Real Effects on Corporate Behaviors of Share Repurchases Legalization

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Abstract

This paper examines the real impacts of share repurchases legalization on corporate behaviors. To ensure causality, we use an exogenous shock induced by staggered share repurchases legalization in 17 markets across the world from the 1980s to 2000s, and we focus on firms for which stock buybacks are triggered by the legalization instead of firm-specific factors. We find that these share-repurchasing firms do not cut dividends as a substitution. The source for repurchasing shares comes from internal cash instead of external debt issuance, leading to reductions in capital expenditures and R&D expenses. This strategy boosts stock prices, whereas it is detrimental to long-run firm valuation, as implied by lower Tobin's Q and market capitalization and lower beneficiary ownership.

Keywords: Share repurchases, payout, investment, firm performance, innovation

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1. Introduction

Repurchasing shares is one of the major methods that firms make distributions to their shareholders, and it has gained increasing popularity over time. This strategy is important in financial markets because it matters for corporate behaviors. For instance, existing studies document that repurchasing shares is associated with lower dividends, lower cash holdings, and lower investments (Grullon and Michealy 2002 & 2004; Skinner 2008). In terms of the relationship between share repurchases and stock or operating performance, some papers present a negative correlation (Chen and Wang 2012), whereas others argue that share repurchases are correlated with higher firm value (Haw, Ho, Hu, and Zhang 2011), higher stock return (Comment and Jarrell 1991; Ikenberry, Lakonishok, and Vermaelen 1995, Barth and Kasznik 1999; Ben-Rephael, Oded, and Wohl 2014, Dittmar and Field 2015), and higher operating performance (Lie 2005; Gong, Louis, and Sun 2008). In general, buying back shares offers a good signal about firm undervaluation, but this strategy may also imply that firms have no other growth opportunities to invest in. Although these implications are controversial, it is a census that share repurchases are related to firm performance.

Given the importance of share repurchases for firm operations, our study takes one step further through two aspects. First, people now regard buying back stocks as a common payout strategy that is naturally allowed. However, in many countries or regions, share repurchases were illegal or unpopular until the 1980s. Few works have investigated the influences of the law change related to share repurchases, mainly due to data limitation about share repurchases legalization. Therefore, we fill this gap in the literature by manually reading over legal filings and relevant documents to identify the exact timing to allow for share repurchases in a financial market, and then we examine the real effects of this legalization on corporate behaviors.

Second, the setting of using share repurchases legalization helps to mitigate the endogeneity problem. Most of prior studies mainly talk about the correlation instead of the

causality, with only a few exceptions that employ either an event study of Sarbanes-Oxley Act (Chen and Huang 2013), a propensity score matching (Cheng, Harford, and Zhang 2015), or a regression discontinuity design approach using earnings forecast (Almeida, Fos, and Kronlund 2016). We enrich the identification strategies through examining a subsample of firms buying back shares shortly after the law change and in a special sample of countries without any private or open-market share repurchases before the legalization. By requiring no share repurchases cases before the legalization in a market, we identify the timing that a market started to allow for share repurchases. By focusing on those firms repurchasing shares within a short time window after the legalization year, we make sure that these buybacks are triggered by the law change instead of firm-specific factors or other economic conditions. Moreover, we also use the Weibull hazard model to make sure that the timing of share repurchases legalization is not related to pre-existing business conditions, which further ensure the exogeneity of the legalization events.

Using this exogenous shock induced by staggered legalization of share repurchases in 17 countries or regions all over the world during the 1980s and 2000s, we find that share repurchases legalization does have significant influences on corporate behaviors, including payout policies, investment and financing strategies, stock return, and long-term firm valuation.

To be specific, we find that treasury shares and total payouts are significantly higher after the legalization. The increases in share repurchases and total payouts after the legalization account for 94.8% and 47.0% of their corresponding average values, respectively. So, firms do make use of the law change to buy back a lot more stocks, which is consistent with Banyi, Dyl, and Kahle (2008). However, different from various studies documenting a substitution effect between share repurchases and dividend payments (Grullon and Michaely 2002; Skinner 2008), we do not find any significant dividend cut after the legalization of share repurchases.

In terms of the sources for share repurchases, we find that firms mainly rely on internal cash holdings instead of external debt financing. Net debt issuance after the legalization declines by around 2% relative to lagged total assets, and cash holdings decline by more than 6.3% relative to adjusted total assets. Moreover, because cash holdings are used to buy back stocks, asset acquisitions do not increase, and the long-run investments in capital expenditures and R&D activities drop significantly. No influence on assets acquisitions differs from Aboody, Kasznik, and Williams (2000) that find a reduction in M&A activities following share repurchases, while the negative relationship with cash holdings, capital expenditures, or R&D expenses is consistent with existing papers.

The rationale for sticky dividends, higher total payouts, and lower investments after share repurchases legalization is as follows. Before the legalization year, dividends payment is the only available payout policy. Because firms are usually reluctant to cut dividends, firms tend to make low distributions and make high investments. After stock buybacks become legalized, dividends are still at its binding level, but firms can repurchase more shares to raise total payouts. Because capital resources are used to buy back shares, there are lower resources allocated to capital expenditures and R&D expenses, leading to lower investments.

Moreover, the reason for firms having incentives to use money to buy back more shares is that share repurchases can boost stock prices. Consistent with intuition and also similar to prior literature, we observe positive market reactions to share repurchases legalization, i.e., higher buy-and-hold and abnormal stock returns, which implies that the market interprets stock buybacks as a positive signal to the public. Consistent with the higher stock return after the legalization years, we observe an increase in short-run firm value, measured by either Tobin's Q or market capitalization. However, contradictory with our intuition, we find that firm value in a long run declines, as indicated by lower Tobin's Q and lower market capitalization starting

from three years after the legalization of share repurchases. This reduction in long-run firm value is consistent with reductions in capital expenditures and R&D expenses.

All these results suggest that, after the legalization of share repurchases, firms use cash to buy back shares and boost their stock prices, but this strategy undermines the long-run firm value because firms must sacrifice long-run investments and innovations. Moreover, firm insiders, such as top executives and board members, should be informative about the real purpose of stock repurchases, and hence they tend to cash out when the stock prices have been raised by share repurchases, leading to lower beneficiary ownership after the legalization year.

In addition, we conduct a group of cross-sectional analyses. We find that additional price and volume restrictions weaken the real effects of share repurchases legalization on firm operational behaviors, because repurchases restrictions lower the chances for firms to take advantage of share repurchases to boost short-term stock prices and hurt long-run firm value. In contrast, if the net tax rate on cash dividends is higher in a market, the incentive to buy back shares tends to be higher, and hence firms are more likely to spend cash on share repurchases and reduce their capital expenditures as well as R&D expenses. The last group of cross-sectional analyses is in terms of financial constraint. We find that, if firms face a higher financial constraint as implied by a higher KZ index, firms are less likely to take advantage of the share repurchases legalization because of the lack of financial resources.

Our study makes two contributions to the literature. The first contribution is to the share repurchases literature. On one hand, we overcome the data limitation and conduct a comprehensive international study about share repurchases legalization. On the other hand, we enhance the identification strategy by focusing on those share-repurchasing firms motivated by the exogenous law change. Our empirical analyses show that share repurchases legalization does affect corporate behaviors. Some of the influences of share repurchase legalization are consistent with previous studies, such as lower cash holdings (e.g., Grullon and Michaely 2004),

lower investments (e.g., Chen and Wang 2012), and higher stock returns (e.g., Dittmar and Field 2015). These results suggest that firms use cash and cut investments to buy back shares and boost their stock prices.

More importantly, we have some findings that differ from existing literature. For instance, there is no significant dividend cut following the legalization of share repurchases, which disproves the substitution effect between share repurchases and cash dividends (e.g., Skinner 2008). We find that net debt issuance declines after share repurchases legalization, implying that firms do not use external capital to finance share repurchases shortly after the legalization. We observe a reduction in long-run firm value after share repurchases legalization, and this is the opposite of Haw et al. (2011) that finds a positive correlation between stock buybacks and firm value.

The second contribution is to the firm investment literature. The empirical results offer one rationale for the negative influences of share repurchases on investments. Shortly after share repurchases become legalized, the major incentive for firms buying back shares is to boost stock prices. Because they finance these stock buybacks using cash, they do not have enough capital allocated to long-run investments, especially capital expenditures and R&D activities. These lower investments in R&D related activities result in a long-run reduction in firm value. Meanwhile, firm insiders who are more informative should know well that using share repurchases to boost stock prices is detrimental for long-run firm performance. So, these firm insiders tend to sell their ownership at a high price level after the legalization of share repurchases.

The rest of the paper is organized as follows. Section 2 introduces the background of share repurchases legalization. Section 3 describes our sample. Section 4 presents the empirical results. Section 5 concludes.

2. Staggered Legalization of Share Repurchases

Although there have been some studies discussing the behavior of repurchasing shares, the attention on share repurchases legalization is still limited. Before a country or region legally allows share repurchases, firms have no opportunity to do so. In reality, most major financial markets prohibited share repurchases until the 1980s when the restrictions were gradually removed. For example, the United States passed the SEC Rule 10b-18 in 1982 to eliminate investors' concern of being prosecuted as manipulating the market for buying back stocks.[1] Canada legalized share repurchases under Canada Business Corporations Act in 1985. Spain legalized share repurchases under Spanish Company Law in 1989. This trend continuously spread over the world in the 1990s and 2000s.

The staggered share repurchases legalization provides a unique setting to investigate the real effects of share repurchases legalization on firm operations. Utilizing the variation of legalization years, we employ a difference-in-difference (DID) methodology similar to Bertrand and Mullainathan (2003) and Beck, Levine, and Levkov (2010). In these two papers, each US state adopted the antitakeover laws (Bertrand and Mullainathan 2003) or banking legalization laws (Beck, Levine and Levkov 2010) in different years, while in our setting, each country legalizes the share repurchases in different years. By comparing firm operations before and after the legalization, we infer the real effects of share repurchases on corporate behaviors.

