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## Abstract

Share buybacks have become a popular way for companies to return capital to shareholders. However, there is an ongoing debate regarding the impact of share buybacks on the performance and shareholder value. This paper starts by examining the literature on share buybacks and aims at testing the signalling hypothesis (ie share buybacks are carried out to signal undervaluation of the stock) on share repurchases performed by banks. More specifically, the analysis conducted measured the impact of share buybacks on banks' performance as measured by the return on equity (ROE). The results show that there is low significant positive linear relationship between banks' share buybacks and their ROE.

## Keywords

Share buybacks, banks' performance, return on equity, shareholders' value, pay-out policy, banking.

**JEL code:** G21-G32

## 1. Introduction

The pay-out policy has long been one major research topic in corporate finance starting from the renowned pay-out irrelevance proposition formulated by Modigliani & Miller (1958). According to this proposition the pay-out choices available to firms, i.e. dividends versus share buybacks (also share repurchases), are equivalent in an idealised world without taxes, frictions, and information asymmetries. However, in a world with taxes, frictions, and information asymmetries there could be reasons for firms to prefer share buybacks to dividends to distribute the profits to their shareholders. More specifically, in addition to the potential tax advantages that could lead a firm to prefer one pay-out method over another, the economic literature has shown that share buybacks may be the option favoured by firms as they signal to the market stock undervaluation and therefore may also be a means to deter takeover attempts on the firm.

Share buybacks is essentially a mechanism by which companies repurchase their own shares from the market, thereby reducing the number of outstanding shares. Share buybacks have become increasingly popular among firms as a way to return capital to shareholders. The decision to buy back shares is typically based on a variety of factors, including the company's financial health, cash position, and growth prospects. However, there is ongoing debate regarding the impact of share buybacks on a company's financial health, shareholder value, and long-term growth prospects.

The purpose of this paper is to examine the literature on share buybacks to assess their impact on a firm's financial health, share price, and long-term growth prospects. Specifically, we will review the existing research to determine whether share buybacks are an effective way to enhance shareholder value.

The BIS Quarterly Review discusses the impact of buybacks on corporate resilience and the need for public support. Buybacks are a means to distribute cash to shareholders, but they are of concern for two reasons: first, they could artificially increase stock prices in order to boost performance pay, and second, they could be a tool to raise leverage to excessive levels. Overall corporate pay-outs rose substantially in recent years, with US firms distributing \$4 trillion in dividends and \$6 trillion in buybacks, or \$4 trillion net of equity issuance. Stock buybacks can be a double-edged sword from investors' perspective, as they can support a firm's market price by signalling undervaluation, achieving tax efficiency gains relative to dividends or helping avoid wasteful expenditures by managers, but they could be detrimental to long-term firm value if executives use them simply to increase their performance pay.

Corporate stock buybacks have tripled in the last decade, often to attain desired leverage, or debt as a share of assets. This can be excessive if companies do not account for all financial distress costs, including those potentially shifted to the public purse as a result of bailouts. Buybacks are a powerful tool for leverage management, as they complement and reinforce the effect of debt issuance on firms' capital structure. Equity decreases and leverage rises, more rapidly so when funds are obtained by issuing debt. For example, a firm with \$100 in assets, \$30 in debt and \$70 in equity starts with leverage equal to 0.3.

More recently, share buybacks have also come under attack because of the public perception that the excess funds used to finance these operations have come from tax cuts and other sources (such as government bailouts) that were originally intended to foster investments by the firms or sustain wage increases for their workers. Thus, supporters of this claim have argued for amending tax laws across the different jurisdictions to discourage buybacks on the theory that the benefits of these operations favour mostly top executives and wealthy shareholders. In some jurisdictions, like in the US with the bill signed by Baldwin, Warren and Schatz, the regulators went as far as banning the open market stock buybacks claiming that "it's just wrong for big corporations to pocket massive, permanent tax breaks and reward the wealth of top executives with more stock buybacks, while closing facilities and laying off workers".<sup>1</sup> Stock buybacks have also found widespread support as they give companies the flexibility to return cash to shareholders who can then reinvest this cash in other more profitable projects. In this regard, Warren Buffet stated: "as the subject of repurchases has come to a boil, some people have come close to calling them un-American characterizing them as corporate

<sup>1</sup>See press release at [www.baldwin.senate.gov/press-releases/reward-work-act-2019](http://www.baldwin.senate.gov/press-releases/reward-work-act-2019).

misdeeds that divert funds needed for productive endeavours. That simply isn't the case. . . I'm not aware of any enticing project that in recent years has died for lack of capital (Call us if you have a candidate)"<sup>2</sup>. In August of 2022, President Biden signed the Inflation Reduction Act (IRA) into law. It is a climate and tax bill that advances administration economic priorities.

