of the report. The sample of banks is aligned with the sample we use in the empirical part of the paper.

"Luck is what happens when preparation meets opportunity"

--Lucius Annaeus Seneca (Roman Philosopher, 5BC – 65 AD)

Why have euro area banks performed so poorly?

- **Bad luck?**

- Performance explained by factors outside the control of the banks: interest rate level; credit risk perception of the financial sector, and; general market uncertainty

- **Bad preparation?**

- Performance explained by bank-specific characteristics: profitability, valuation, asset quality, leverage, reliance on interest income and funding mix

- **Or both? We tackle the issue using**

- A broad set of macro news surprises
- Two decades of issuer-specific intraday data
- Broad set of P&L and balance sheet characteristics



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Data used in the study

- **Intraday dataset on stock prices**

- Source: Datascope
- 15 large euro area banks
- Sample spanning Jan 2000 – Mar 2019 (around 3.6 Mln observations)

- **News surprises**

- Source: Bloomberg
- Macroeconomic news: price and output indicators; consumer and business sentiment indices; housing and job market indicators
- 60 macroeconomic news
- Countries: US, euro area (aggregate), Germany, France, Italy, Spain
- Selection consistent with Bloomberg's ranking of „impactfulness” of news

Empirical specification

- **We compute Excess returns (vis-a-vis Eurostoxx) in 10-minute (-5/+5) windows surrounding the news**
 - This reduces the risk of estimates being contaminated by other incoming news (during a day), and;
 - Strikes a balance between market microstructure effects present in ultra high-frequency data and sampling with too long intervals
- **Panel regression framework with cross-section fixed effects and Driscoll-Kraay standard errors:**

$$R_{it} = \alpha + \sum_{j=1}^J \beta_j S_{ijt} + v_i + \varepsilon_{it}$$

- **News variable:**

$$S_{jt} = \frac{A_{jt} - E_{jt}}{\sigma_j}$$

Issues tackled in the paper

1) Examining the significance of US and euro area macroeconomic news

2) Asymmetry of the impact of news:

- i. Directional asymmetries in the response to news
- ii. Regime-dependent asymmetries in the response to news
- iii. Responses to temporally clustered news

3) Explaining stock price sensitivities – the role of external and bank-specific factors

- i. General interaction specification
- ii. Specification controlling for asymmetries in responses to news

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Macroeconomic news and the impact on asset prices

Extensive empirical literature across asset classes

- **Boyd et al., (2008)**, for stock markets, **Balduzzi et al., (2001)** for bond markets and **Andersen et al., (2003)**, for foreign exchange markets

Stock price responses to news are more complex than for other asset classes

- **Bartolini et al. (2008)** finds a strong reaction on long-term interest rates while the impact on stock prices is more difficult to predict

Limited studies examining issues-specific reactions

- **Ricci (2015)** finds that the stock prices of banks with weaker balance sheets and which take on greater risks are more sensitive to news. **Ricci (2015)** study monetary policy news.

State of the economy and macroeconomic news

Linkages between stock price sensitivities, the state of the economy and monetary policy

- **McQueen and Roley, (1993), Funke and Matsuda, (1996) or Andersen et al., (2007)**
- **Boyd et al. (2005)** find that stock market reactions to news about unemployment depend on the state of the business cycle. More specifically, during economic expansions stock prices tend to rise following the release of bad news about labour market conditions while, during contractions, bad news about the labour market causes them to fall.
- **Goldberg and Grisse (2013)** show that asset prices may also be impacted by the perceived level of uncertainty.

Asymmetric asset price responses to news

Asset price responses tend to be larger for bad news

- **Andersen et al. (2003)** finds that negative news surprises have larger impacts than positive surprises.
- The stronger reaction to negative news is confirmed by **Adams et al. (2004)** with respect to inflation news and by **Anderson et al. (2018)** when looking at a broader sample of news and applied to sectoral stock indices.
- **Conrad et al. (2002)** find that stock price responses to negative news surprises are larger during periods when asset price valuations are elevated.

Theoretical studies

- **Veronesi (1999)** shows that investors' willingness to hedge against changes in their own uncertainty about the true state of the economy causes stock prices to overreact to bad news released during good times and to underreact to good news released during bad times.
- **Schmalz and Zhuk (2019)** propose a theoretical model that links information about corporate fundamentals to the state of the economy.