To identify the years of share repurchases legalization for all countries or regions with reasonably functioning stock markets, we manually collect information from various sources of legal filings. We carefully read over all relevant academic articles (e.g., Kim, Schremper and Varaiya, 2004), industry reports (e.g., IBA Corporate and M&A Law Committee Treasury Shares Guide, 2014; Glass Lewis Policy Guidelines, 2017), government websites (e.g., Capital Markets Law of Kuwait, 2010), regulatory and legal authorities' websites (e.g., Administration

[1] The information of the United States is only for reference but not used in our main analyses.

of Repurchase of Public Shares by Listed Companies Procedures in China, 2005), stock exchanges' websites and communication with the legal institutions.

In some cases, the deregulation was not achieved via a single law adoption; rather, the process was gradually accomplished throughout passages of multiple laws. So, we use the last year of the most important law adoption as the legalization year. For example, Japan removed the restriction gradually after revising two laws - Commercial Law in 1994 and Tax Law in 1995; and we treat the year 1995 as the legalization year.

For some markets, the SDC Database records some self-tender repurchases cases before the legalization of share repurchases. We exclude these markets because we are interested in the influences of legalized stock buybacks. To ensure a clear causality identification as discussed in next section, we focus our analyses to the firms buying back shares within two years after the legalization of share repurchases, and hence we also exclude those markets in which the first appearance of share repurchases happened more than two years after the law change. Moreover, we require sufficient financial information available in the Worldscope Database for a given market, such as at least 200 active and inactive companies, and at least five years of data before the legalization year. So, in the end, we hand-collect detailed information about share repurchases legalization in 17 markets including Canada, mainland China, Germany, Greece, Israel, Japan, Kuwait, Netherlands, New Zealand, Russia, Singapore, South Africa, South Korea, Spain, Switzerland, Taiwan, and Turkey.

Figure 1 presents the annual number of legalization markets over time. As shown, the distribution of share repurchases legalization is dispersed over different years instead of clustered within a few years. Besides Canada and Spain legalizing share repurchases in the late 1980s, 9 markets deregulated stock buybacks in the 1990s, and another 6 markets started to allow this strategy in the 2000s. Table 1 lists the legalization years and selected referring sources for 17 markets in our main analyses, as well as the United States for reference. Column

3 shows the timing of the first appearance of share repurchases cases, and column 4 refers to the deal number for the first repurchase case as recorded by SDC Database.[2]

3. Sample Description

3.1. Summary Statistics

We construct our sample by downloading all firm-year observations from Thomson Reuters Worldscope Database from 1980 to 2017. We take two steps to obtain a clean identification of the causal effects of share repurchases. First, as emphasized in the previous section, we exclude those markets with self-tender repurchases cases before the legalization year. By doing so, we ensure that our sample firms have no legal channel to buy back stocks until the legalization of open-market share repurchases. Second, we focus on the firms that indeed buy back their own shares shortly after the legalization year. If a stock buyback happens long after the legalization year, we are not sure whether this action is driven by firm-specific factors such as changes in growth opportunities. In contrast, by restricting that firms must have conducted some share repurchases during two years after the legalization year, we make sure that these stock buybacks are triggered by the law change and hence are exogenous to other firm-specific factors.

After all the filtering procedures, we end up with a panel dataset with 15,257 observations of 967 firms from 1980 to 2017 in 17 countries or regions. Table 2 presents the summary statistics of all relevant variables in our empirical analyses, and Appendix Table A2 presents detailed definitions for all dependent and explanatory variables. As shown in Table 2, about 76.7% of firm-year observations are post-legalization observations. The average

[2] Information from the SDC database is used for checking the validity of collected legalization years, because we require that the first appearance of share repurchases happened within two years after the legalization year. Legalization information for a more comprehensive sample before imposing this restriction is shown in Appendix Table A1. In our main analyses, we use the Worldscope Database to identify the actual buyback records (item 4751) at the firm-year level.

logarithm of total assets in our sample is about 20.61, the average logarithm of net sales is 20.02, the average ROA is 5.66%, and the average Tobin's Q is about 1.41.

Figure 2 displays the number and value of share repurchases around the legalization years based on data from the SDC Database aggregated at the country-year level. As shown, there is no share repurchases case before the legalization year. Just in the legalization year, there are 73 cases of share repurchases involving $ 1.9 billion. In the second year after the legalization year, the number of share repurchases increases to 258 and the total value of share repurchases increases to over $24 billion. This figure confirms that our setting identifies the starting point of a market to allow for legal open-market share repurchases. The sharp increase in the number and value of share repurchases during the two-year window after the legalization year implies that firms do take advantage of the law change to buy back shares shortly after this strategy becomes legalized.

3.2. Timing of Share Repurchases Legalization

Our empirical analyses rely on the assumption that the passage and the legalization year of share repurchases are not a function of pre-existing business conditions. To validate this assumption, we follow Acharya, Baghai, and Subranmanian (2013) and Gao, Hsu, Li, and Zhang (2018) and estimate the Weibull hazard model in which the "failure event" is the legalization of share repurchases in a given market. We regress the legalization dummy on one of the following variables calculated by taking the averages of all firms in a market-year: *Average Tobin's Q*, *Average Market Capitalization*, *Average Buy-and-hold Return*, *Average Abnormal Stock Return*, *Average Dividend*, *Average Cash*, *Average Capital Expenditure*, and *Average R&D*. We also control for *GDP (log)*, *GDP per capita (log)*, *GDP Growth*, *Stocks Turnover*, *Stocks Traded / GDP*, *Market Capitalization / GDP*, *Tax Revenue / GDP*, and *Inflation*. The definitions and summary statistics for all these market-year level variables are

in Appendix Tables A3 and A4, respectively. The regression results for the Weibull hazard model are in Appendix Table A5.

As shown, the coefficients on the market-year averages are not statistically significant in all regressions, which implies that the legalization event is unrelated to these pre-existing business conditions. Therefore, the results based on the Weibull hazard model further ensure that share repurchases legalization years are unanticipated, so we can use them to identify the causal effect on firm operational behaviors.

4. Empirical Results

In this section, we examine the real effects of share repurchases legalization on firm behaviors, including payout policies, investment and financing strategies, stock return, and long-run firm valuation. The following equation describes our main regression model:

$$Y_{ijt} = \beta_0 + \beta_1 Legalization_{jt} + \beta_2 X_{ijt} + FE_{ij} + FE_t + \varepsilon_{ijt}, \quad (1)$$

where Y_{ijt} denotes a variable characterizing one aspect of the operational behaviors for firm *i* in country *j* at year *t*. The dummy $Legalization_{jt}$ equals to one if year *t* is after the legalization of share repurchases in country *j*, otherwise, it equals to zero. The vector X_{jt} represents for a group of firm-level variables, including total assets, net sales, net income, leverage, ROA, sales growth, EBIT-sales ratio, PPE-sales ratio, R&D expenses, quick ratio, and market share. Detailed definitions for all relevant variables are in Appendix Table A2. We also control firm and year fixed effects, and we cluster standard errors at the firm level.

4.1. Payout Policies

The first issue we would like to investigate is that, after share repurchases become legalized in a market, how corporate payout policies change, and whether share repurchases substitute for cash dividends, leading to dividend cuts. To address this question, we define the

dependent variable in equation (1) as one of the following three variables: the ratio of share repurchases to total assets ($Repurchase_{ijt}$), the ratio of dividends to total assets ($Dividend_{ijt}$), and the ratio of total payout to total assets ($Total\ Payout_{ijt}$).[3]

Table 3 presents the results. Columns (1) and (2) illustrate the regressions for share repurchases. As shown, share repurchases do increase significantly after this strategy becomes legalized. This positive relationship is mechanical because we restrict our sample firms to be those buying back shares within two years after the law change. However, we would like to emphasize the large size of economic significance. Controlling for all firm-level variables as in column (2), share repurchases legalization raises $Repurchase_{ijt}$ by 94.8% (=0.493/0.52) of its average value. Similarly, the regressions for the number and value of treasury shares in Appendix Table A6 provide consistent results: the legalization of share repurchases significantly increases the number and value of treasury shares by 41.4% (=0.823/1.99) and 46.1% (=0.830/1.80) of their mean values, respectively.

In contrast to the statistical and economic significance for the regressions on share repurchases, the coefficients on the legalization dummy are not significant for the regressions on dividends (columns 3 and 4). Therefore, share repurchases legalization does not alter the pattern for corporate cash dividends. In other words, cash dividends still exhibit the sticky trend after share repurchases legalization, and there is no substitution between share repurchases and dividend payments. These results are different from previous studies finding a negative correlation between share repurchases and dividend payments, such as Grullon and Michaely (2002) and Skinner (2008).

[3] To avoid the mechanical influence of share repurchases on total assets, we adjust total assets by adding back the share repurchases item. We do this adjustment for all assets-scaled variables throughout this paper. Following Almeida, Fos, and Kronlund (2016), we also capture repurchases using the number and value of treasury shares. The corresponding results are in Appendix Table A6.

The last two columns in Table 3 further show the regressions on the total payout ratio. Using column (6) as an illustration, the coefficient on the legalization dummy is significantly positive, and the total payout ratio increases by 47.0% (=1.226/2.61) of the mean value after share repurchases legalization, holding all else equal. Taking all these findings together, share repurchases legalization leads to more stock buybacks but does not result in dividend cuts. Therefore, share repurchases do not serve as a substitute for cash dividends in this scenario, and total payouts become higher after share purchases legalization.

These findings of payout policies are intuitive. Before the legalization of share repurchases, firms can only use cash dividends to make distributions. Because dividend policy is sticky, and firms are usually reluctant to cut dividends, this payout binding constraint results in low distributions and high investments. In contrast, after share repurchases become legalized, firms can use stock buybacks to push up total payouts. In this case, capital allocated to investments tends to be lower, and, to further confirm this logic, we will examine corporate investment policies in the next sub-section.

4.2. Sources to Finance Share Repurchases

In this sub-section, we examine how firms finance increasing stock buybacks after share repurchases legalization. In general, the financing sources in a company come from either internal cash or external financing. So, we first analyze the changes in these funding sources before and after the legalization years. Specifically, we measure external debt financing by the net issuance of total debt relative to lagged total assets ($Debt\ Issuance_{ijt}$), and we measure internal cash holding by the cash to total assets ratio ($Cash_{ijt}$). Using these two measures as the dependent variables in equation (1), columns (1) through (4) in Table 4 illustrate the regression results.