The Act contains provisions intended to discourage the largest firms from exploiting tax loopholes that allow them to pay minimal or no federal income tax. In addition, it provides new and expanded tax incentives to encourage businesses and people to increase their usage of renewable energy.

While additional guidelines and regulations are anticipated in the coming months and years, here is an overview of the Inflation Reduction Act's principal business tax provisions. Unless explicitly specified, all modifications become effective after December 31, 2022. The IRA imposes a 1% tax on the fair market value of stock repurchased during the tax year by a publicly traded U.S. firm. The amount liable to this 1% tax is typically the amount paid by the issuing corporation to shareholders during the year in exchange for their issuing corporation stock, less the value of any stock issuances during the taxable year. The excise tax applies to IRC 317(b) redemptions, economically similar transactions, and stock acquired from a third party by a specified affiliate of a corporation. It also applies to some acquisitions and repurchases of publicly traded foreign corporate stock.

In the case of banks, this subject is even more significant and is gaining the attention of the international authorities. A number of financial sector rules that helped maintain financial stability during the pandemic have expired or been revised in the past couple of years. In September 2021, the limitations on dividend pay-outs and share buybacks that had been imposed on euro area banks were relaxed. Almost all lending moratoriums and government guarantee programs that aided in bolstering banks' asset quality have now officially ended (ECB, 2021). Indeed, following prior announcements of temporary capital and operational relief measures, ECB Financial Supervision recommended on March 27 that banks refrain from distributing dividends and repurchasing shares until October 1, 2020. All national authorities in the eurozone had made identical requests to the banks directly under their jurisdictions.

During the pandemic, ECB advised banks not to pay dividends or transfer capital to shareholders through share buybacks. That was an exceptional scenario as there was no visibility at all. We were unable to distinguish between the potential impact on a bank with a good capital position and a bank with a considerably more constrained capital position since the amount of the impact was difficult to predict. Currently, there is still a great level of uncertainty, but we can do much more granular work on exposures to vulnerable sectors and banks with specific exposures to Russia or Ukraine; banks with large exposures to customers who are highly sensitive to interest rates; and banks highly exposed to leverage finance or counterparty credit risk (Enria, 2022).

As for the US context, the Federal Reserve Board declared in March 2021 that the temporary and extra limits on bank holding company dividends and share repurchases presently in effect would have been lifted for the majority of enterprises in June 2021, following the conclusion of the last round of stress testing. As of that date, firms having capital levels exceeding the stress test requirements were no longer subject to the additional restrictions. The limits will continue to apply to firms with capital levels below those necessary by the stress test. The Securities and Exchange Commission proposed revisions to the regulations addressing disclosure of an issuer's repurchases of its equity shares to require an issuer to submit a new Form SR (including information related to the class of securities purchased, the total amount purchased, the average price paid, and the aggregate total amount purchased on the open market) by the end of the first business day after the date on which it repurchases shares.

The economic literature pointed out that, in addition to the opportunistic use of buybacks by top executives to boost performance pay, these operations could suitably be used by managers as a tool to increase leverage to excessive levels (Aramonte, 2020). Therefore, considering the potential for increasing leverage, risk managers and supervisors alike should pay particular attention to the potential negative effects that this tool may have on the capital position of banks. Given the importance of share buybacks the economic literature has been focusing on this topic studying different aspects.

However, the link between stock buybacks by banks and their future performance is not entirely clear (the results shown by the different studies available is rather inconclusive or conflicting). Bridging this gap, this paper aims at studying the link between stock buybacks by banks and their future economic performance to test the signalling hypothesis that argues that these operations are undertaken by the managers of the company (in our case bank) to signal to the market the undervaluation of the stock given its future potential. The analysis will be carried out by studying a sample of 1336 worldwide banks in the period between 2015 to 2021. The paper is organised as follows: section two will focus on the literature review on the topic; section three will present the relevant details on the dataset used for the analysis; section four will introduce the model used to test the link between stock buybacks by banks and their future performance while section five will outline the conclusions of the analysis.

## 2. Literature review

According to the existing literature on the topic up until 1980 companies worldwide mainly used dividends as a means of payment of surplus to the shareholders despite the relative tax advantage of share buybacks (Barclay and Smith, 1988). The number of share buybacks started growing in US after 1980. As a matter of fact, the spending of companies in US for share buybacks increased from 4.8% in 1980 to 41.8% in 2000 and in the period from 1990 to 2000, for the first time in history, companies spent more on share buybacks than in dividends (Grullon and Michaely, 2000). After the US experience, the share buybacks acquired popularity also in other developed countries such as UK, Canada, Australia, Japan, and France.

