

Window dressing of Regulatory Metrics: Evidence from Repo Markets*



By Claudio Bassi (European Central Bank), Markus Behn (European Central Bank), Michael Grill (European Central Bank), and Martin Waibel (Stockholm School of Economics)

Keywords: banking regulation, window dressing, repo markets, leverage ratio, G-SIBs

Banks' ability to temporarily contract their balance sheets around reporting dates to report more favourable regulatory metrics – a regulatory arbitrage practice commonly referred to as window dressing – poses a risk to financial stability. In this paper, we investigate both the magnitude and the drivers of bank window dressing behaviour in euro-denominated repo markets. Using a confidential transaction-level data set, our analysis illustrates that banks engineer an economically sizeable contraction in their repo exposures around regulatory reporting dates. We establish a causal link between these reductions and banks' incentives to window dress and document the role of the leverage ratio and the G-SIB framework as the most relevant drivers of window dressing behaviour. Our findings suggest that regulatory action is warranted to limit banks' ability to window dress.

*This policy brief should not be reported as representing the views of the European Central Bank (ECB). The views expressed are those of the authors and do not necessarily reflect those of the ECB.

Introduction

Window dressing is a growing concern for regulators and supervisors around the world. It refers to the practice by which banks contract their balance sheets towards the end of a period with the aim of reporting and disclosing more favourable regulatory metrics (Bank for International Settlements (2018a), Basel Committee on Banking Supervision (2018b)). Such behaviour can have adverse effects on financial stability for two main reasons. First, financial market functioning may be adversely affected if banks reduce the provision of certain services towards the end of a reporting period (Du et al. (2018), Brand et al. (2019)), where heightened volatility can also imperil the proper functioning of monetary policy (Duffie and Krishnamurthy (2016), Banegas and Tase (2019)). Second, window dressing may imply that reported and disclosed regulatory metrics overstate the resilience of individual institutions and the banking system as a whole and may also distort the estimation of banks' overall systemic importance under the G-SIB framework (Behn et al. (2019), Garcia et al. (2021)), resulting in a possible underestimation of risk and a misallocation of capital requirements in the banking system.

In this article, we take a deeper look at potential window dressing in the market for euro-denominated repurchase agreements – henceforth, "repos" – using a new transaction-level database available at the European Central Bank to document the magnitude and identify the possible drivers of euro area banks' window dressing behaviour. The short-term nature of repo contracts makes them particularly easy to be used for window dressing purposes as banks can quickly adjust their repo exposure around reporting dates. The sudden reduction in repo market liquidity around regulatory reporting dates and the associated drop in repo rates have been well-documented and have raised concerns regarding the implications of window dressing for the functioning of repo markets (see for example, Committee on the Global Financial System (2017)). Our article further informs this ongoing debate by making use of a unique, purpose-built data set with daily frequency that allows to quantify banks' window dressing behaviour and repo market volatility around quarter- and year-end dates. Moreover, the transaction-level nature of the data set enables us to establish a causal link between observed drops in repo quantities and prices as well as banks' desire to report more favourable regulatory metrics. Finally, we further leverage on the granularity of the data to analyse the main drivers of window dressing behaviour, relating variation in period-end repo volume reductions to differences across banks with respect to the level of their leverage ratio, their G-SIB status, or other regulatory variables that could affect the incentives to window dress.

The Role of Regulatory Metrics

The Basel III leverage ratio and the G-SIB framework are the main regulatory factors that may have an impact on window dressing. The former is a non-risk weighted regulatory metric requiring banks to use equity financing in proportion to their overall leverage ratio exposure. From a conceptual point of view, repo transactions directly impact the leverage ratio, as the cash received (or the transaction for which the cash is subsequently used) adds to the leverage ratio exposure measure, which in turn leads to a decline in the bank's leverage ratio.¹ More specifically, when a bank enters a repo transaction, the underlying collateral is left in the bank's securities portfolio, and the cash received increases a bank's assets by a magnitude of the securities pledged as collateral minus a haircut. In contrast, reverse repos do not lengthen banks' balance sheets as cash holdings are exchanged for repo assets. The short-term nature together with the fixed tenor structure provide incentives for banks to engineer a contraction in their repo exposure to report more favorable regulatory metrics.