As shown in columns (1) and (3), net debt issuance significantly declines by 1.8% relative to lagged total assets after share repurchases legalization, and cash holdings significantly decline by 14.4% relative to adjusted total assets, respectively. The negative change of debt issuance implies that firms do not use external debt issuance to finance their increasing stock repurchases. The dramatic drop of cash holdings suggests that the major source for share repurchases comes from internal cash.

One potential argument for the reduction in cash holdings is that firms use cash to finance long-run investments. To disprove this possibility, we examine the changes in investment opportunities, as implied by the ratio of capital expenditures or net assets from acquisitions to adjusted total assets. The results are presented in columns (5) through (8) in Table 4. Columns (5) and (6) imply that $Capital\ Expenditures_{ijt}$ significantly declines by 1% relative to adjusted total assets after share repurchases legalization. This significant reduction in capital expenditures suggests that firms do not use cash to make more investments after share repurchases legalization, which further confirms that the primary source to finance share repurchases is from internal cash holdings. Moreover, for the regressions of $Net\ Assets\ from\ Acquisitions_{ijt}$ in columns (7) and (8), the coefficients on the legalization dummy are at most marginally significantly negative, implying little influence on assets acquisitions of share repurchases legalization. Although this result differs slightly from the negative correlation between M&A activities and share repurchases as documented by Aboody, Kasznik, and Williams (2000), it implies that firms at least do not increase assets acquisitions using their cash holdings after the legalization of share repurchases.

To further support the argument that firms sacrifice long-run investments for share repurchases using cash holdings, we regress R&D expenses and R&D growth on the legalization dummy and other controls following equation (1), and we present the results in Table 5. As shown by column (2), R&D expenses significantly decline by 17.6% (=0.174/0.99)

of its mean value after the legalization of share repurchases. R&D growth drops by an even larger magnitude, which accounts for 71.4% (=5.515/7.72) of its mean value as indicated by column (4). All these significantly negative coefficients on the legalization dummy for R&D regressions imply that firms have to cut their innovation activities after cash holdings are used to finance share repurchases. Considering that R&D investment is one of the primary channels for firm value creation, the significant reductions in R&D expenses and R&D growth are likely to hurt long-run firm valuation, and we will analyze this impact in later sections.

Comparing with previous studies that also find a negative correlation between share repurchases and cash or investments (e.g., Grullon and Michaely 2004, Chen and Wang 2012), we take one step further to demonstrate a causal relationship that reductions in cash holdings and investments are triggered by share repurchases legalization. Our results in Table 4 and Table 5 show that the primary source for shares repurchases after the legalization comes from internal cash rather than external debt issuance. To fulfill the objective of buying back shares, firms have to sacrifice their long-term investment opportunities, such as cut capital expenditures and R&D expenses.

4.3. Stock Return

The next question is why firms are more willing to forgo long-term investments and use cash to buy back shares after the legalization of share repurchases. A simple answer is that this strategy could boost the stock prices, although it may hurt the long-run benefits. We illustrate this argument in the following two sub-sections. In this sub-section, we first estimate the influence of share repurchase legalization on stock return. We calculate stock return using two methods: the raw value of the annual buy-and-hold return ($Buy - and - hold\ Return_{ijt}$), and the abnormal stock return relative to the overall market return ($Abnormal\ Stock\ Return_{ijt}$).

Using these two measures as the dependent variables in equation (1), we present the regression results in Table 6. In all four columns, the coefficients on the legalization dummy are significantly positive. No matter whether we use raw buy-and-hold return or abnormal return adjusted for market performance, annual stock return increases by almost 7% after the legalization of share repurchases. This positive market reaction to share repurchases is similar to most findings in existing literature, such as Comment and Jarrell (1991), Ikenberry, Lakonishok, and Vermaelen (1995), Barth and Kasznik (1999), Ben-Rephael, Oded, and Wohl (2014), and Dittmar and Field (2015). Overall, it is intuitive to predict a positive relationship between share repurchases and stock return, because firms should be more likely to buyback stocks when their shares are undervalued. Knowing that share repurchases serve as a positive signal to the market, firms may use share repurchases to boost their stock prices after this strategy becomes legalized.

4.4. Long-Run Firm Value

Although share repurchases can boost per-share stock prices, total firm value is not necessarily higher considering that firms cut their long-run investments in R&D activities. So, in this sub-section, we investigate the impact of share repurchases legalization on firm value. Because the negative consequence of lower investments on firm value may not appear until a long period after the share repurchases legalization, we analyze the long-run yearly trend of firm value after the legalization of share repurchases. Specifically, we estimate the following variation form for equation (1):

$$Y_{ijt} = \beta_0 + Legalization_{jt}\left(\beta_1 + \beta_{2K}\, K\ Years\ After_{jt}\right) + \beta_3 X_{ijt} + FE_{ij} + FE_t + \varepsilon_{ijt}, \quad (2)$$

where $Legalization_{jt} * K\ Years\ After_{jt}$ is equal to one in the K-th (K=1, 2, …, or 5) year after share repurchases legalization, and zero otherwise, and the definitions for all other variables are the same as in equation (1). The dependent variable is either Tobin's Q ($TobinQ_{ijt}$)

or market capitalization ($Market\ Capitalization_{ijt}$). Because our sample focuses on firms buying back shares within two years after the legalization of share repurchases, we adjust for the share repurchases item in the denominator when we calculate the value of Tobin's Q. Also, we measure market capitalization using the natural logarithm of its raw value plus one.

The results are shown in Table 7. As shown by columns (1), (2), (6), and (7), the firm value becomes significantly higher within two years after the legalization year, suggesting that firms may enjoy temporary stock price appreciation shortly after they buy back stocks. However, columns (3)-(5), and (8)-(10) show that firm value starts to decline three years after the legalization year, which implies that the detrimental effect of share repurchases legalization on firm value is much severer in a longer term. This long-run negative influence of share repurchases on firm value is the opposite of the findings by Haw et al. (2011), while it is consistent with firms cutting capital expenditure and R&D expenses as indicated by our Table 4 and Table 5. To boost stock prices through buying back shares, firms have to spend their cash holdings and give up valuable investment opportunities by cutting their capital expenditures and R&D expenses, which hurts firm valuation in a long run.

Furthermore, if the true objective of buying back shares is to boost stock prices at a cost of long-run valuation, firm insiders, such as top executives and board members, should be more informed about this incentive. They should know well that high stock returns induced by increasing share repurchases are not sustainable in the long run and the firm value will decline eventually due to the lack of valuable investments. Given this expectation, firm insiders tend to sell holdings a high price level shortly after stock buybacks, so we predict that the large beneficiary ownership in these share-repurchasing firms should be lower after the legalization of share repurchases. To test this prediction, we use changes in the number and the value of beneficiary ownership as dependent variables and run regressions based on equation (1).

The results in Table 8 are consistent with our predictions. The coefficients on the legalization dummy are significantly negative. Controlling for all firm-level variables, the number and the value of beneficiary ownership decline by 3.174% and 4.150% after the legalization of share repurchases, respectively, which account for half of the corresponding standard deviations. Therefore, firm insiders do have a strong tendency to make use of their informational advantage and sell their holdings at a high price shortly after the firm buys back its shares.

4.5. Cross-Sectional Analyses

In this sub-section, we conduct a group of cross-sectional analyses to investigate whether the share repurchases legalization imposes different impacts on different types of firms. To be specific, we add an interaction term with the legalization dummy in equation (1), and construct the following regression model:

$$Y_{ijt} = \beta_0 + \beta_1 Legalization_{jt} + \beta_2 Legalization_{jt} * Factor_{ijt} + \beta_3 Factor_{ijt} + \beta_4 X_{ijt} + FE_{ij} + FE_t + \varepsilon_{ijt}, \quad (3)$$

where Y_{ijt} denotes a variable characterizing one aspect of the operational behaviors for firm *i* in country *j* at year *t*. Specifically, we use share repurchases to capture the direct outcome of payout changes, and we use cash to measure primary resources for buying back stocks. We measure investments using capital expenditures and R&D expenses. We measure market reaction using buy-and-hold return, and we measure firm value using Tobin's Q. $Factor_{ijt}$ is one of the following variables: 1) price and volume restrictions on share repurchases in market *j*; 2) net tax rate on cash dividends in market *j* at year *t*; 3) financial constraint measured by KZ index for firm *i* in market *j* at year *t*. All other explanatory variables are the same as in equation (1).

4.5.1. Repurchases Restrictions

Our first group of cross-sectional analyses is about the trading restrictions on share repurchases. Although the markets in our sample all legalized share repurchases at a specific time, several markets still impose some price and/or volume restrictions on share repurchases. Price restrictions contain all restrictions on the highest price of share repurchases, including "no higher than 5% above the average price", "no higher than 10% above the average price", "no higher than 15% above the average price", "no higher than the most recent price", and "must be purchased at the market price". Volume restrictions contain all restrictions on the volume of share repurchases, including "maximally 5% of total shares", "maximally 10% of total shares", and "maximally 20% of total shares". Detailed information about price and/or volume restrictions for our sample markets are in Appendix Table A7.

If the results in Table 3 through Table 8 are indeed the consequences of share repurchases legalization, we expect to observe weaker impacts on firm behaviors in the markets with trading restrictions because these restrictions may prevent firms from fully realizing their demand for share repurchases. To test this prediction, we replace $Factor_{ijt}$ in equation (3) with a time-invariant dummy, $Restriction_j$, which equals one if market *j* has both price and volume restrictions on share repurchases and zero otherwise.[4] The variable of interest is the interaction term $Legalization_{jt} * Restriction_j$, which equals one if both price and volume restrictions exist after legalization and zero otherwise. Table 9 presents the regression results.

Consistent with our predictions, the coefficients on $Legalization_{jt} * Restriction_j$ for all the regressions have the opposite signs compared with $Legalization_{jt}$. Because of the existence of price and volume restrictions, the increase in share repurchases after the legalization years is smaller (column 1), and hence the need for reducing cash holdings (column

[4] Because this restriction dummy does not vary over the years, the baseline coefficient on $Restriction_j$ is absorbed by the firm fixed effects.