Share buybacks have been a popular way for companies to return capital to shareholders. Several studies have shown that share buybacks can lead to an increase in shareholder value. For example, a study by Ikenberry, Lakonishok, and Vermaelen (1995) found that firms that announced share buybacks experienced significant positive abnormal returns. Similarly, a study by Brav, Graham, Harvey, and Michaely (2005) found that firms that repurchased shares outperformed their peers in the three years following the buyback.

<sup>2</sup> See 2016 Berkshire Hathaway shareholders letter at [www.berkshirehathaway.com/letters/2016ltr.pdf](http://www.berkshirehathaway.com/letters/2016ltr.pdf)

However, not all studies have found a positive relationship between share buybacks and shareholder value. A study by Fenn and Liang (2001) found that share repurchases did not significantly increase shareholder value in the long term. Similarly, a study by Yook (2008) found that while share buybacks led to an increase in share prices in the short term, they did not lead to sustained long-term growth.

There are several reasons why share buybacks may not lead to sustainable long-term growth. First, share buybacks are typically funded by cash reserves, which could be used for investment in research and development or capital expenditures. Second, share buybacks can reduce the number of outstanding shares, which can make the company appear more profitable on a per-share basis but does not necessarily increase overall profitability. Finally, share buybacks can lead to a decline in the company's financial flexibility, as it reduces the company's cash reserves.

Based on the existing literature, it appears that share buybacks can lead to an increase in shareholder value in the short term. However, there is no consensus on whether share buybacks lead to sustained long-term growth. While some studies have found a positive relationship between share buybacks and long-term growth, others have found no relationship or even a negative relationship.

One potential explanation for the mixed results is that the impact of share buybacks may depend on the company's financial health, growth prospects, and investment opportunities. For example, a financially healthy company with limited investment opportunities may be better served by returning capital to shareholders through share buybacks. On the other hand, a company with significant growth opportunities may be better served by investing in research and development or capital expenditures.

To sum up, different and diverse are the hypotheses identified by the economic literature that could justify share repurchases by companies. The list below provides an overview of these hypotheses:

1) Signalling hypothesis: according to the signalling hypothesis supported by Ross (1977), Bhattacharya (1979) and Spence (1973) the management of a company mainly uses the dividend policy as a signalling tool for the market. These studies, underscore the fact that share buybacks give two signals to the market such as undervaluation of the shares or enhanced potential growth prospects of the company. When a company announces that it will buy back shares at a huge premium it essentially signals to the market that the stock is undervalued. In this respect, Vermelen (1981) found that signalling is the most plausible explanation of the abnormal returns in the stock market after the share buyback. Bartov (1991) found that open market buybacks convey information on both earnings prospects and risk changes. Other studies such as the one of Stephens and Weisbach (1998) found a negative relationship between share buybacks and prior price performance of the stock. The studies of Comment & Jarrell (1991), Louis and White (2007) and Haw et al. (2013) examined the signalling effect of different methods of three types of share buybacks in the US such as Dutch auction self-tender offer, fixed price self-tender, and open market buybacks and concluded that fixed price self-tender method conveys a stronger signal of undervaluation than others.

2) Substitution hypothesis under the substitution hypothesis it is assumed that the share buyback programmes are implemented by companies as a pay-out method for shareholders over dividends. This hypothesis lies its foundations in the different fiscal treatment of the capital gains as compared to the dividends. As Grullon and Michaely (2000) point out capital gain tax is much lower in most jurisdictions than the tax on dividends hence shares repurchase is more tax efficient and valuable to shareholders. Another important characteristic of the share buyback programmes is their flexibility as unlike dividends they do not “promise” cash flows at regular intervals (Dittmar, 2000).

3) Optimum leverage hypothesis: Bagwell and Shoven (1988), Dittmar (2000), Mitchell and Dharmawan (2007) and Hovakimian et al. (2001), supporters of the optimum leverage hypothesis, argue that companies having a debt-to-equity ratio that is lower than the target ratio are more likely to undertake share buybacks. These studies therefore highlighted the importance played by the comparison between the actual and the target leverage ratio when the management of the company decides to implement a share buyback programme. The highest the difference between the actual and optimal leverage ratio, the highest the probability that the company will undertake a share buyback programme. Thus, by executing a share buyback programme the management increases the leverage in the capital structure of the firm and by benefitting of the tax shield provided by the additional debt they also increase the total value of the firm (Modigliani, Miller).

4) Takeover deterrence hypothesis: according to the takeover deterrence hypothesis companies would implement a share buyback programme when feeling under threat from a competitor. Bagwell (1991) demonstrated that when shareholders believe the value of their shares is more than repurchased price do not tender their shares for sale. In another research piece, Bagwell (1992) demonstrated that the cost of the acquisition for a potential acquirer will be higher in cases in which the company buys back shares as compared to cases in which it distributes dividends. Sinha (1991) went further documenting that this effect is even more pronounced when the repurchase is financed through debt. In such cases the value of the firm is increased making it also a less attractive target.