Recent studies have explored computers' ability to handle abstract information

Textual analysis

- **Gidofalvi (2001)** provided evidence that the publication of news articles has weak predictability for the stock prices of 12 individual securities included in the NASDAQ index.
- **Tetlock (2007)** found that sentiment derived from articles in newspapers can help to forecast near term daily stock returns. The forecasting ability is reduced over time and vanishes for horizons beyond one week.

Now-casting methodologies

- **See Banbura et. al (2013) for an overview**
- **Burri and Kaufmann, (2020)** employs news sentiment and financial market data to construct a real time indicator of economic activity and applied it on Swiss data during the Covid 19 pandemic. The authors find that the indicator is highly correlated with macroeconomic and survey-based information.

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The Gordon (1960) dividend discount model

An infinitely-lived stock, with intertemporally constant cost of equity and dividends that grow at a constant rate can be expressed as:

$$s_t = \frac{d_1}{k - g}$$

Taking the natural log:

$$\ln(s_t) = \ln(d_1) - \ln(k - g)$$

The first and second partial derivatives are:

$$\begin{aligned} \frac{\partial \ln(s_t)}{\partial k} &= -\frac{1}{k - g}, & \frac{\partial \ln(s_t)}{\partial g} &= \frac{1}{k - g} \\ \frac{\partial^2 \ln(s_t)}{\partial k^2} &= \frac{1}{(k - g)^2}, & \frac{\partial^2 \ln(s_t)}{\partial g^2} &= \frac{1}{(k - g)^2} \end{aligned}$$

Implying convexity w.r.t. both the cost of equity and the dividend growth rate

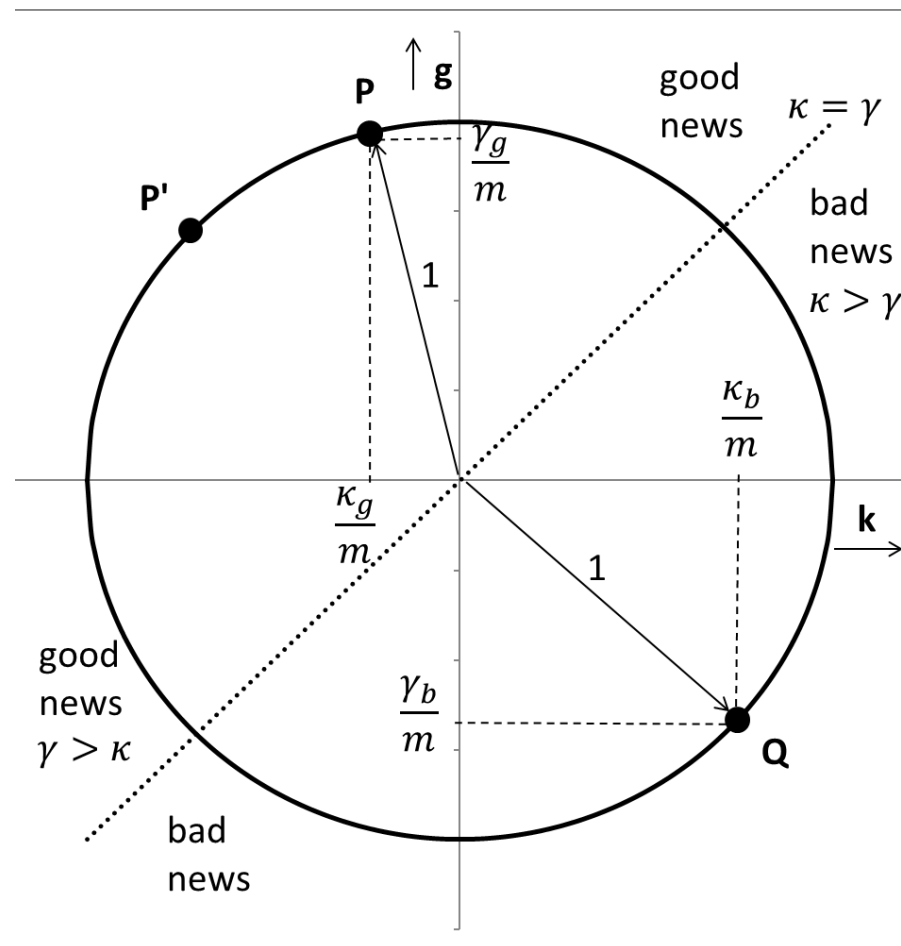
Directional asymmetry

Directional derivative

$$D_{\hat{u}}f(k, g) = -\left(\frac{1}{k-g}\right) \cdot \left(\frac{\kappa - \gamma}{\sqrt{\kappa^2 + \gamma^2}}\right)$$