2) and cutting investments (columns 3 and 4) to finance stock buybacks is smaller. A smaller increase in share repurchases then lead to lower market price appreciation (column 5), and less reduction in investments lead to less reduction in firm value (column 6).

4.5.2. Net Tax Rate on Dividends

Our second cross-sectional test is about the tax incentive for buying back stocks. One consideration for firms using share repurchases instead of distributing cash dividends is to attract investors at high income tax brackets. Because cash dividends are usually taxed as ordinary income while proceeds from share repurchases are usually taxed as capital gain, investors at high income tax brackets face a serious problem of double taxation. If the net tax rate on dividends is higher in a market, firms in this market may have more incentive to take advantage of share repurchases after this strategy becomes legalized. So, we expect that, in the markets with higher net tax rates on dividends, the results of share repurchases legalization on firm behaviors as documented in Table 3 through Table 8 should be stronger.

Therefore, we replace $Factor_{ijt}$ in equation (3) with $Net\ Tax\ Rate\ on\ Dividend_{jt}$, which is directly collected from the OECD Tax Database and measures the effective statutory tax rate on dividend income for investors in country *j* at year *t*. This variable considers the tax rates on shareholders at all levels, including corporate income taxes, personal income taxes, and all types of reliefs and grow-up provisions. Table 10 presents the regression results.

As shown by the coefficients on $Legalization_{jt} * Net\ Tax\ Rate\ on\ Dividend_j$ in the markets with a higher net tax rate on dividends, firms significantly buy back more shares after the legalization of this strategy (column 1), which dramatically boost the stock prices (columns 5). The financing resources for share repurchases are from cash holdings (column 2), and firms also have to cut capital expenditures and R&D expenses (columns 3 and 4).

4.5.3. Financial Constraint

Last but not the least, we then analyze whether financial constraints affect firms' incentive to take advantage of share repurchases to influence the stock price or firm value after share repurchases become legalized. Our results in Table 4 imply that the primary resources for buying back stocks are from internal cash holdings and reductions in investments. So, if a firm is financially constrained in general, it may have less incentive to do stock buybacks due to the lack of available financing resources. Following this logic, we predict that the impacts of share repurchases legalization on firm behaviors should be smaller for firms with a higher financial constraint.

Following Kaplan and Zingales (1997), we capture the financial constraint using the Kaplan-Zingales Index ($KZ\ Index_{ijt}$). This index measures corporate relative reliance on external financing, and a higher value indicates a higher likelihood of experiencing difficulties to finance ongoing operations when the financial conditions tighten. We replace $Factor_{ijt}$ in equation (3) with $KZ\ Index_{ijt}$, and Table 11 presents the regression results.

As shown, the coefficients on the interaction term $Legalization_{jt} * KZ\ Index_{ijt}$ are all in the opposite direction of the baseline coefficients on $Legalization_{jt}$, which implies that the financial constraint weakens firms' ability to take advantage of share repurchases to influence business operations. To be specific, the baseline results show that firms generally buy back more shares to boost the stock price after the legalization of share repurchases, although it hurts the long-run firm value measured by Tobin's Q or market capitalization. However, firms with a higher financial constraint are more reluctant to do so as indicated by a smaller increase in share repurchases, and hence the reductions in cash holdings, capital expenditure, and R&D expenses are smaller, the market reaction is less positive, and the influence in firm value is also less negative.

5. Conclusions

This study investigates the real effects of share repurchases legalization on firm operations, such as payout policies, investment and financing strategies, stock return, and long-run firm valuation. In contrast to most existing studies focusing on the correlation, we identify the causal relationship by using an exogenous shock on share repurchases: staggered share repurchases legalization all over the world from the 1980s to 2000s. This legalization process is unrelated to firm growth opportunities or other economic factors. To further ensure a clean identification, we exclude those markets with private or open-market share repurchases before the legalization, so that the legalization year is the starting point of allowing for share repurchases in a market. We also focus on a subsample of firms buying back shares within two years after the legalization of share repurchases, because these buybacks are more likely to be triggered by the law change rather than firm-specific reasons.

We find significant increases in repurchases and total payouts following share repurchases legalization, suggesting that firms do take advantage of this law change and buy back their own stocks. However, share repurchases do not serve as a substitute for cash dividends, as indicated by no dividend cuts after share repurchases legalization. In terms of the financing sources for increased share repurchases, it is mainly from internal cash instead of external debt issuance. Moreover, firms tend to cut their capital expenditures as well as R&D expenses to finance share repurchases.

After share repurchases legalization, the stock return for share-repurchasing firms becomes higher, while the total firm value declines in the long run. These changes in stock return and firm value imply that firms may use share repurchases to boost stock prices, although this strategy undermines long-run firm value. Besides, the lower beneficiary ownership after share repurchases legalization further confirms that firm insiders, such as top executives and board members, are more informative about the true incentive of buying back stocks shortly

after the legalization, and they tend to sell their holdings when the stock price has been raised by share repurchases.

Our cross-sectional analyses further show that the real effects of share repurchases legalization on firm operations are weaker in the markets with trading restrictions on share repurchases, stronger in the markets with higher net tax rates on dividend, and weaker for firms facing a higher financial constraint.

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Figure 1. Staggered Legalization of Share Repurchases

This figure presents the staggered legalization of share repurchases in 18 markets, including 17 markets used in the analyses and the United States.[6] Two markets legalized share repurchases before 1990, nine markets legalized share repurchases during the 1990s, and six markets legalized share repurchases during the 2000s.

[6] The United States information is only for reference but not used in main analysis.

Figure 2. Share Repurchases around Legalization

This figure presents the annual total number and total value of share repurchases cases from two years before to two years after the legalization years in 17 markets. The share repurchases include both private tender offers and open-market repurchases. For example, the number in the left-hand vertical axis in "–1" represents the total number of share repurchases one year before each market's legalization, and the number in the right-hand vertical axis in "2" represents the total value of share repurchases in the second year after each market's legalization.