5) Stock option hypothesis: the stock option hypothesis that has been formulated by Kahle (2002) and Bens et al. (2003) found a positive correlation with the number of share buybacks done by the companies and the stock options outstanding given to employees. In particular, the authors claim that a large number of stock options outstanding has a dilutive effect on the EPS. In order to neutralise this effect, companies’ buyback shares.

6) Excess capital or cash flow hypothesis: the excess capital or cash flow hypothesis supported by Jensen (1986) and Vafeas and Joy (1995) found that the decision to buy back shares to distribute surplus cash to shareholders seeks to reduce the agency cost. According to this strand of studies, in fact, if firms hoard cash or capital in excess there is a higher probability that their management will undertake negative net value projects. Thus, a higher dividend pay-out or share buybacks will reduce the free cash flow available for the managers. Boudry (2013) found a positive relationship between the availability of cash and share buybacks holding investment opportunities constant.

7) Corporate governance hypothesis: the corporate governance hypothesis supported by Lee et al. (2007) claims that managers may use buybacks to exploit favourable price conditions. The underlying rationale underpinning this hypothesis is that managers can fruitfully exploit their insider information to get the advantage of undervalued shares.

8) Liquidity hypothesis: the relationship between liquidity and share buybacks has been studied first by Barclay and Smith (1988) however, it was Brockman et al. (2008) that found a positive relationship between liquidity and share repurchase. According to the evidence provided by this research, the companies that are more liquid (i.e. have more liquidity available) are also those that are more likely to undertake a share repurchase instead of distributing dividends.

None of the hypotheses reported above has been identified unanimously by the literature as the sole determinant of share repurchase by companies. Dittmar (2000) found that out of all the hypotheses mentioned above, stock undervaluation is the prime determinant that leads US companies to repurchase shares followed by excess capital hypotheses. Jagannathan and Stephens (2003) found that the justification for implementing a share repurchase might vary depending on whether the companies are frequent repurchasers or not. The study found that frequent repurchasers are large companies with less variation in operating income that implement share buybacks mainly as an alternative way of distributing excess cash to their shareholders. On the contrary, the primary motivation for infrequent repurchasers (mainly small and less structured companies) to implement buybacks is stock undervaluation. Backer et al. (2003) tested five hypotheses i.e. signalling, agency cost of free cash flow, capital market allocations, tax-motivated substitutions for dividend and capital structure adjustments, and found that undervaluation is the most important motive behind repurchase followed by lack of investment opportunities.

Li and McNally (2007) tested the hypotheses on some Canadian companies and found that firms with greater free cash flow, lower market to book ratio, negative return prior announcement and more insider holdings are more likely to repurchase their stocks. Thus, in Canada, firms are motivated to do share buybacks mainly by the agency hypotheses followed by undervaluation hypotheses.

Benhamouda and Watson (2010) examined the determinants influencing open market repurchase decisions in the UK. The study found that excess capital and substitution hypotheses are the motivating factors for share repurchase. This study doesn't support stock option hypothesis.

Farrugia et al. (2011) studying a sample of Australian companies, examined the relationship between the region where the companies were headquartered and the number share repurchases. They found that share buyback programs are positive and statistically significant in high rich areas compared to poorer areas. They also reported that firms going for frequent repurchase enjoyed of stronger returns across the business cycle compared with firms doing infrequent buybacks.

Andriosopoulos and Hoque (2013) reported that the firm's size, the cash dividend, and concentration of the ownership structure are important factors in explaining the decision to repurchase shares for firms that are headquartered in countries like UK, Germany, and France. The results of this study show that large and widely held firms are more likely to make share buyback announcement and also found a complementary relationship between dividend payment and share repurchase in UK and Germany.

Yarram (2014) studied various factors that influence open market repurchases in Australia. The results of the study show support for the agency, signalling, and leverage hypotheses whereas they do not support the excess cash flow and the substitution hypotheses.

Chung et al. (2013) tested the signalling, free cash flow, management incentives, leverage, substitution and moral hazard hypotheses for determining factors influencing repurchase decision in Taiwan. The study found that out of all the above-mentioned hypotheses only signalling and free cash flow play a significant role in influencing share buyback decisions.

Bonaime et al. (2014) studied the relationship between share buybacks and the companies target capital structure. The authors found that the study found that out of the four combinations of target capital structure and mispricing (Under levered/Undervalued, Under levered/Overvalued, Over-levered/undervalued, Over-levered/overvalued) the firms add more value by doing share buybacks when they are under levered and undervalued both.