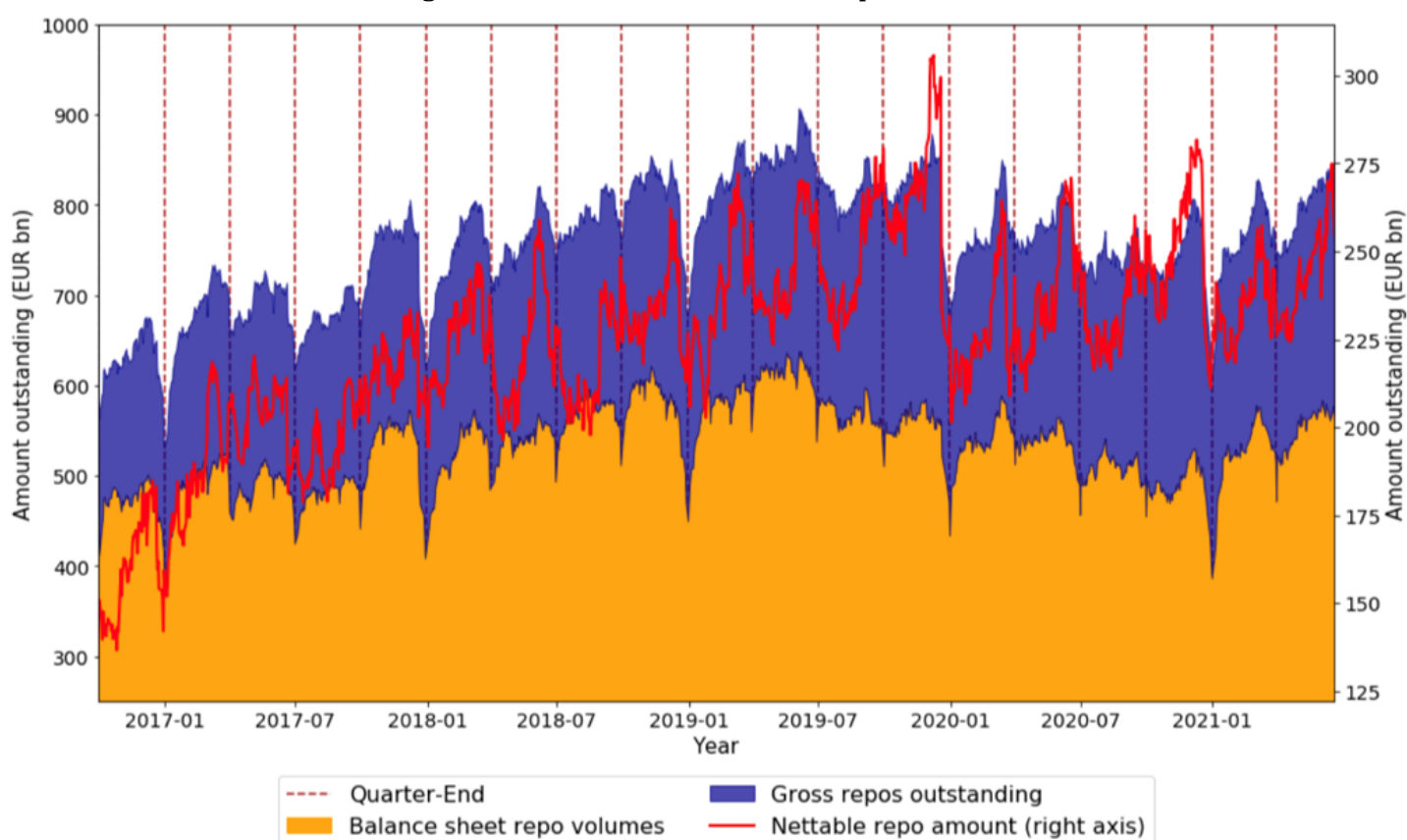
¹ This contrasts with risk-weighted capital ratios. Cash has a risk weight of 0% and therefore does not enter the denominator of risk-weighted capital ratios.