Absolute difference of two directional derivatives for good and bad news:

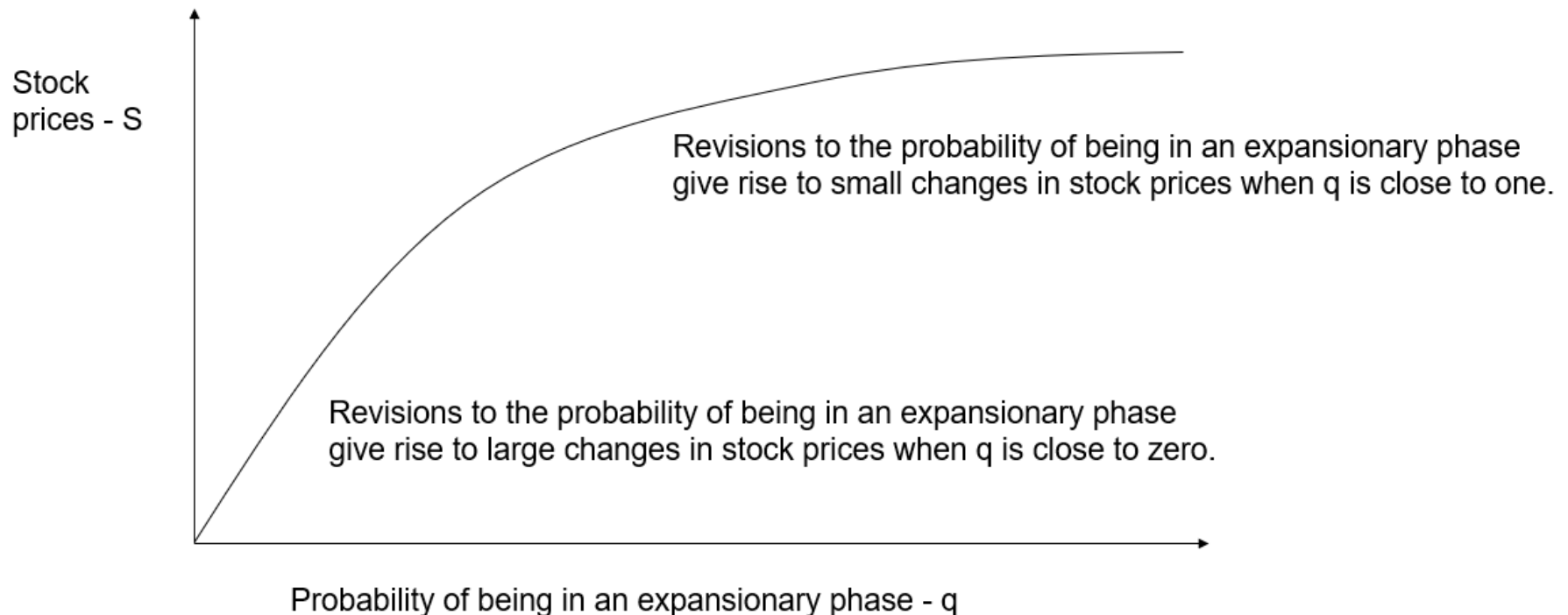
$$\begin{aligned} & \left| D_{\vec{u}_g} f(k, g) \right| - \left| D_{\vec{u}_b} f(k, g) \right| \\ &= \left(\frac{1}{k-g}\right) \cdot \left(\frac{|\kappa_g - \gamma_g| - |\kappa_b - \gamma_b|}{m}\right) \end{aligned}$$



Note: $m = \sqrt{\kappa^2 + \gamma^2}$

Regime-dependent asymmetry

Sensitivity of bank stock price to probability of being in an expansionary state



$$S_t = \frac{q d_{1,e}}{k_e - g_e} + \frac{(1 - q) d_{1,c}}{k_c - g_c}$$

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1. US and euro area macroeconomic news – which ones matter?

36 global macro announcements covered



US Non-fam payrolls *
US Initial Jobless Claims *
US GDP *
US CPI
US ISM Manufacturing *
US U-M Consumer Sentiment
US Conf. Board Cons. Conf. *
US Durable Goods New Orders
US Retail Sales *
US New Home Sales



News surprises less significant with the exception of

- euro area industrial production
- **German ZEW**
- **Italian retail sales**

Why do US news surprises dominate?