Another separate strand of research (Singh k. et al., 1994; Wiggins B., 1994; Miller and McConnell, 1995; Franz et al., 1995; Brockman & Chung, 2001; Ahn et al., 2001; Cook et al., 2004; Ginglinger and Hamon, 2007; Ridder and Råsbrant, 2009; McNally and Smith, 2011; De Cesari et al., 2011) focused specifically on the effects of share buybacks on liquidity. The discussion of the findings of these studies goes beyond the scope of this paper.

## **2.1 Share buybacks for banks**

The literature on share buybacks in the banking industry is focused on some specific and technical aspects. One study found a positive relationship between stock repurchases and the financial performance of US bank holding companies (Federal Reserve Bank of New York, 2003). Another study (Federal Reserve Bank of New York, 2014) found that banks share repurchases programs tend to drop, as compared to the payment of dividends, during financial crisis. However, other studies found conflicting evidence with the results shown above. One study (Raghavan & Morris, 2005) focused on the US banking sector found no evidence of the signalling effect on banks. More specifically, the study shows that share repurchases do not coincide with superior future performances of the banks undertaking these programs. Along the same lines, Howe & Jain (2006), studying a sample of US bank holding companies during the period between 1994 to 1998, found a negative relationship between share repurchases and capital ratios (i.e. share repurchases in banks lead to a decrease of their capital ratios) while finding evidence of a positive relationship between share repurchases and industry-adjusted ROA in the following two years from the announcement.

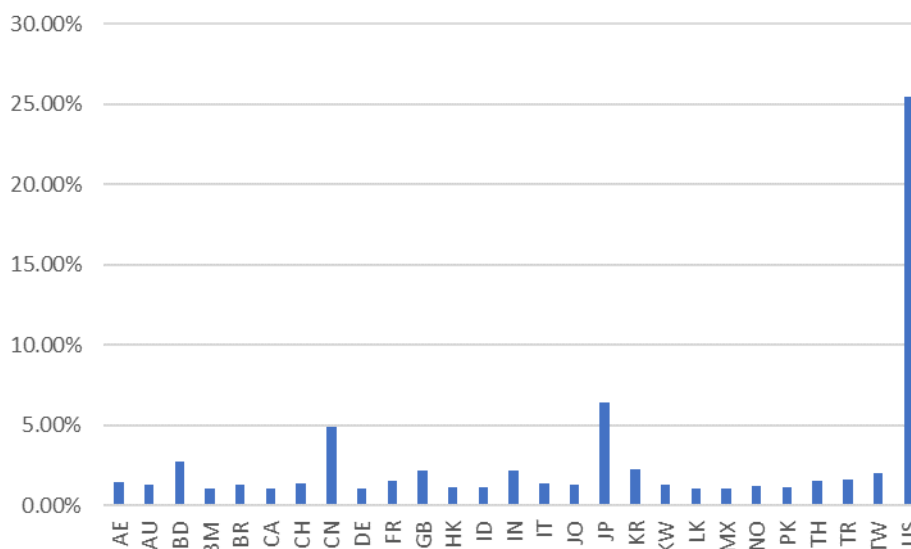
To sum up, the economic literature on the share repurchases by firms is quite extensive. The studies analysed here focused on the factors that drive repurchases decisions by firms. These factors may differ from country to country depending on the institutional framework of share buyback in the specific country. For this reason, in a different country, different hypothesis is influencing share buyback decisions. However, the different studies did not identify a single most relevant factor that always supports the decision of repurchasing the shares. Another relevant finding of the existing literature is that the decision to repurchase share by a company may lead to a wealth distribution effect between non-selling shareholders or long-term shareholders at the expense of the short-term

shareholders. The economic literature on share buybacks is also quite extensive and covers different areas. From the evidence collected in previous studies it is not entirely clear, however, what is the link between the share repurchases programs and the long-term performance of banks. This paper aims at bridging this gap by leveraging on the most recent data of a sample of worldwide banks or banking groups.

### 3. Dataset and descriptive statistics of the sample

The source of the dataset is BankScope and it includes relevant economic and financial metrics of 1,336 worldwide banks in the period from 2015 to 2021 (using annual data). It includes all the available institutions classified as banks by the provider during the selected period. The chart below shows the geographic distribution of the banks in the sample by country of origin.