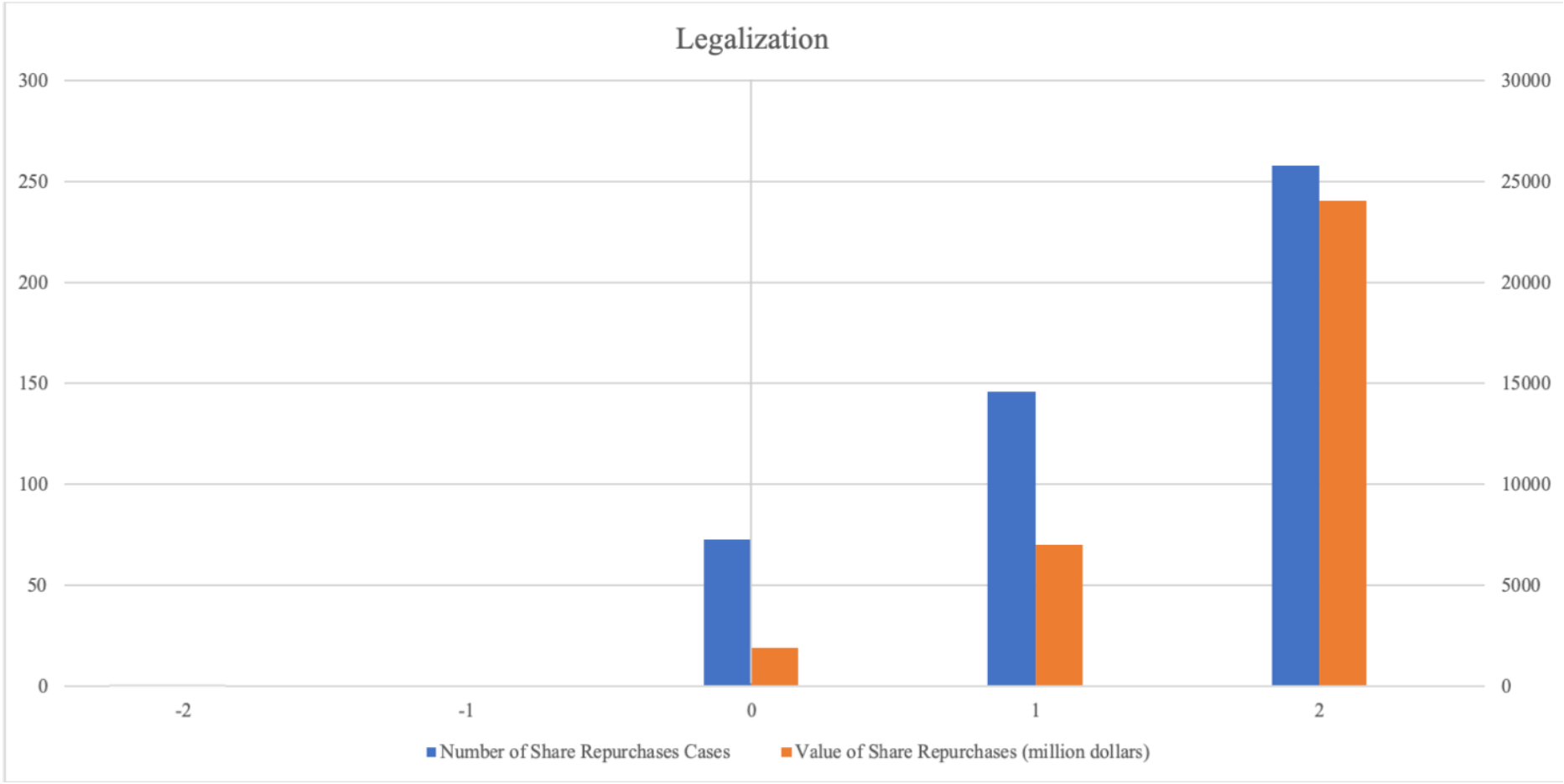

Table 1. Legalized Year of Share Repurchases

Country	Legalized Year	Law	Referring Literature	First Appearance of Repurchase Case	SDC Deal Number
Canada	1985	Canada Business Corporations Act	IBA Corporate and M&A Law Committee (2014); Anand (2015)	1985	97827040
China	2005	Administration of Repurchase of Public Shares by Listed Companies Procedures (Trial Implementation)	Administration of Repurchase of Public Shares by Listed Companies Procedures (2005)	2005	1672814040
Germany	1998	Aktiengesetz	Kim, Schremper and Varaiya (2004); Seifert and Stehle (2005)	1998	842806040
Greece	2003	The Commission Regulation	Drousia and Episcopos and Leledakis (2017)	2003	1402914040
Israel	1999	The Companies Law	IBA Corporate and M&A Law Committee (2014)	1999	942220040
Japan	1995	Commercial Law (1994), Tax Reform Act (1995)	Sabri (2003); Kim, Schremper and Varaiya (2004)	1995	450952040
Kuwait	2010	Capital Markets Law	Capital Markets Law (2018)	2011	2296984040
Netherlands	1992	Dutch Civil Code	IBA Corporate and M&A Law Committee (2014); Van Holder, Van de Kerckhove and Heyman (2015)	1993	332690040
New Zealand	1994	The Companies Act	Sabri (2003)	1994	447075040
Russia	1995	Federal Law on Joint Stock Companies (LJSC)	IBA Corporate and M&A Law Committee (2014); An Overview of the Glass Lewis Approach to Proxy Advice: Russia (2017)	1996	597023040
Singapore	1998	The Companies Act	Sabri (2003); Chua (2010)	1999	923168040
South Africa	2000	Listing Requirements	Bhana (2007)	2000	1017165040
South Korea	1994	Securities Act	Jung, Lee and Thornton (2005); Isa and Lee (2014)	1996	537334040
Spain	1989	Spanish Company Law	Lainez, Jarne and Callao (1999); Sotelo and Santiago (2010); Davies, Hopt, Nowak and Van Solinge (2013)	1990	165256040
Switzerland	1992	Swiss Company Law	Kim, Schremper and Varaiya (2004)	1993	332310040
Taiwan	2000	Securities and Exchange Act	Sabri (2003); Wang, Lin, Fung and Chen (2013)	2002	1278824040
Turkey	2009	The Commercial Law	Dizkırıcı (2013)	2010	2256287040
United States*	1982	SEC Rule 10b-18	Cook, Krigman and Leach (2003); Kim, Schremper and Varaiya (2004)		

* United States information is only for reference but not used in main analysis

Table 2. Summary Statistics

	Obs	Mean	Std. Dev	25%	Median	75%
			Dependent Variables			
Abnormal Stock Return	13,485	17.97	54.60	-13.20	8.15	35.83
Buy-and-hold Return	13,485	19.14	54.87	-12.16	9.27	37.09
Capital Expenditure	14,593	5.35	5.71	1.23	3.78	7.49
Cash	14,060	15.17	16.08	3.93	10.19	20.68
Change in Shares Number	4,058	2.80	7.51	0.00	0.24	2.01
Change in Shares Value	4,058	1.25	5.67	0.00	0.01	0.11
Debt Issuance	14,481	1.37	10.02	-2.00	0.23	4.93
Dividend	14,784	1.89	2.60	0.15	1.01	2.49
Market Capitalization (log)	11,173	20.03	1.82	18.78	19.87	21.18
Net Assets from Acquisitions	12,359	0.86	2.91	0	0	0.02
R&D	14,352	0.99	2.42	0	0	0.68
R&D Growth	14,352	7.72	38.76	0	0	1.43
Repurchase	12,921	0.52	1.38	0	0	0.20
Tobin's Q	11,081	1.41	0.88	0.97	1.18	1.55
Total Payout	12,823	2.61	3.59	0.33	1.36	3.32
Treasury Shares Number	10,640	1.99	3.94	0	0	2.20
Treasury Shares Value	10,640	1.80	3.92	0	0	1.70
			Independent Variables			
Legalization	15,257	0.77	0.42	1	1	1
Restriction	15,257	0.48	0.50	0	0	1
Net Tax Rate on Dividend	7,200	31.88	13.41	25	32	41.3
KZ Index	9,652	-1.80	4.47	-2.61	-0.26	0.86
			Control Variables			
Total Assets	15,257	20.61	1.99	19.24	20.33	21.77
Net Sales	15,257	20.02	2.17	18.83	19.94	21.28
Net Income	15,257	17.23	2.00	16.01	17.16	18.45
Leverage	15,257	22.68	17.67	7.69	20.55	34.75
ROA	15,257	5.66	5.41	1.89	4.19	7.60
Sales Growth	11,621	15.59	40.60	0.22	8.63	20.71
EBIT / Sales	11,621	13.52	16.59	5.56	9.42	16.37
PPE / Sales	11,621	100.33	125.14	29.43	62.39	121.26
Quick Ratio	11,621	1.37	1.59	0.69	0.99	1.52
Market Share	11,621	16.97	25.43	1.38	5.05	19.93

Table 3. Payout Policies

This table presents the impact of legalizing share repurchases on a firm's payout policies. The dependent variables of interest are *Repurchase*, *Dividend*, and *Total Payout*. The independent variable of interest is *Legalization,* which equals one in the years after market legalized share repurchases and zero otherwise. In columns with an odd number, we control for *Total Assets, Net Sales, Net Income, Leverage* and *ROA*. In columns with an even number, we further control for *Sales Growth, EBIT / Sales, PPE / Sales, Quick Ratio* and *Market Share*. We also control the firm and year fixed effects. The p-values clustered at firm level are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Repurchase		Dividend		Total Payout	
Legalization	0.396***	0.493***	0.111	0.121	1.010***	1.226***
	(0.00)	(0.00)	(0.22)	(0.30)	(0.00)	(0.00)
Total Assets	-0.201***	-0.259***	-0.174**	-0.347**	-0.396***	-0.475**
	(0.00)	(0.00)	(0.03)	(0.01)	(0.01)	(0.03)
Net Sales	0.0619***	0.121**	0.189***	0.509***	0.203**	0.452**
	(0.01)	(0.05)	(0.00)	(0.00)	(0.04)	(0.01)
Net Income	0.121***	0.122***	-0.0367	-0.0826**	0.107*	0.0309
	(0.00)	(0.00)	(0.19)	(0.04)	(0.07)	(0.64)
Leverage	-0.00357**	-0.00470**	-0.0124***	-0.0112***	-0.0168***	-0.0180***
	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
ROA	-0.00777	-0.0184**	0.134***	0.144***	0.141***	0.151***
	(0.25)	(0.05)	(0.00)	(0.00)	(0.00)	(0.00)
Sales Growth		-0.000461		-0.00464***		-0.00587***
		(0.26)		(0.00)		(0.00)
EBIT / Sales		0.00453**		-0.00162		3.64e-05
		(0.02)		(0.59)		(1.00)
PPE / Sales		-5.05e-05		-0.000546		-0.000965
		(0.82)		(0.27)		(0.17)
Quick Ratio		0.0271		0.0716**		0.0982**
		(0.13)		(0.01)		(0.03)
Market Share		-0.00177		-0.00390		-0.00418
		(0.41)		(0.21)		(0.36)
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Firm Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Cluster at Firm Level	Yes	Yes	Yes	Yes	Yes	Yes
Observations	12,921	10,060	14,784	11,346	12,823	9,998
R-squared	0.242	0.247	0.581	0.610	0.488	0.508

Table 4. Sources to Finance Share Repurchases

This table presents the impact of legalizing share repurchases on a firm's resource allocation. The dependent variables of interest are *Debt Issuance*, *Cash*, *Capital Expenditure*, and *Net Asset from Acquisitions*. The independent variable of interest is *Legalization,* which equals one in the years after market legalized share repurchases and zero otherwise. In columns with an odd number, we control for *Total Assets, Net Sales, Net Income, Leverage* and *ROA*. In columns with an even number, we further control for *Sales Growth, EBIT / Sales, PPE / Sales, Quick Ratio* and *Market Share*. We also control the firm and year fixed effects. The p-values clustered at firm level are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Debt Issuance		Cash		Capital Expenditure		Net Assets from Acquisitions	
Legalization	-1.808***	-0.617	-2.179***	-0.958**	-1.088***	-0.847***	-0.236*	-0.249
	(0.00)	(0.13)	(0.00)	(0.05)	(0.00)	(0.00)	(0.09)	(0.18)
Total Assets	2.355***	4.774***	0.00295	1.872***	-0.0388	-0.340	0.100	0.508***
	(0.00)	(0.00)	(1.00)	(0.00)	(0.79)	(0.24)	(0.22)	(0.00)
Net Sales	-0.488**	-3.931***	-1.071**	-2.175***	0.147***	0.537*	0.0368	-0.505***
	(0.01)	(0.00)	(0.02)	(0.00)	(0.01)	(0.06)	(0.25)	(0.00)
Net Income	0.429***	0.463***	-0.181	-0.390**	0.0793	0.0360	0.0582	0.123***
	(0.00)	(0.00)	(0.30)	(0.02)	(0.25)	(0.71)	(0.12)	(0.01)
Leverage			-0.120***	-0.0614***	0.0158***	0.0117*	0.0140***	0.0161***
			(0.00)	(0.00)	(0.01)	(0.09)	(0.00)	(0.00)
ROA	-0.485***	-0.515***	0.341***	0.396***	0.0575***	0.0911***	0.00859	0.00221
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.46)	(0.87)
Sales Growth		0.0390***		-0.00738**		0.00499***		0.00682***
		(0.00)		(0.02)		(0.00)		(0.00)
EBIT / Sales		0.0185		-0.0110		-0.00758		-0.00374
		(0.40)		(0.37)		(0.17)		(0.30)
PPE / Sales		-0.00678**		-0.0123***		0.00453***		0.000265
		(0.03)		(0.00)		(0.00)		(0.63)
Quick Ratio		-0.322**		3.184***		-0.191***		-0.145***
		(0.02)		(0.00)		(0.00)		(0.00)
Market Share		0.0315***		0.0101		-0.00341		0.00285
		(0.00)		(0.46)		(0.64)		(0.50)
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster at Firm Level	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14,481	11,517	14,060	11,621	14,593	11,311	12,359	9,601
R-squared	0.163	0.200	0.666	0.769	0.541	0.525	0.246	0.263