- Leading indicators of global growth and monetary policy expectations
- US data releases are timely
- EU banking system has an over-exposure to the US, see **Schoenmaker and Wagner (2013)**

2. Asymmetry of the impact of news

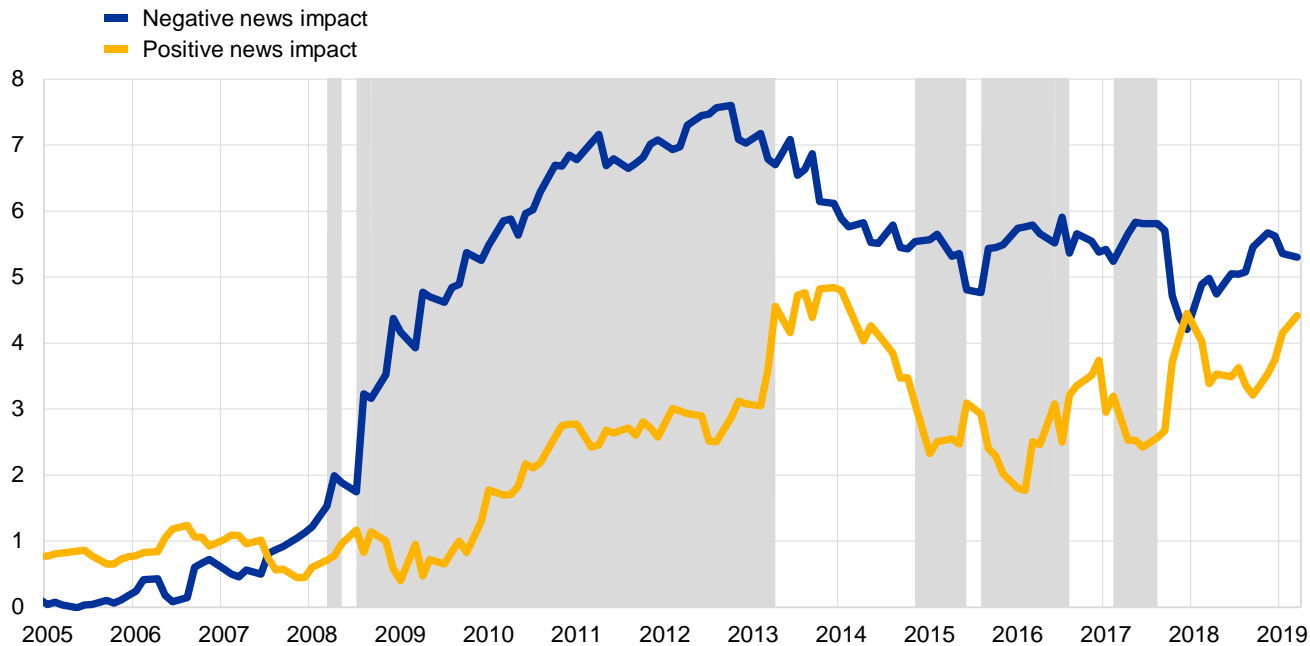
2.1 Directional asymmetries in the response to news

	(1) Model with sign asymmetry	(2) Model without sign asymmetry
<i>US Negative News</i>	3.7***	
<i>US Positive News</i>	1.8***	
<i>US News</i>		2.79***
Constant	1.3**	0.61**
Observations	26550	26550

Notes: Pooled US news variable. Coefficients are reported in basis points. * denotes significance at 10% level, ** at 5% level, and *** at 1% level, based on Driscoll-Kraay (1998) standard errors.