In addition, the G-SIB framework poses another potential source of window dressing incentives. The calculation of the G-SIB score is based on a bucketing-approach and computed based on year-end balance sheet values. Behn et al. (2019) show that by reducing repo volumes at the year-end banks can improve their G-SIB scores. Consequently, the G-SIB framework provides additional incentives for banks to contract their balance sheet repo volumes prior to year-ends.

The Magnitude of Window-Dressing

A novel and distinguishing feature of our study is the analysis of the repo market from the perspective of a bank's daily balance sheet repo book that is relevant for the computation of regulatory metrics. This is possible due to the granularity of the data set that allows to net repo and reserve repo transactions with the same counterparty. Using this data set, we document economically sizeable and long-lasting reductions in balance sheet repo volumes around quarter- and year-ends for our sample of 36 large euro area banks. Specifically, at the aggregate level, we find that banks reduce their balance sheet repo volumes by around 12.5 percent prior to quarter-ends and by up to 25 percent before year-ends. These magnitudes are substantial also in absolute terms, resulting in a reduction in market volumes of EUR 66 billion at the quarter-end and EUR 132 billion at the year-end. This pattern occurs consistently at each period-end in our sample (see Figure 1).

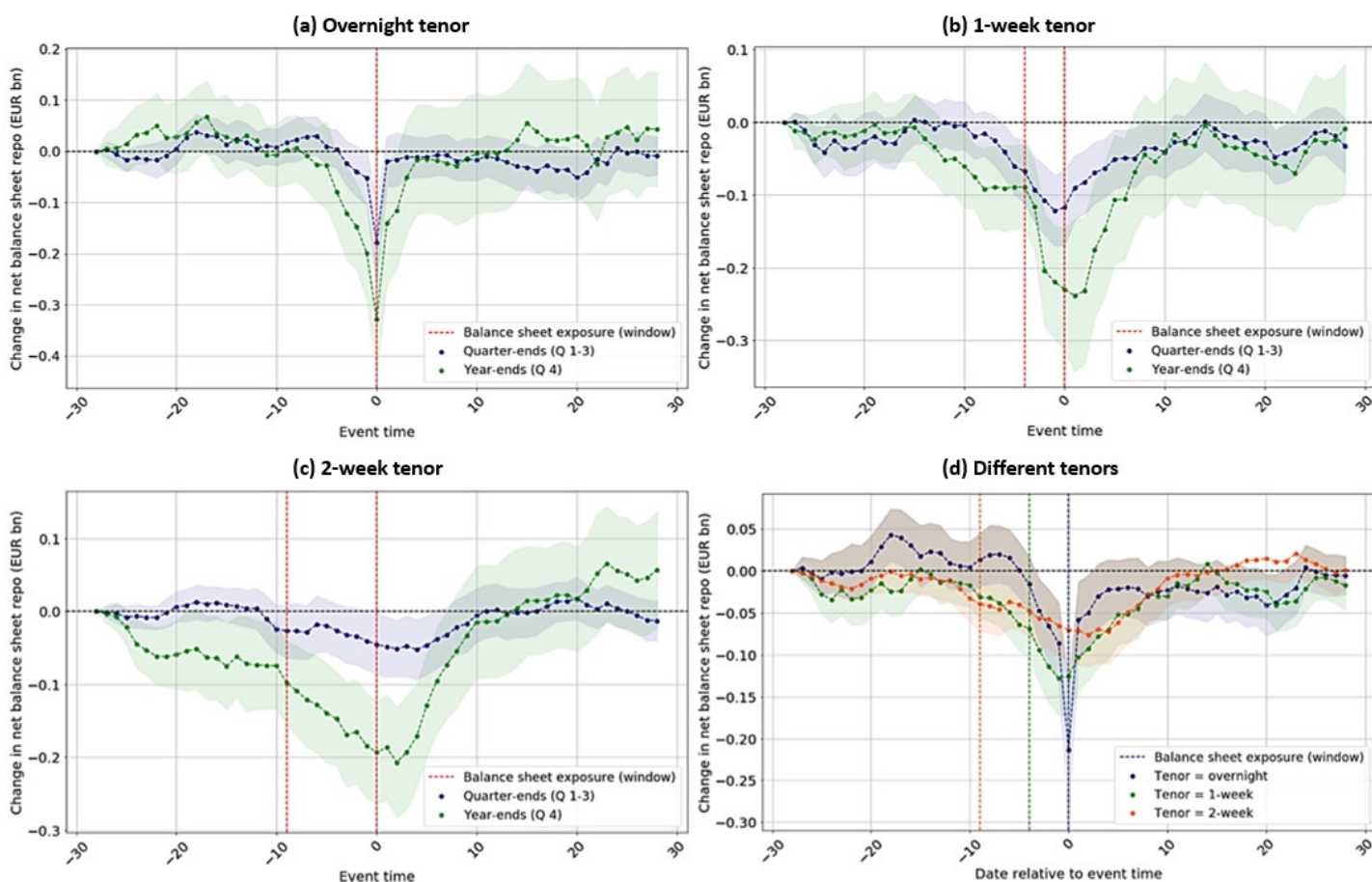
Figure 1: Evolution of balance sheet repos over time