Table 5. R&D

This table presents the impact of legalizing share repurchases on a firm's R&D. The dependent variables of interest are *R&D* and *R&D Growth*. The independent variable of interest is *Legalization,* which equals one in the years after market legalized share repurchases and zero otherwise. In columns with an odd number, we control for *Total Assets, Net Sales, Net Income, Leverage* and *ROA*. In columns with an even number, we further control for *Sales Growth, EBIT / Sales, PPE / Sales, Quick Ratio* and *Market Share*. We also control the firm and year fixed effects. The p-values clustered at firm level are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
	R&D		R&D Growth	
Legalization	-0.117**	-0.174**	-4.608***	-5.515***
	(0.03)	(0.02)	(0.00)	(0.00)
Total Assets	-0.172**	-0.632***	0.110	0.0133
	(0.03)	(0.00)	(0.89)	(0.99)
Net Sales	0.0974***	0.565***	0.721**	0.513
	(0.00)	(0.00)	(0.03)	(0.75)
Net Income	-0.0123	-0.0278	0.412	0.293
	(0.45)	(0.21)	(0.35)	(0.64)
Leverage	-0.00213	-0.00192	0.0954***	0.0977**
	(0.61)	(0.73)	(0.00)	(0.03)
ROA	-0.00274	-0.00659	0.200*	0.0275
	(0.73)	(0.46)	(0.09)	(0.86)
Sales Growth		-0.00109***		0.123***
		(0.00)		(0.00)
EBIT / Sales		0.00115		0.101**
		(0.47)		(0.01)
PPE / Sales		0.00111***		-0.00702
		(0.00)		(0.20)
Quick Ratio		-0.0220		-0.408
		(0.24)		(0.38)
Market Share		-0.000371		0.0616
		(0.84)		(0.19)
Constant	Yes	Yes	Yes	Yes
Firm Dummy	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes
Cluster at Firm Level	Yes	Yes	Yes	Yes
Observations	14,352	11,394	14,352	11,394
R-squared	0.802	0.821	0.130	0.139

Table 6. Stock Return

This table presents the impact of legalizing share repurchases on a firm's stock return. The dependent variables of interest are *Buy-and-hold Return* and *Abnormal Stock Return*. The independent variable of interest is *Legalization,* which equals one in the years after market legalized share repurchases and zero otherwise. In columns with an odd number, we control for *Total Assets, Net Sales, Net Income,* and *Leverage*. In columns with an even number, we further control for *Sales Growth, EBIT / Sales, PPE / Sales, Quick Ratio* and *Market Share*. We also control the firm and year fixed effects. The p-values clustered at firm level are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
	Buy-and-hold Return		Abnormal Stock Return	
Legalization	5.859***	7.148***	5.871***	7.154***
	(0.00)	(0.00)	(0.00)	(0.00)
Total Assets	-16.01***	-19.50***	-15.91***	-19.42***
	(0.00)	(0.00)	(0.00)	(0.00)
Net Sales	2.663***	2.601	2.638***	2.622
	(0.00)	(0.26)	(0.00)	(0.26)
Net Income	7.614***	7.780***	7.587***	7.758***
	(0.00)	(0.00)	(0.00)	(0.00)
Leverage	-0.137**	-0.165**	-0.137**	-0.164**
	(0.01)	(0.01)	(0.01)	(0.01)
Sales Growth		0.123***		0.123***
		(0.00)		(0.00)
EBIT / Sales		0.0846		0.0836
		(0.13)		(0.13)
PPE / Sales		0.00346		0.00350
		(0.69)		(0.69)
Quick Ratio		-0.556		-0.545
		(0.34)		(0.35)
Market Share		0.0872		0.0852
		(0.13)		(0.14)
Constant	Yes	Yes	Yes	Yes
Firm Dummy	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes
Cluster at Firm Level	Yes	Yes	Yes	Yes
Observations	13,485	10,837	13,485	10,837
R-squared	0.219	0.240	0.218	0.239

Table 7. Long-run Firm Value

This table presents the impact of legalizing share repurchases on a firm's value in the long run. The dependent variables of interest are *Tobin's Q* and *Market Capitalization (log)*. The independent variables of interest are the interactions between *Legalization* and *K Year After* (share repurchases legalization). We control for *Total Assets, Net Sales, Net Income, Leverage, ROA, Sales Growth, EBIT / Sales, PPE / Sales, Quick Ratio* and *Market Share*, together with the firm fixed effects and year fixed effects. The p-values clustered at firm level are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Tobin's Q					Market Capitalization (log)				
Legalization * One Year After	0.128*					0.112***				
	(0.05)					(0.00)				
Legalization * Two Years After		0.126***					0.126***			
		(0.00)					(0.00)			
Legalization * Three Years After			-0.0555**					-0.0445*		
			(0.03)					(0.05)		
Legalization * Four Years After				-0.0519**					-0.0394*	
				(0.05)					(0.08)	
Legalization * Five Years After					-0.0634**					-0.0751***
					(0.02)					(0.00)
Legalization	-0.328***	-0.324***	-0.291***	-0.293***	-0.294***	-0.321***	-0.320***	-0.289***	-0.291***	-0.289***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Total Assets	-0.115*	-0.114*	-0.113	-0.113	-0.113	0.718***	0.719***	0.720***	0.720***	0.720***
	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Net Sales	0.0644	0.0647	0.0629	0.0635	0.0640	0.0494	0.0496	0.0480	0.0486	0.0492
	(0.28)	(0.28)	(0.29)	(0.29)	(0.28)	(0.39)	(0.38)	(0.40)	(0.39)	(0.39)
Net Income	-0.0691***	-0.0699***	-0.0693***	-0.0693***	-0.0696***	0.137***	0.136***	0.137***	0.137***	0.136***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Leverage	0.00282*	0.00279*	0.00280*	0.00279*	0.00278*	-0.00920***	-0.00922***	-0.00921***	-0.00922***	-0.00923***
	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
ROA	0.0685***	0.0685***	0.0685***	0.0684***	0.0685***	0.0241***	0.0241***	0.0240***	0.0240***	0.0241***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Sales Growth	0.000946***	0.000931***	0.000951***	0.000945***	0.000949***	0.000557***	0.000542***	0.000561***	0.000557***	0.000562***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
EBIT / Sales	0.00168	0.00171	0.00169	0.00170	0.00170	0.000358	0.000392	0.000369	0.000369	0.000377
	(0.16)	(0.15)	(0.16)	(0.16)	(0.16)	(0.72)	(0.69)	(0.71)	(0.71)	(0.70)
PPE / Sales	-0.000377*	-0.000378*	-0.000382*	-0.000379*	-0.000379*	-0.000436**	-0.000437**	-0.000439**	-0.000437**	-0.000438**
	(0.08)	(0.07)	(0.07)	(0.07)	(0.07)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Quick Ratio	0.0108	0.0109	0.0111	0.0111	0.0110	0.0226**	0.0226**	0.0228**	0.0228**	0.0227**
	(0.50)	(0.50)	(0.49)	(0.49)	(0.49)	(0.03)	(0.03)	(0.02)	(0.02)	(0.02)
Market Share	0.000572	0.000581	0.000567	0.000568	0.000571	0.000698	0.000704	0.000692	0.000690	0.000697
	(0.66)	(0.66)	(0.67)	(0.67)	(0.66)	(0.55)	(0.55)	(0.56)	(0.56)	(0.55)
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster at Firm Level	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	11,081	11,081	11,081	11,081	11,081	11,173	11,173	11,173	11,173	11,173
R-squared	0.558	0.558	0.557	0.557	0.557	0.937	0.937	0.937	0.937	0.937

Table 8. Beneficiary Ownership

This table presents the impact of legalizing share repurchases on a firm's beneficiary ownership. The dependent variables of interest are *Change in Shares Number* and *Change in Shares Value*. The independent variable of interest is *Legalization,* which equals one in the years after market legalized share repurchases and zero otherwise. In columns with an odd number, we control for *Total Assets, Net Sales, Net Income, Leverage* and *ROA*. In columns with an even number, we further control for *Sales Growth, EBIT / Sales, PPE / Sales, Quick Ratio* and *Market Share*. We also control the firm and year fixed effects. The p-values clustered at firm level are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
	Change in Shares Number		Change in Shares Value	
Legalization	-3.916***	-3.174*	-7.631***	-4.150**
	(0.00)	(0.07)	(0.00)	(0.02)
Total Assets	0.00621	-1.024	0.205	-0.549
	(0.99)	(0.20)	(0.43)	(0.12)
Net Sales	-0.296*	-0.0635	0.182	0.413
	(0.09)	(0.92)	(0.17)	(0.25)
Net Income	0.294*	0.362*	0.186	0.210
	(0.07)	(0.09)	(0.17)	(0.21)
Leverage	0.00889	0.0329	-0.00269	0.00828
	(0.59)	(0.15)	(0.77)	(0.40)
ROA	-0.0424	-0.0860	-0.0532	-0.0689
	(0.30)	(0.12)	(0.16)	(0.11)
Sales Growth		0.00263		-0.00310
		(0.67)		(0.31)
EBIT / Sales		0.0163		-0.00277
		(0.36)		(0.82)
PPE / Sales		0.00247		0.000890
		(0.37)		(0.45)
Quick Ratio		0.443**		0.172
		(0.04)		(0.12)
Market Share		0.0484**		-0.0274
		(0.04)		(0.12)
Constant	Yes	Yes	Yes	Yes
Firm Dummy	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes
Cluster at Firm Level	Yes	Yes	Yes	Yes
Observations	4,058	3,312	4,058	3,312
R-squared	0.357	0.394	0.412	0.424