2. Asymmetry of the impact of news

2.2 Regime-dependent asymmetries in the response to news



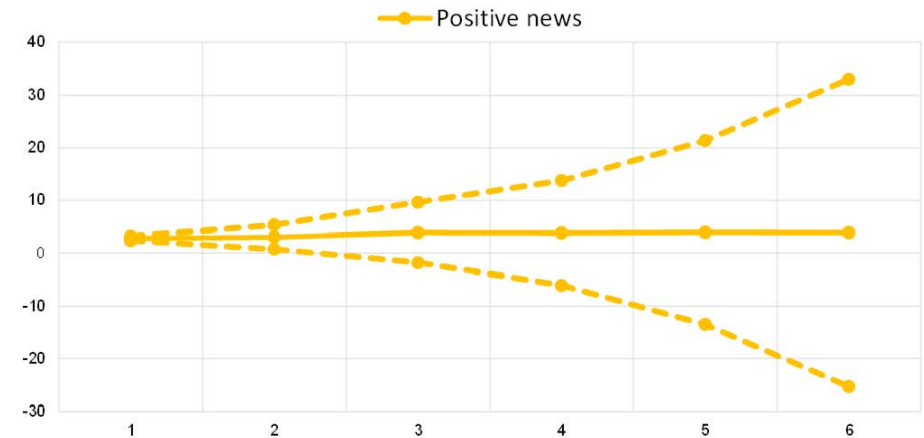
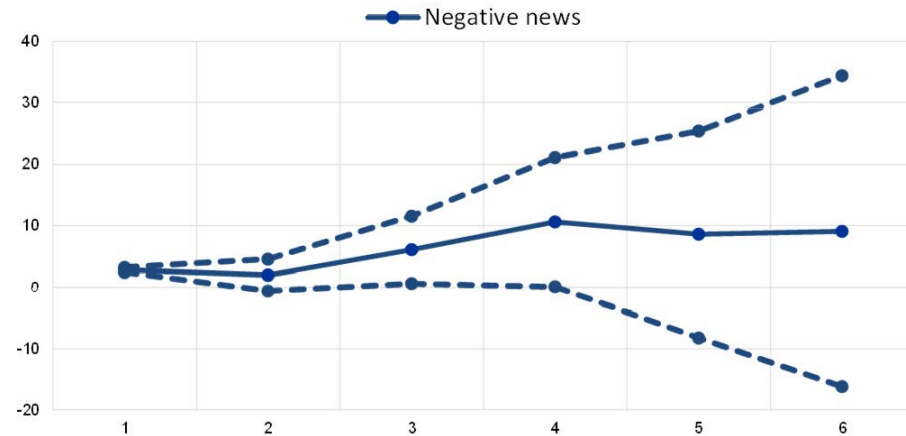
- **Asymmetric stock price responses especially pronounced during economic and financial stress**

Notes: Pooled US news variable. Impacts are expressed in basis points (excess returns). Rolling window of 400 observations. The step sizes (i.e. the number of observations dropped from the beginning of each sample and the number added to the end of the sample) are 10 observations. Shaded areas denote periods of statistically significant differences, based on Driscoll-Kraay (1998) standard errors, between the negative and positive news surprise impacts.