Notes: This figure displays the evolution of gross repos outstanding and balance sheet volumes (left scale) as well as the evolution of nettable repo amounts (right scale) over time. All volumes are expressed in EUR billion and at daily frequency. The dashed red lines indicate the last trading day in each quarter, i.e. the regulatory reporting date. The sample period is from 1 September 2016 to 30 June 2021.

In a next step, we leverage on the granularity of our data set to establish a causal relationship between the observed period-end contractions and banks' window dressing incentives. Specifically, we exploit information on the tenor structure to infer whether or not a given repo contract is balance sheet intensive from the bank's perspective at a specific reporting date.² We then show that banks contract repo volumes according to the underlying tenor structure, starting the contraction of repos with longer tenors well in advance while contracting overnight exposures only shortly before the reporting date.³ We interpret these patterns as evidence for a causal link between observed contractions in repo volumes and banks' window dressing incentives. What is more, Panel b) of Figure 2 illustrates that repo rates drop in conjunction with repo volumes. In equilibrium, this downward rate shift can be reconciled with a contraction in repo demand by which banks are unwilling to enter repo contracts close to period-ends to reduce their balance sheet size, rather than a repo supply-side effect by which liquidity providers are unwilling to enter reverse repo contracts around these dates.

Figure 2: Significant quarter-end contraction in repo volumes according to underlying tenor structure