Chart 1: Breakdown by country of origin of the banks in the sample



Source: internal elaboration on the data

The chart features the countries having a share of banks above one percent in the sample, all the countries not reaching this threshold have been excluded from the chart above. None of the banks included in the sample by default from the provider has been excluded from the analysis. Slightly more than a quarter of banks represented in the sample are headquartered in the US (25.45%) with the second country more represented being Japan and the third one Canada (having a share of banks in the sample respectively of 6.44% and 4.94%). The number of institutions remained stable across the years apart from the last year (2021) when the overall number of banks decreased to 1,335. The composition of the sample is also largely consistent with the BIS's official data on buybacks in terms of the amount repurchased, indicating that the sample is representative. Indeed, in 2019, US companies repurchased their own shares in the amount of \$800 billion, net of equity issuance. Similar patterns were observed on a worldwide scale, with Japan, the United Kingdom, France, Canada, and China posting repurchases totalling a combined \$130 billion in 2019. The nation level increases were most evident in China, where repurchases increased tenfold to \$17 billion, and Japan, where they increased fivefold to \$52 billion. Given the large magnitude and longer history of share repurchases in the United States, the remainder of this section focuses on US data on non-financial corporations' buybacks.

Details on the number of banks as well as descriptive statistics on the main metrics are provided in the table below.

Table 1: descriptive statistics of the sample

	2015			2016			2017			2018			2019			2020			2021		
	Obs.	Mean	MED	Obs.	Mean	MED	Obs.	Mean	MED	Obs.	Mean	MED	Obs.	Mean	MED	Obs.	Mean	MED	Obs.	Mean	MED
Op. Rev (USD mln)	1305	2,550	320	1329	2,511	331	1335	2,783	377	1332	2,807	380	1334	2,936	402	1335	2,996	419	1315	3,247	455
P&L before tax (USD mln)	1305	749	91	1329	743	94	1335	861	112	1332	892	105	1334	895	116	1335	711	90	1315	1,130	144
NI (USD mln)	1305	579	68	1329	554	71	1335	632	80	1332	707	83	1334	713	90	1335	572	68	1315	907	108
TA (USD mln)	1305	74,879	6,534	1329	76,578	6,892	1335	84,955	7,759	1332	86,001	7,814	1334	89,592	8,628	1335	102,364	9,751	1315	110,022	10,600
Equity (USD mln)	1305	5,950	819	1329	6,089	883	1335	6,845	989	1332	6,953	1,018	1334	7,390	1,098	1335	8,002	1,165	1315	8,698	1,241
Own shares (USD mln)	333	156	10	343	196	11	357	222	15	375	248	14	388	270	14	389	298	15	373	362	14
Number of Emploess	1070	11,246	1,794	1080	11,647	1,790	1087	11,682	1,829	1075	11,670	1,963	1090	11,462	2,054	1107	11,445	2,114	1106	11,829	2,127
NPL ratio	1079	5.14	1.93	1110	5.37	1.90	1116	4.94	1.79	1132	4.90	1.85	1148	5.34	1.92	1142	5.50	2.02	1122	5.37	1.95
T1 Ratio (%)	824	14.27	12.89	843	14.52	13.10	875	14.64	13.44	886	14.81	13.43	892	15.28	13.86	861	15.73	14.26	835	15.97	14.37
TC IRatio (%)	978	18.84	15.03	997	18.56	15.12	1020	19.31	15.30	1019	18.64	15.35	1018	19.18	15.69	992	19.93	16.10	964	20.06	16.08
ROE (%)	1305	10.32	9.89	1329	9.08	9.58	1335	10.05	9.55	1332	8.70	9.96	1334	11.27	9.75	1335	7.84	7.83	1315	4.67	10.68
Cost/Income (%)	1293	60.59	59.45	1317	59.13	58.87	1323	58.94	58.82	1323	60.59	59.02	1324	54.43	58.56	1326	65.10	58.23	1306	58.79	56.67
RWA/TA	865	85	69	891	66	69	924	66	70	931	66	70	933	66	70	907	144	64	878	60	63

Source: internal elaboration on the data

As could be seen in the table, the operating revenues of the banks in the sample increased steadily over the period under analysis. Similar trends could be observed for the other profitability metrics shown. It is important to underscore that the average net income plunged in 2020 as a consequence of the COVID-19 pandemic. By the same token, the average NPL ratio increased over 2019 and

2020. The overall capital position of the banks improved steadily over the period observed as underlined by positive upward trends of all the main metrics (Equity in USD, T1 capital ratio and total capital ratio). This is in line with the findings of the BIS showing improved resilience, as measured by an increased amount of capital of a better quality, of the worldwide banking sector.<sup>3</sup> The overall profitability as measured by the ROE mean value in the sample showed a high variability over the period bottoming at 4.67% in 2021. The data however is heavily biased by the presence of outliers in the sample. Thus, the ROE median value seems to be a better value to assess the evolution of the profitability for the banks in the sample over the period between 2015 to 2021. The median ROE for the banks in the sample remained stable at approximately 10% from 2015 to 2020. The median ROE for this year was substantially lower and equal to 7.83%. The decline in profitability in 2020 is in line with the overall negative trend underscoring the effects of the pandemics on the banking sector as well as on the overall economy. The average total assets of the banks in the sample increased over the period under analysis from approximately 74 bn to 110 bn USD.