2. Asymmetry of the impact of news

2.3 Responses to temporally clustered news

Asymmetric (absolute) responses to clusters of news of the same sign

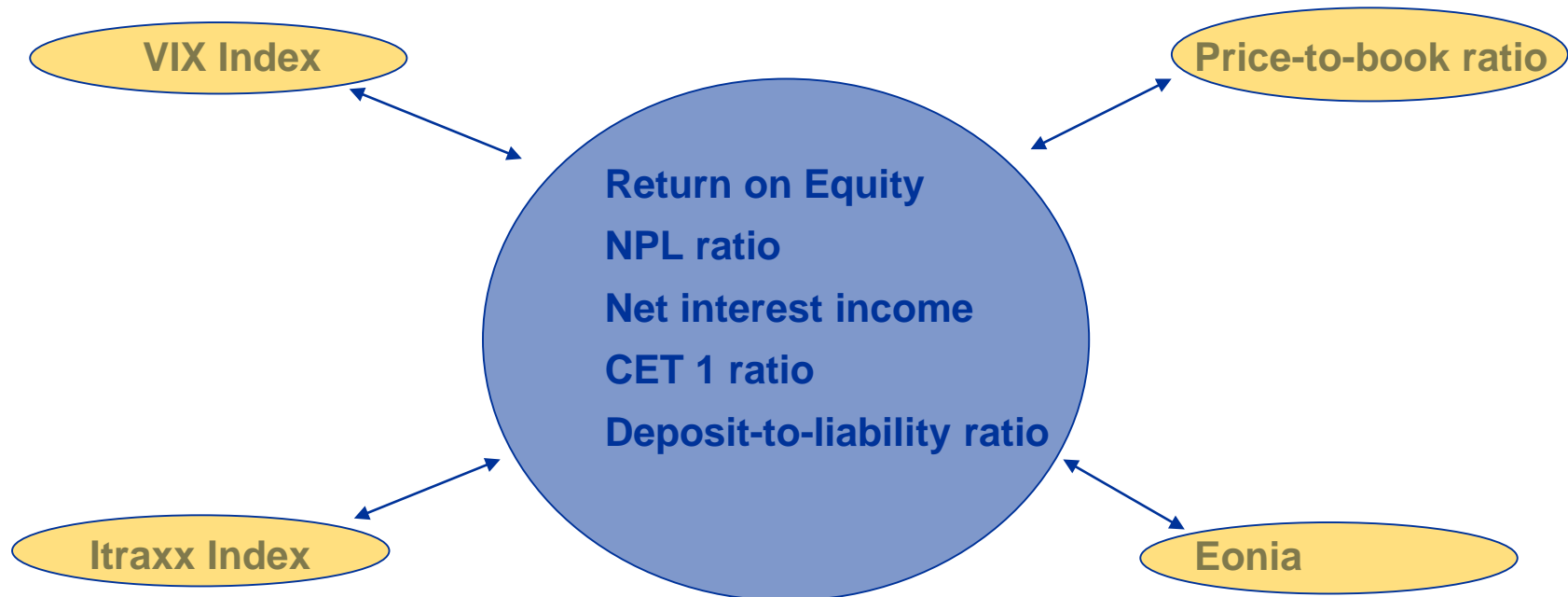


Notes: Horizontal axis: Number of consecutive news of the same sign. Vertical axis: Total impact of news (basis points) based on the pooled US news variable. Estimates from a model of the impact of news surprises with binary variables characterising cases where the n th consecutive news surprise of the same sign occurs. Dashed lines denote 95% confidence intervals.

3. Explaining stock price sensitivities

Framework

Interact the positive and negative news surprises with external (“bad luck”) and bank-specific (“bad preparation”) factors