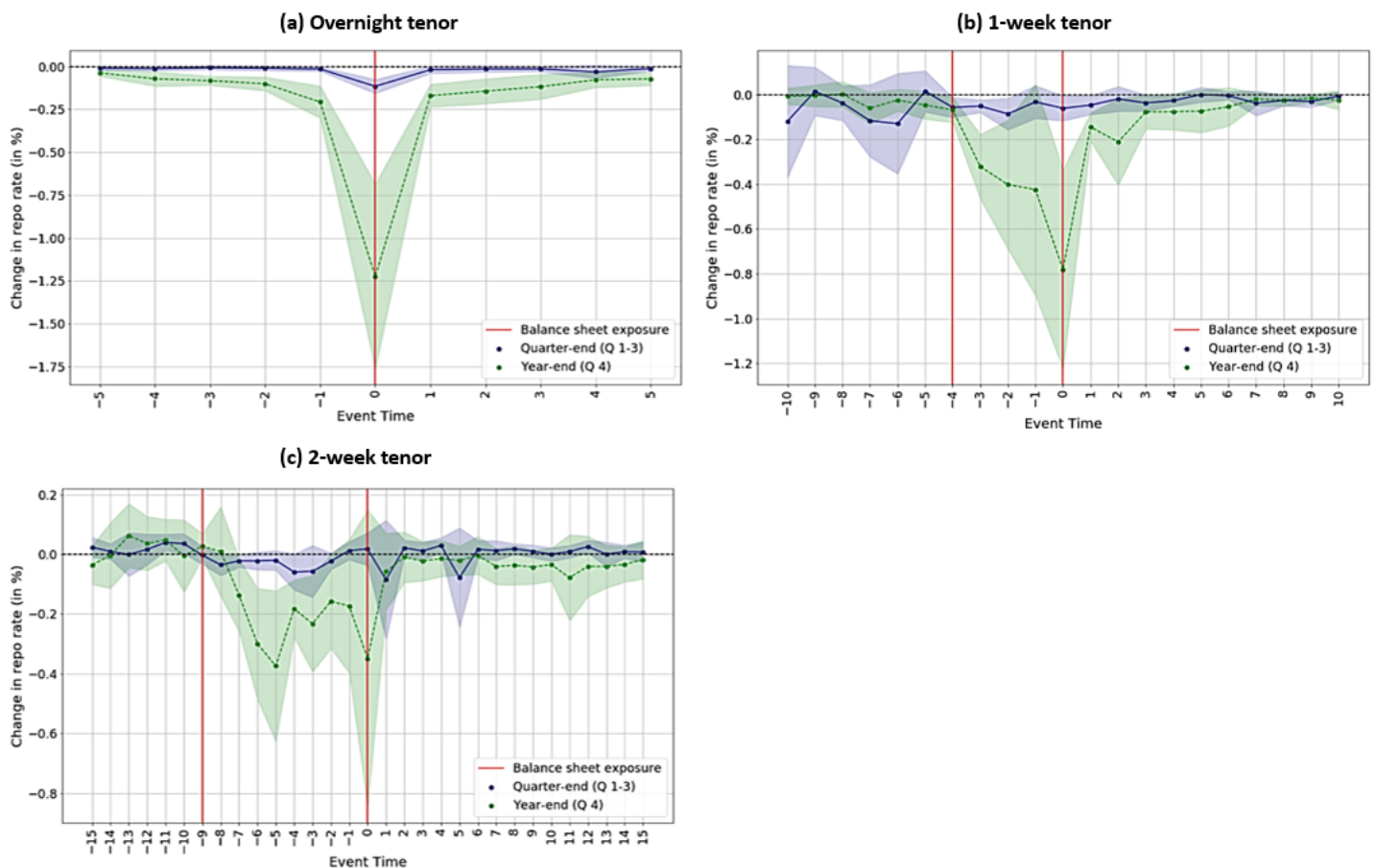


Notes: The top left figure displays event study regressions for repo contracts with overnight tenors. The top right figure displays event study regressions for repo contracts with one-week tenors. The bottom left figure displays event regressions for repo contracts with two-week tenors. The bottom right figure displays event study regressions for repo contracts for multiple tenor specifications. Blue lines indicate coefficient estimates around quarter-ends (Q1-Q3) while the green lines indicate coefficient estimates around year-ends (Q4). The shaded areas indicate 95% confidence intervals. The dashed vertical lines indicate the period during which the respective repo contract ends up on a bank's balance sheet on the reporting date. All coefficients are expressed relative to the base period at $d = T - 28$. The sample period is from 1 September 2016 to 30 June 2021.

² For example, a one-week repo contract that is entered six trading days before the reporting date will have matured by the time of the reporting date. This contract is thus not balance sheet intensive from the perspective of the bank.

³ Specifically, two-week repo contracts start to contract ten to eleven trading days prior to the respective period-end, one-week repo contracts start to contract five to six trading days prior to the period-end, and overnight repo volumes contract only during the last two trading days.

Figure 3: Significant quarter-end reduction in repo rates according to underlying tenor structure



Notes: The dependent variable is the volume-weighted repo rate, separately for repo tenors. The top left figure displays event study regressions for repo contracts with overnight tenors. The top right figure displays event study regressions for repo contracts with one-week tenors. The bottom left figure displays event study regressions for repo contracts with two-week tenors. Blue lines indicate coefficient estimates around quarter-ends (Q1-Q3) while the green lines indicate coefficient estimates around year-ends (Q4). The shaded areas indicate 95% confidence intervals. The dashed vertical lines indicate the period during which the respective repo contract ends up on the bank's balance sheet on the reporting date. All coefficients are expressed relative to the base period at $d = T - 28$. The sample period is from 1 September 2016 to 30 June 2021. For better readability, only the relevant subsection of event days are displayed.