Table 9. Legalization and Price/Volume Restriction

This table presents the impact of legalizing share repurchases on firm behavior and firm value, with the interaction between legalization and price/volume restriction. The dependent variables of interest are *Repurchase, Cash, Capital Expenditure, R&D Expense, Buy-and-hold Return,* and *Tobin's Q*. The independent variables of interest are *Legalization * Restriction* and *Legalization,* where *Restriction* equals one if the market has both price restriction and volume restriction on share repurchases, and zero otherwise. *Legalization* equals one in the years after market legalized share repurchases and zero otherwise. We control for *Total Assets, Net Sales, Net Income, Leverage, ROA, Sales Growth, EBIT / Sales, PPE / Sales, Quick Ratio* and *Market Share*, together with the firm fixed effects and year fixed effects. The p-values clustered at firm level are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Repurchase	Cash	Capital Expenditure	R&D Expense	Buy-and-hold Return	Tobin's Q
Legalization * Restriction	-0.120*	2.075**	0.639**	0.224***	-5.035***	0.191***
	(0.05)	(0.01)	(0.02)	(0.01)	(0.01)	(0.00)
Legalization	0.494***	-1.504***	-0.288	-0.198***	7.838***	-0.364***
	(0.00)	(0.01)	(0.30)	(0.00)	(0.00)	(0.00)
Total Assets	-0.209***	1.434**	-0.532**	-0.559***	-15.23***	-0.124*
	(0.00)	(0.02)	(0.03)	(0.00)	(0.00)	(0.07)
Net Sales	0.0844	-1.722***	0.781***	0.549***	1.690	0.106**
	(0.14)	(0.01)	(0.00)	(0.00)	(0.45)	(0.03)
Net Income	0.104***	-0.415***	0.105	-0.0341*	4.913***	-0.0561***
	(0.00)	(0.01)	(0.12)	(0.08)	(0.00)	(0.00)
Leverage	-0.00445***	-0.0489***	0.00732	-0.00618**	-0.110	0.00331**
	(0.01)	(0.00)	(0.25)	(0.03)	(0.11)	(0.04)
ROA	-0.0114	0.378***	0.0710***	-0.0175**	1.045***	0.0667***
	(0.16)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)
Sales Growth	-0.000613*	-0.00424*	0.00400***	-0.000932***	0.127***	0.000791***
	(0.08)	(0.08)	(0.00)	(0.00)	(0.00)	(0.00)
EBIT / Sales	0.00366**	-0.00733	-0.00786	0.00623**	0.00670	0.000206
	(0.05)	(0.59)	(0.14)	(0.01)	(0.90)	(0.91)
PPE / Sales	-0.000104	-0.0111***	0.00460***	0.000825***	0.00652	-0.000170
	(0.61)	(0.00)	(0.00)	(0.00)	(0.46)	(0.32)
Quick Ratio	0.0182	3.741***	-0.121**	-0.0298*	-0.523	0.0274
	(0.20)	(0.00)	(0.02)	(0.08)	(0.43)	(0.19)
Market Share	0.000101	0.0153	-0.0109*	-0.000877	0.0841	0.000812
	(0.94)	(0.23)	(0.07)	(0.60)	(0.14)	(0.46)
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Firm Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Cluster at Firm Level	Yes	Yes	Yes	Yes	Yes	Yes
Observations	9,883	11,335	10,744	11,092	10,802	10,794
R-squared	0.260	0.788	0.571	0.852	0.240	0.620

Table 10. Legalization and Net Tax Rate on Dividend

This table presents the impact of legalizing share repurchases on firm behavior and firm value, with the interaction between legalization and net tax rate on dividend. The dependent variables of interest are *Repurchase, Cash, Capital Expenditure, R&D Expense, Buy-and-hold Return,* and *Tobin's Q*. The independent variables of interest are *Legalization*, *Net Tax Rate on Dividend*, and the interaction term between them. *Legalization* equals one in the years after market legalized share repurchases and zero otherwise. *Net Tax Rate on Dividend* is the effective statutory tax rates on dividend income. We control for *Total Assets, Net Sales, Net Income, Leverage, ROA, Sales Growth, EBIT / Sales, PPE / Sales, Quick Ratio* and *Market Share*, together with the firm fixed effects and year fixed effects. The p-values clustered at firm level are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Repurchase	Cash	Capital Expenditure	R&D Expense	Buy-and-hold Return	Tobin's Q
Legalization * Net Tax Rate on Dividend	0.0125***	-0.0654**	-0.0502**	-0.00621*	0.432***	-0.00107
	(0.00)	(0.01)	(0.02)	(0.07)	(0.00)	(0.61)
Legalization	0.0303	1.252	0.986	0.320**	-22.60***	-0.0876
	(0.87)	(0.27)	(0.18)	(0.02)	(0.00)	(0.33)
Net Tax Rate on Dividend	-0.00801	0.0734***	0.0342	-0.00197	0.00875	-0.00218
	(0.16)	(0.00)	(0.13)	(0.66)	(0.95)	(0.22)
Total Assets	-0.255**	0.214	-1.300***	-0.716***	-14.43***	-0.243**
	(0.02)	(0.75)	(0.00)	(0.00)	(0.00)	(0.04)
Net Sales	0.130	-0.528	1.581***	0.708***	-0.434	0.213**
	(0.26)	(0.49)	(0.00)	(0.00)	(0.89)	(0.02)
Net Income	0.125***	-0.343**	0.165*	-0.0589**	4.630***	-0.0343
	(0.00)	(0.03)	(0.08)	(0.02)	(0.00)	(0.25)
Leverage	-0.00768***	-0.0305	-0.0103	-0.00416	-0.0299	0.00421
	(0.01)	(0.12)	(0.27)	(0.38)	(0.74)	(0.12)
ROA	-0.0159	0.308***	0.0477*	-0.0255***	0.617*	0.0459***
	(0.23)	(0.00)	(0.07)	(0.01)	(0.09)	(0.00)
Sales Growth	-0.00101	-0.00134	0.00186	-0.000262	0.158***	0.00161***
	(0.14)	(0.72)	(0.30)	(0.61)	(0.00)	(0.00)
EBIT / Sales	0.00602	-0.0339***	-0.00313	0.0109**	0.0605	0.00395
	(0.11)	(0.00)	(0.39)	(0.02)	(0.14)	(0.12)
PPE / Sales	-0.000463	-0.00763**	0.00586***	0.00107**	0.00222	-5.95e-05
	(0.21)	(0.01)	(0.01)	(0.02)	(0.83)	(0.82)
Quick Ratio	-0.000363	4.480***	-0.149*	-0.00117	-1.063*	0.0473*
	(0.99)	(0.00)	(0.08)	(0.97)	(0.09)	(0.10)
Market Share	-0.00291	0.0205	-0.0172	-0.00151	0.163	-0.00329***
	(0.36)	(0.27)	(0.11)	(0.53)	(0.15)	(0.01)
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Firm Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Cluster at Firm Level	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,533	5,565	5,285	5,442	5,382	5,320
R-squared	0.285	0.784	0.599	0.858	0.242	0.570

Table 11. Legalization and Financial Constraint

This table presents the impact of legalizing share repurchases on firm behavior and firm value, with the interaction between legalization and financial constraint. The dependent variables of interest are *Repurchase, Cash, Capital Expenditure, R&D Expense, Buy-and-hold Return,* and *Tobin's Q*. The independent variables of interest are *Legalization*, *KZ index*, and the interaction term between them. *Legalization* equals one in the years after market legalized share repurchases and zero otherwise. *KZ index* is a relative measurement of reliance on external financing. We control for *Total Assets, Net Sales, Net Income, Leverage, ROA, Sales Growth, EBIT / Sales, PPE / Sales, Quick Ratio* and *Market Share*, together with the firm fixed effects and year fixed effects. We also control the firm and year fixed effects. The p-values clustered at firm level are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Repurchase	Cash	Capital Expenditure	R&D Expense	Buy-and-hold Return	Tobin's Q
Legalization * KZ Index	-0.0300***	0.307**	0.107**	0.0191**	-1.413**	0.0206**
	(0.01)	(0.01)	(0.01)	(0.04)	(0.02)	(0.01)
Legalization	0.404***	-0.737	-0.0952	-0.114	9.503***	-0.309***
	(0.00)	(0.15)	(0.77)	(0.15)	(0.00)	(0.00)
KZ Index	0.0167	-0.623***	-0.105**	0.00212	3.155***	-0.0341***
	(0.15)	(0.00)	(0.01)	(0.81)	(0.00)	(0.00)
Total Assets	-0.291***	0.996	-0.264	-0.568***	-8.610***	-0.0639
	(0.00)	(0.19)	(0.39)	(0.00)	(0.00)	(0.14)
Net Sales	0.133*	-1.436*	0.395	0.582***	-2.777	0.0573
	(0.06)	(0.08)	(0.19)	(0.00)	(0.30)	(0.12)
Net Income	0.0880***	-0.472***	0.161**	-0.0181	4.700***	-0.0439***
	(0.00)	(0.00)	(0.02)	(0.31)	(0.00)	(0.00)
Leverage	-0.00546**	-0.0337**	0.0170**	-0.0114***	-0.104	0.00265***
	(0.01)	(0.04)	(0.02)	(0.00)	(0.11)	(0.01)
ROA	-0.0105	0.244***	0.112***	-0.0259***	2.064***	0.0635***
	(0.20)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Sales Growth	-0.000635	-0.00602**	0.00386**	-0.000847***	0.136***	0.000714***
	(0.17)	(0.03)	(0.04)	(0.01)	(0.00)	(0.00)
EBIT / Sales	0.00416*	0.0456*	-0.0234***	0.00678**	-0.207*	-0.00229
	(0.07)	(0.07)	(0.01)	(0.01)	(0.07)	(0.19)
PPE / Sales	2.27e-05	-0.0121***	0.00377**	0.000879***	0.00705	-0.000186
	(0.93)	(0.00)	(0.01)	(0.00)	(0.50)	(0.34)
Quick Ratio	0.00107	4.015***	-0.189*	-0.0285	0.728	0.00368
	(0.96)	(0.00)	(0.06)	(0.23)	(0.33)	(0.84)
Market Share	0.00146	0.00619	-0.00736	-9.85e-05	0.128**	0.000433
	(0.34)	(0.66)	(0.32)	(0.96)	(0.02)	(0.76)
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Firm Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Cluster at Firm Level	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8,217	8,927	8,622	8,750	8,858	8,837
R-squared	0.262	0.777	0.588	0.868	0.276	0.678

Table A1. SDC Share Repurchases Cases

To ensure a clear causality identification, we exclude those markets with self-tender repurchases cases before the legalization year. We focus our analyses to the firms buying back shares within two years after the legalization of share repurchases, and hence we also exclude those markets in which the first appearance of share repurchases happened more than two years after the law change. Moreover, we require sufficient financial information available in the Worldscope Database for a given market, such as at least 200 active and inactive companies, and at least five years data before the legalization year. We are left with 17 markets (grey rows).