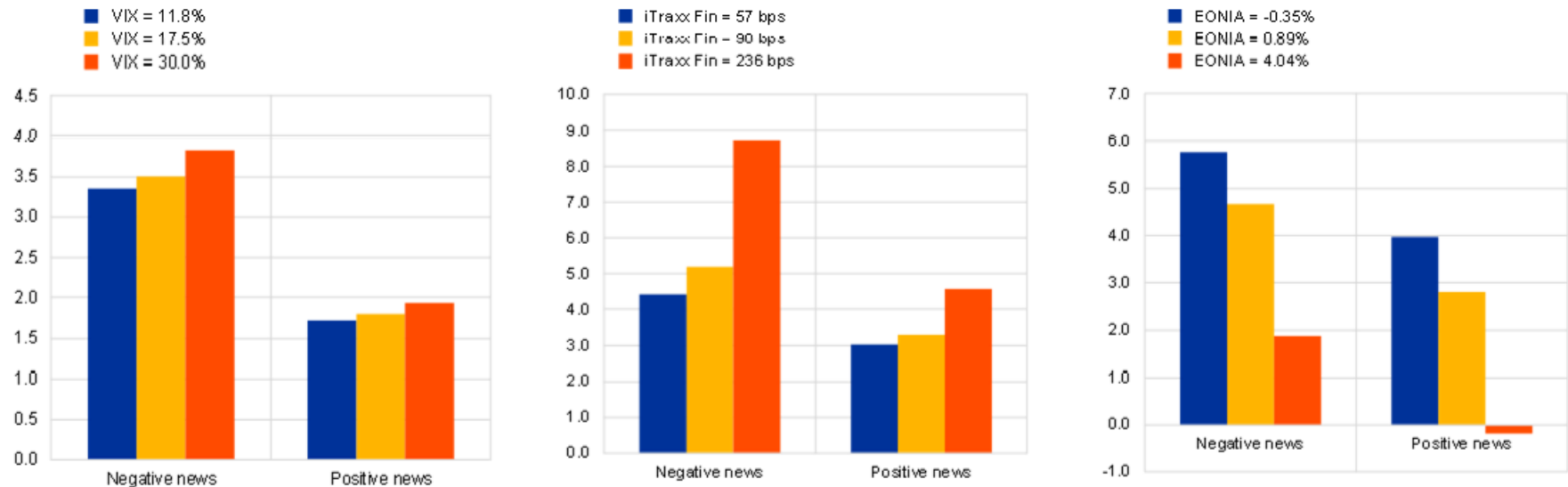
3. Explaining stock price sensitivities

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
<i>Neg.News</i>	3.68***	3.05***	3.05***	5.46***	7.82***	7.31***	3.67***	6.70***	16.46***	9.66***	21.35***	12.38**
<i>Pos.News</i>	1.82***	1.60***	2.55***	3.64***	6.05***	3.86***	0.64	2.09*	13.29***	2.84***	10.46**	5.73
<i>VIX(-1)</i>		0.03									0.08	
# <i>Neg.News</i>												
<i>VIX(-1)</i>		0.01									-0.03	
# <i>Pos.News</i>												
<i>iTraxx(-1)</i>			0.02***									0.03**
# <i>Neg.News</i>												
<i>iTraxx(-1)</i>			0.01									-0.00
# <i>Pos.News</i>												
<i>EONIA</i>				-0.89***							-4.69***	-6.88*
# <i>Neg.News</i>												
<i>EONIA</i>				-0.95***							-0.34	-1.41
# <i>Pos.News</i>												
<i>Price-to-Book</i>					-2.94***						-7.36***	-3.32
# <i>Neg.News</i>												
<i>Price-to-Book</i>					-2.63***						-5.07**	-5.60**
# <i>Pos.News</i>												
<i>Return on Equity</i>						-0.14***					0.18*	-0.17
# <i>Neg.News</i>												
<i>Return on Equity</i>						-0.11***					-0.05	-0.23**
# <i>Pos.News</i>												
<i>NPL</i>							0.46***				0.35**	0.28
# <i>Neg.News</i>												
<i>NPL</i>							0.46***				0.12	0.15
# <i>Pos.News</i>												
<i>NII</i>								-0.01			0.02	0.02
# <i>Neg.News</i>												
<i>NII</i>								0.01			0.04	0.01
# <i>Pos.News</i>												
<i>CET1</i>									-0.96***		-1.04***	-0.65*
# <i>Neg.News</i>												
<i>CET1</i>									-0.79***		-0.21	0.33
# <i>Pos.News</i>												
<i>Depo.-to-Liab.</i>										-9.66***	-4.74	-3.79
# <i>Neg.News</i>												
<i>Depo.-to-Liab.</i>									0.08		-4.09	-2.97
# <i>Pos.News</i>												
constant	1.32***	1.30***	1.38***	1.21***	1.14***	1.93***	1.80***	1.87***	1.40***	1.82***	1.75***	1.46***
Observations	26550	26550	10485	26550	20430	16398	15936	17818	11867	17719	9512	7752

3. Explaining stock price sensitivities (1/3)

Bad luck?

Asymmetric news surprise responses at different percentiles of the variables aimed at capturing the external environment

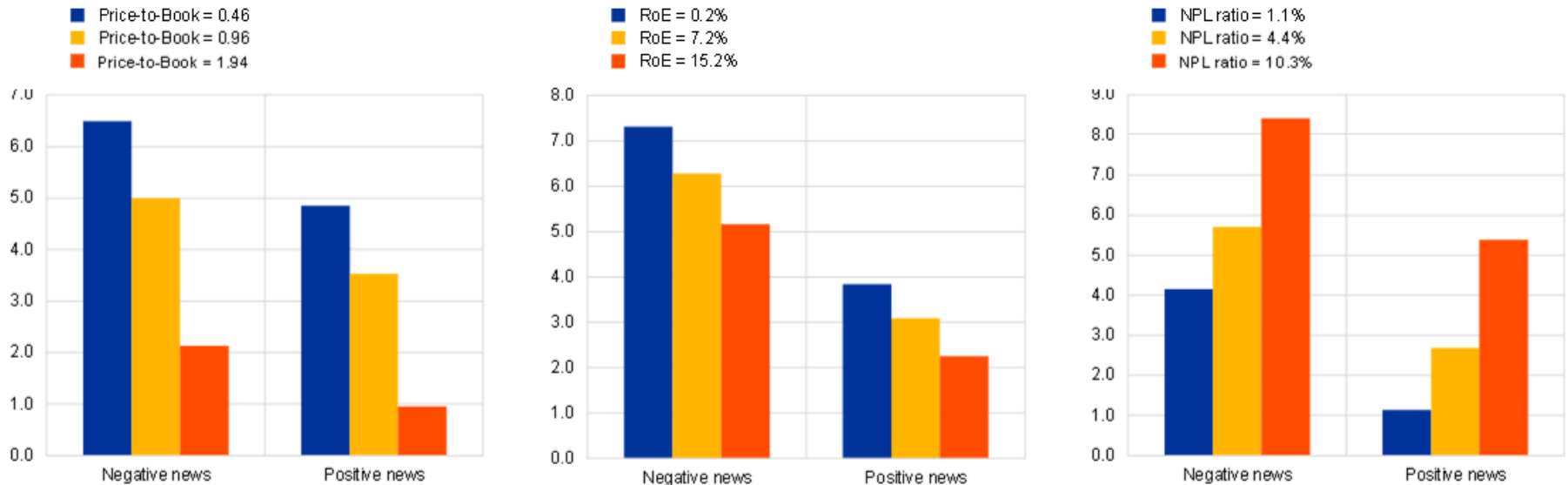


Notes: Modifying variable levels correspond to 10th, 50th and 90th percentile of its sample distribution.