The own shares variable shows the value of shares owned by the bank and held in its portfolio. Increases of this variable entail the repurchases of stock by the bank.

The values of the main metrics (such as for instance operating revenues and P&L before tax) of the banks in the sample are denominated in USD.

## 4. Analysis

### 4.1 Empirical results

The main objective of this paper is to test the reliability of the signalling hypothesis for share buybacks in the banking sector. As seen in section 2, this hypothesis is one of the main explanations supporting the decision of top executives to buyback shares.

To test this hypothesis, we assume that if the value of the stock is perceived as undervalued by the top executives, who have insider information on the future prospects of the bank, there should be a link between the share buybacks and future profitability of the bank. We therefore assess the relationship between the share buybacks (“Own shares” variable) and the increased profitability as measured by the ROE.

We conduct a panel regression analysis through model 1. The panel is unbalanced since not all the financial firms in each country have been trading continuously from 2015 to 2021.

We run the following model:

$$ROE_{i,t} = \alpha_i + \sum_{i=1}^n \beta_{i,t} X_{i,t} + \beta_{i,t} Own\ shares_{i,t} + \sum_{i=1}^{n-1} Firm_i + \sum_{j=1}^{m-1} Time_j + \varepsilon_{i,t}$$

where ROE is the return on equity, X is a (n x 1) vector of firm-specific variables, which are selected by estimating model returning the highest Akaike information criterion, Own shares is the annualized share buyback. Finally, Firm and Time are firm and time dummies to control for the individual fixed firm and time effects, respectively.

Table 2: Panel regression results.

Dependent variable	ROE					
	Own shares	0.0096*	0.0089*	0.0121	0.0095*	0.0035
RWA/Total assets		-0.1253***	-0.1432***	-0.0587*	-0.0955*	-0.08112*
Market capital		5.8136***	4.5229***	4.7628***	4.2269***	
Cost/Income			-0.2522***	-0.0373***		
Number of employees				-0.0069	-0.0065	-0.0015
Tier 1 Ratio					0.0727**	0.0061*
Dividend payout					0.0079	
Earnings per share						0.0274**
Dividend per share						-0.0087
Book value per share						-0.0137
adj. R <sup>2</sup> (%)	2.76	9.06	21.92	23.87	26.12	29.79

Notes: This table presents the panel regression coefficients from model 1. All the variables are taken at an annual frequency. All equations are estimated with firm and time fixed effects. Intercept results are not reported for the sake of space.

The panel regression estimates are reported in Table 2. Interestingly the table shows that the variable “own shares” has a positive albeit low impact on ROE in three cases. In all the cases the variable is significant considering a 10% level of confidence, suggesting not a strong statistical relationship. Starting from left, the first regression, a simple linear regression having as dependent variable the ROE and as independent variable “own shares”, shows that for each additional unit of “own shares” the ROE (measured in percentage points) increases of 0.0096. The adjusted R-squared shown at the bottom of the table, however, suggests that the explanatory power of the model is rather limited as it is equal to 2.76%. At the other end of the table we see that the “own shares”,

<sup>3</sup> <https://www.bis.org/statistics/consstats.htm>

even if considered with all the other variables of the model, has a positive impact on the ROE. More specifically, keeping all the other variable constant, each unit increase of “own shares” determines an increase of the ROE equal to 0.0033. The adjusted R-squared substantially improved considering also the other control variables in the model and is now equal to 29.79%.

Since a buyback performed in  $t - 1$  could also affect the ROE, we run also model 2:

$$ROE_{i,t} = \alpha_i + \sum_{i=1}^n \beta_{i,t} X_{i,t} + \beta_{i,t} Own\ shares_{i,t-1} + \sum_{i=1}^{n-1} Firm_i + \sum_{j=1}^{m-1} Time_j + \varepsilon_{i,t}$$

The panel regression estimates are reported in Table 3

Table 3: Panel regression results with lagged  $t - 1$  Own shares.