Drivers of Window Dressing

Having established a causal link between bank regulation and the observed period-end contractions in repo volumes, we further examine the underlying drivers of bank window dressing by making use of bank-level heterogeneity in regulatory metrics. This allows us to assess whether and to what extent individual metrics are driving banks' window dressing behaviour. Specifically, for the leverage ratio, we hypothesize that the incentives to window dress are stronger for banks that are closer to the regulatory minimum since these banks may feel pressure from supervisors or investors to improve their regulatory ratio. Similarly, we assume that banks that are designated as G-SIBs have stronger incentives to contract repo volumes at year-ends, since repo volumes are a key determinant of the G-SIB score. Exploiting these types of heterogeneity, we estimate difference-in-differences regression models to assess whether the observed reduction in repo market activity at the quarter- and/or year-end depends on a bank's incentive to window dress.

Our results indicate that banks with lower leverage ratios and banks that are designated as G-SIBs reduce balance sheet repos significantly more at quarter- and year-ends than banks with higher leverage ratios and banks that are not G-SIBs. Specifically, the average bank in our sample reduces balance sheet repo volumes by EUR 1.8 billion at a quarter-end and by an additional EUR 2.5 billion at a year-end. These effects are driven by banks with leverage ratios in the bottom half of the distribution, which reduce their balance sheet repo volumes by EUR 1.7 billion more at the end of a quarter and by an additional EUR 2.3 billion more at the end of a year when compared with banks with leverage ratios in the upper half of the distribution. We further show that these effects are particularly pronounced for G-SIBs, which exhibit a stronger reduction of EUR 2.7 billion at the quarter-end and an additional EUR 4.9 billion at the year-end, when compared with non-G-SIBs. The stronger effect for G-SIBs at the year-end is consistent with the window dressing incentives provided by the G-SIB framework.

Lastly, we do not document any differential effects for banks that differ on other regulatory metrics, such as the risk-weighted CET1 ratio or the LCR. This further corroborates our notion that the detected period-end contractions are mostly driven by banks' concerns about the costs associated to balance sheet space stemming from non-risk-weighted capital requirements such as the leverage ratio and the G-SIB framework.

Conclusion and Policy Implications

This article contributes to the literature on the impact of post-crisis regulation on banks' behaviour and repo market functioning and provides empirical evidence of active window dressing behaviour by banks in euro area repo markets. We observe sharp quarter- and year-end declines in repo volumes that are driven by both a reduction in overall volumes. Our findings suggest that these contractions are driven by regulatory incentives to window dress, stemming from the leverage ratio and the G-SIB framework in particular.

Overall, our findings highlight the need to thoroughly implement the recent recommendations aimed at reducing window dressing incentives by using quarterly averages for the reporting and disclosure of the leverage ratio (Basel Committee on Banking Supervision (2019)). They also indicate a need for further analysis of the extent to which window dressing incentives in the G-SIB framework may warrant further policy action, e.g. the usage of monthly or daily averages rather than end-of-quarter values for certain G-SIB indicators. ■

References

- Banegas, A. and M. Tase (2019). Reserve balances, the federal funds market and arbitrage in the new regulatory framework. *Journal of Banking & Finance* 118, 105893.
- Bank for International Settlements (2018a). Annual Economic Report. Technical report, *Bank for International Settlements*.
- Basel Committee on Banking Supervision (2019). Revisions to leverage ratio disclosure requirements. *Bank for International Settlements*.
- Basel Committee on Banking Supervision (2018b). Statement on leverage ratio window-dressing behaviour. *Bank for International Settlements*.
- Behn, M., G. Mangiante, L. Parisi, and M. Wedow (2022). Behind the scenes of the beauty contest: window dressing and the G-SIB framework. *International Journal of Central Banking*, Vol. 18(5): 302-342.
- Brand, C., L. Ferrante, and A. Hubert (2019). From cash-to securities-driven euro area repo markets: the role of financial stress and safe asset scarcity. *ECB Working Paper No. 2232*.
- Committee on the Global Financial System (2017). Repo market functioning. Technical report, *Bank for International Settlements*.
- Du, W., A. Tepper, and A. Verdelhan (2018). Deviations from covered interest rate parity. *Journal of Finance* 73 (3), 915–957.
- Duffie, D. and A. Krishnamurthy (2016). Passthrough efficiency in the Fed's new monetary policy setting. In *Designing Resilient Monetary Policy Frameworks for the Future*. *Federal Reserve Bank of Kansas City, Jackson Hole Symposium*, pp. 1815–1847.
- Garcia, L., U. Lewrick, and T. Sečnik (2021). Window dressing systemic importance: evidence from EU banks and the G-SIB framework. *European Banking Authority Research Paper No. 12*.