3. Explaining stock price sensitivities (2/3)

Bad preparation?

Asymmetric news surprise responses at different percentiles of the variables aimed at capturing bank-specific factors

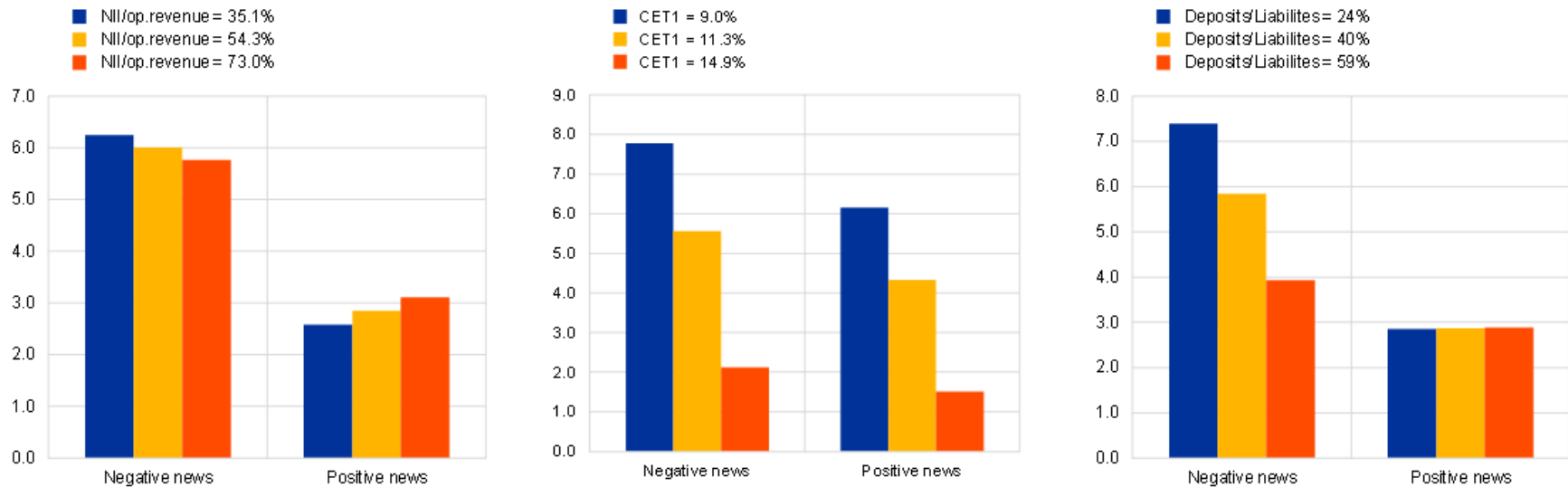


Notes: Modifying variable levels correspond to 10th, 50th and 90th percentile of its sample distribution.

3. Explaining stock price sensitivities (3/3)

Bad preparation?

Asymmetric news surprise responses at different percentiles of the variables aimed at capturing bank-specific factors



Notes: Modifying variable levels correspond to 10th, 50th and 90th percentile of its sample distribution.

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Five key conclusions:

1. US macroeconomic data releases have a more significant impact on euro area bank stock prices than any other news.
2. Bank stock price sensitivities are directionally asymmetric: negative news surprises almost always lead to larger absolute changes in stock prices than good news surprises.
3. Regime-dependent asymmetries of bank stock price responses to news are also evident, while amplification from clustering of bad news suggests the two types of asymmetry compound one another
4. Asymmetric reactions of bank stock prices to good and bad news surprises depends on the operating environment confronting banks (bad luck)
5. The financial health of banks matters for the sensitivity of their stock prices to news (bad preparation).

Implications

Empirical support for the bad preparation hypothesis suggests that the response of bank stock prices to news reveals information about their perceived financial health: this finding could be used to build new financial stability indicators

There is plenty that banks can do to reduce the sensitivity of their stock prices to bad news (e.g. improve cost efficiency, ensure sufficient capital, tackle NPLs, reduce reliance on market-based funding)

Future research could test the robustness of these findings to the COVID-19 shock and test whether asymmetric responses of bank stock prices to news are unique (e.g. in comparison with non-financial firms)