Dependent variable	ROE					
Own shares at $t - 1$	0.0012	0.0011	0.0009	0.0010	0.0011*	0.0010*
RWA/Total assets		-0.1067***	-0.1080***	-0.1422***	-0.1783***	-0.1496***
Market capital		5.0168***	5.2337***	4.3261***	5.8806***	
Cost/Income			-0.1686***	-0.1602***		
Number of employees				-0.0017	-0.0044	-0.0011
Tier 1 Ratio					0.0014***	0.0007***
Dividend payout					0.0036	
Earnings per share						0.0348***
Dividend per share						-0.0071
BookValue per share						-0.0015
<i>adj.R<sup>2</sup>(%)</i>	1.23	3.92	5.83	9.02	12.07	13.45

Notes: This table presents the panel regression coefficients from model 2. All the variables are taken at a annual frequency. All equations are estimated with firm and time fixed effects. Intercept results are not reported for the sake of space.

As shown in the table above, the “own shares at t-1” variable is significant only in two cases, the last two columns of the table and considering a 10% level of confidence. More specifically, in both cases the variable in the model considering also other control variables such as RWA/total assets, market capital and cost/income. In both cases the impact of a unit change of “own shares at t-1” on the ROE is limited and equal to 0.0011 and 0.0010 respectively, holding all the other variables constant. The low values of the adjusted R-squared, shown at the bottom of the table, however, suggest that the explanatory power of these models, as compared to the ones shown in the table above is rather limited. Moreover, the results shown in the model are perfectly consistent with the reality. As an example, the variable “RWA/total assets” is strongly significant (using a 1% level of confidence) in all regressions ran and has a negative impact on the ROE. This is consistent with the economic literature as an increase of the RWA/total assets (ie the riskier assets), the bank will have an increase in the capital requirement, a probable deterioration of the quality held in its books and, consequently, a decrease of the ROE.

## 5. Conclusion

Buybacks, or repurchases of a company's own stock, have become a popular tool for capital management in the banking sector. However, concerns have been raised about the potential risks associated with the use of buybacks, particularly in relation to leverage management and systemic risk. This paper provides an overview of buyback practices in banking, analyses the implications of buybacks for profitability and shareholder value, and discusses the regulatory framework governing buybacks in banking. While buybacks can provide benefits to shareholders, their use has also raised concerns about potential risks to financial stability. One concern is that buybacks can be used as a tool for leverage management, as they can increase the debt-to-equity ratio of a bank. This can make the bank more vulnerable to financial distress in the event of an economic downturn or other adverse event. In addition, buybacks can reduce the amount of capital available for other purposes, such as investments or acquisitions, which can limit a bank's ability to respond to changing market conditions.

Buybacks can provide benefits to shareholders by increasing earnings per share (EPS) and signalling confidence to the market. By reducing the number of outstanding shares, buybacks can increase the value of each remaining share, which can enhance shareholder value. In addition, buybacks can signal to the market that the bank believes its shares are undervalued, which can result in an increase in the stock price.

The regulatory framework governing buybacks in banking varies by country and region. In the United States, the Federal Reserve has established guidelines for buybacks, including stress-testing requirements and limitations on the amount of capital that can be returned to shareholders. In addition, the Basel III regulatory framework includes provisions related to the use of buybacks in capital management. The guidelines require banks to maintain a minimum level of capital and to consider the impact of buybacks on their capital position.

There are several reasons why a bank may choose to engage in a buyback. One primary reason is to increase shareholder value by reducing the number of shares outstanding. By doing so, the bank can increase its earnings per share and return on equity. Additionally, by reducing the number of shares, the bank can also increase the market demand for its shares, leading to an increase in the share price.



Another reason why a bank may engage in a buyback is to return excess capital to shareholders. When a bank generates more capital than it requires for its operations, it may choose to distribute the excess capital to its shareholders in the form of dividends or buybacks. This is a common practice used by banks to manage their capital structure and optimize their return on equity.

In addition to shareholder value and capital management, buybacks can also be used to fend off hostile takeovers. In the event of a hostile takeover attempt, a bank may engage in a buyback to increase the price of its shares and deter potential acquirers. By increasing the share price, the bank can make it more expensive for the acquirer to purchase a controlling stake in the bank.

It is important to note that buybacks are not without risks. One potential risk is that the bank may overpay for its own shares, leading to a decrease in shareholder value. Additionally, the bank may reduce its cash reserves by engaging in a buyback, which could leave it vulnerable to unexpected market shocks or economic downturns.

In conclusion, buybacks are a common practice used by banks to manage their capital structure, increase shareholder value, and fend off hostile takeovers. While there are risks associated with buybacks, when executed properly, they can be an effective tool for optimizing a bank's return on equity and capital structure.

This paper aimed at testing the signalling hypothesis presented in the economic literature by analysing the potential impact of shares buyback on banks' performance as measured by the return on equity. In our analysis we found a limited significant linear relationship between share buybacks and the banks' return on equity. Further studies could leverage on this analysis and measure the impact of share buybacks on the performance of firms other than banks. The results of this analysis could also be further tested by enlarging the sample of banks considered or by lengthening the observation period.

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