About the authors

Claudio Bassi is research analyst in the Financial Regulation and Policy Division at the European Central Bank. His research focuses on repo markets and their interactions with the regulatory framework. Prior, he has worked as a policy expert working for the Italian Ministry of Finance, tasked with overseeing financial regulation topics in preparation of the Italian G20 Presidency, and at the SSM, supervising the European entities of Goldman Sachs and Morgan Stanley, as well as the Authorization division. He holds a Bachelor of Arts in Business Administration from IE University in Madrid and a Master of Arts in International Relations from the Paul H. Nitze School of Advanced International Studies at Johns Hopkins University in Washington, DC.

Markus Behn is currently Senior Team Lead in the Macroeprudential Policy Division at the European Central Bank. In his role, he is contributing to the preparation of ECB policy stances and assessments on a broad range of macroprudential matters, with focus on the banking sector. His research covers topics in the area of financial intermediation, banking, and financial regulation and is published in a range of leading academic journals. His current role builds on more than ten years of experience with policy and analytical work on financial stability and regulatory topics. He has represented the ECB in European and international workstreams at the Basel Committee on Banking Supervision, the Financial Stability Board and the European Systemic Risk Board, and holds a Ph.D. and a Master in Economics from the University of Bonn.

Michael Grill is currently Team Lead in the Financial Regulation and Policy Division at the European Central Bank. In this role he is contributing to the development of the macroprudential policy framework for non-banks and the policy toolkit in response to climate-related risk. His publications cover topics related to the regulation of financial intermediaries and markets, sovereign risk, macroprudential policy and climate change. His current role builds on over 10 years of experience contributing to policy development and representing the ECB in European and international workstreams at the Basel Committee on Banking Supervision, the Financial Stability Board and the European Systemic Risk Board. He holds a Ph.D. in Economics from Mannheim University and a Diploma in Mathematical Finance from Technical University of Munich.

Martin Waibel is currently a Ph.D. student in Finance at the Stockholm School of Economics. His research mainly focuses on how regulation impacts financial intermediation with an emphasis on the role of nonbank financial intermediaries and implications for financial stability. During his studies he has collaborated in several roles with the European Central Bank and the Federal Reserve Board of Governors. He holds a M.Sc. degree in Economics from the University of Bonn and a B.Sc. degree from the University of Mannheim.

SUERF Publications

Find more **SUERF Policy Briefs** and **Policy Notes** at www.suerf.org/policynotes



SUERF is a network association of central bankers and regulators, academics, and practitioners in the financial sector. The focus of the association is on the analysis, discussion and understanding of financial markets and institutions, the monetary economy, the conduct of regulation, supervision and monetary policy.

SUERF's events and publications provide a unique European network for the analysis and discussion of these and related issues.

SUERF Policy Briefs (SPBs) serve to promote SUERF Members' economic views and research findings as well as economic policy-oriented analyses. They address topical issues and propose solutions to current economic and financial challenges. SPBs serve to increase the international visibility of SUERF Members' analyses and research.

The views expressed are those of the author(s) and not necessarily those of the institution(s) the author(s) is/are affiliated with.

All rights reserved.

Editorial Board

Ernest Gnan
Frank Lierman
David T. Llewellyn
Donato Masciandaro
Natacha Valla

SUERF Secretariat
c/o OeNB
Otto-Wagner-Platz 3
A-1090 Vienna, Austria
Phone: +43-1-40420-7206
www.suerf.org • suerf@oenb.at