Country	Law	Legalized Year	First Appearance of Repurchase Case	SDC Deal Number
Australia	First Corporations Law Simplification Bill	1995	1987	21948040
Austria	Safe Harbour Regulation	2003	1994	408038040
Belgium	The Second Council Directive	1984		
Brazil	Brazilian Corporations Law	1976		
Bulgaria	Public Offering of Securities Act	1991		
Canada	Canada Business Corporations Act	1985	1985	97827040
Chile	Chilean Securities Market Law	1981		
China	Administration of Repurchase of Public Shares by Listed Companies Procedures (Trial Implementation)	2005	2005	1672814040
Denmark	Danish Companies Act	2000	1989	119503040
Egypt	Egyptian Companies Law	1992	2008	2014212040
Finland	The Companies Act	1997	1996	551410040
France	The 1998 Law Reform	1998	1988	21915040
Germany	German Stock Corporation Act (Aktiengesetz)	1998	1998	842806040
Greece	The Commission Regulation	2003	2003	1402914040
Hong Kong	Companies (Amendment) Ordinance	1991	1984	156175040
India	SEBI's Buy Back of Securities Regulation	1998	2001	1334996040
Indonesia	The Company Law	1995	2001	1228099040
Ireland	The Irish Companies Acts	1990	1993	394613040
Israel	The Companies Law	1999	1999	942220040
Italy	CONSOB Regulation 11971/1999	1999	1990	178186040
Japan	Commercial Law (1994), Tax Reform Act (1995)	1995	1995	450952040
Jordan	The Securities Law	2002		
Kuwait	Capital Markets Law	2010	2011	2296984040
Malaysia	Malaysian Companies Act	1997	2001	1335964040
Mexico	Mexican Securities Market Law	1996	1993	338718040
Netherlands	Dutch Civil Code	1992	1993	332690040
New Zealand	The Companies Act	1994	1994	447075040
Norway	The Securities Act	1999	1995	467328040
Peru	Peruvian General Corporations Act	1997	2010	2199718040
Poland	Polish Commercial Companies Code	2000	1999	843649040
Russia	Federal Law on Joint Stock Companies (LJSC)	1995	1996	597023040
Singapore	The Companies Act	1998	1999	923168040
South Africa	Listing Requirements	2000	2000	1017165040
South Korea	Securities Act	1994	1996	537334040
Spain	Spanish Company Law	1989	1990	165256040
Sri Lanka	The Companies Act	2007	2015	2806038040
Sweden	Swedish Companies Act	2000	1994	415301040
Switzerland	Swiss Company Law	1992	1993	332310040
Taiwan	Securities and Exchange Act	2000	2002	1278824040
Thailand	The Second Revision of the Public Limited Company Act	2001	1994	430072040
Turkey	The Commercial Law	2009	2010	2256287040
United Kingdom	Companies Act	1981		
United States	SEC Rule 10b-18	1982		
Vietnam	The Corporation and Securities Laws	2000	2010	2151683040

Table A2. Variable Definition

This table presents how we construct the firm-year level sample and the definitions of the dependent, independent, and control variables.

	Sample Construction	
Firm-Year Level Sample	Each firm-year observation contains the firm characteristics and the financial indicators of a firm in a given year. To construct our samples, we first download all observations from Thomson Reuters Worldscope database from 1980 (the base year) to 2017. We filter the dataset by keeping the observations of companies. We first drop the markets with less than 200 active and inactive companies. Next, we exclude Pakistan and Philippines since we cannot find the law related to share repurchase. We also exclude the United States, the United Kingdom, Brazil, Belgium, and Chile, as they legalized share repurchases earlier than 1985. Furthermore, to clearly identify the legalization of share repurchases, we exclude the markets with SDC self-tender repurchases cases before the legalization of share repurchases. Moreover, we focus on the markets with SDC repurchases cases within two years after the share repurchases legalization. After this filtering, we end up with a panel dataset that covers 17 markets, including Canada, China, Germany, Greece, Israel, Japan, Kuwait, Netherlands, New Zealand, Russia, Singapore, South Africa, South Korea, Spain, Switzerland, Taiwan, and Turkey. To obtain a clean identification of the causal effect of share repurchases, we focus on the firms that indeed buyback their own shares within two years after the share repurchases legalization. After this filtering, we end up with a panel dataset with 15,257 observations from 967 firms.	
	Dependent Variables	**Source**
Abnormal Stock Return	Firm-year variable. Abnormal stock return is calculated as (Buy-and-hold Return - Buy-and-hold Return of the Overall Market). Buy-and-hold Return of the Overall Market is the change rate of the market capitalization of all listed firms. Winsorized at level 1% and 99% levels.	Thomson Reuters (Worldscope)
Buy-and-hold Return	Firm-year variable. The change rate of market price (year-end). Year-end Market Price (Worldscope item 05001) represents the closing price of the company's stock on 31 December for U.S. firms. For non-U.S. firms, this item represents the closing price of the company's stock at their fiscal year-end. Winsorized at level 1% and 99% levels.	Thomson Reuters (Worldscope)
Capital Expenditure	Firm-year variable. The ratio of capital expenditure to total assets (in percentage). Calculated as [Capital Expenditure (Worldscope item 04601) / Total Assets (Worldscope item 02999)] * 100. Capital Expenditure (Worldscope item 04601) represents the funds used to acquire fixed assets other than those associated with acquisitions. Total assets (denominator) are adjusted by adding back the share repurchase item. Winsorized at level 1% and 99% levels.	Thomson Reuters (Worldscope)

Cash	Firm-year variable. The ratio of cash to total assets (in percentage). Calculated as [Cash & Short Term Investments (Worldscope item 02001) / Total Assets (Worldscope item 02999)] * 100. Total assets (denominator) are adjusted by adding back the share repurchase item. Winsorized at level 1% and 99% levels.	Thomson Reuters (Worldscope)
Change in Shares Number	Firm-year variable. The change in shares held by individual investors (in percentage). Calculated as [SharesChg / Common Shares Outstanding (Worldscope item 05301)] * 100. SharesChg represents the number of shares changed between the report date and the prior report date. The shares are held by individual investors (OwnTypeCode = 303). Winsorized at level 1% and 99% levels.	Thomson Reuters (Ownership)
Change in Shares Value	Firm-year variable. The change in value of shares held by individual investors (in percentage). Calculated as [ValueChg / Common Shares Outstanding (Worldscope item 05301)] * 100. ValueChg represents the value of the shares changed. The shares are held by individual investors (OwnTypeCode = 303). Winsorized at level 1% and 99% levels.	Thomson Reuters (Ownership)
Debt Issuance	Firm-year variable. Debt issuance is the change in total debt (in percentage). Calculated as [(Current Year's Total Debt - Last Year's Total Debt) / Last Year's Total Assets] * 100. Winsorized at level 1% and 99% levels.	Thomson Reuters (Worldscope)
Dividend	Firm-year variable. The ratio of dividend to total assets (in percentage). Calculated as [Dividends Per Share (Worldscope item 05101) * Common Shares Outstanding (Worldscope item 05301) / Total Assets (Worldscope item 02999)] * 100. Total assets (denominator) are adjusted by adding back the share repurchase item. Winsorized at level 1% and 99% levels.	Thomson Reuters (Worldscope)
Market Capitalization (log)	Firm-year variable. Natural logarithm of [1 + Market Capitalization (U.S.$, Worldscope item 07210)]. Market Capitalization (U.S.$) represents the total market value of the company based on year-end price and number of shares outstanding converted to U.S. dollars using the year end exchange rate.	Thomson Reuters (Worldscope)
Net Assets from Acquisitions	Firm-year variable. The ratio of net assets from acquisitions to total assets (in percentage). Calculated as [Net Assets From Acquisitions (Worldscope item 04355) / Total Assets (Worldscope item 02999)] * 100. Net Assets From Acquisitions (Worldscope item 04355) represent assets acquired through pooling of interests or mergers. Total assets (denominator) are adjusted by adding back the share repurchase item. Winsorized at level 1% and 99% levels.	Thomson Reuters (Worldscope)
R&D Expense	Firm-year variable. The ratio of R&D expense to total assets (in percentage). Calculated as [Research And Development Expense (Worldscope item 01201) / Total Assets (Worldscope item 02999)] * 100. Research And Development Expense (Worldscope item 01201) represent all direct and indirect costs related to the creation and development of new processes, techniques, applications and products with commercial possibilities. Total assets (denominator) are adjusted by adding back the share repurchase item. Winsorized at level 1% and 99% levels.	Thomson Reuters (Worldscope)
R&D Growth	Firm-year variable. Worldscope item 01201. It is the growth rate of firm's R&D expense (in percentage). Calculated as (Current Year's Research And Development Expense / Last Year's Research And Development Expense - 1) * 100. Winsorized at level 1% and 99% levels.	Thomson Reuters (Worldscope)

Repurchase	Firm-year variable. The ratio of share repurchase to total assets (in percentage). Calculated as [Common/Preferred Redeemed, Retired, Converted (Worldscope item 04751) / Total Assets (Worldscope item 02999)] * 100. Common/Preferred Redeemed, Retired, Converted (Worldscope item 04751) represents funds used to decrease the outstanding shares of common and/or preferred stock. Total assets (denominator) are adjusted by adding back the share repurchase item. Winsorized at level 1% and 99% levels.	Thomson Reuters (Worldscope)
Tobin's Q	Firm-year variable. Tobin's Q is calculated as [Market Capitalization (Worldscope item 08001) + Total Liabilities (Worldscope item 03351)] / [Common Equity (Worldscope item 03501) + Total Liabilities (Worldscope item 03351) + Com/Pfd Purchased, Retired, Converted, Redeemed (Worldscope item 04751)]. Compared to the standard computational formula, here we adjust the denominator by adding back the share repurchase item. Winsorized at level 1% and 99% levels.	Thomson Reuters (Worldscope)
Total Payout	Firm-year variable. The ratio of the total payout (sum of dividend and share repurchase) to total assets (in percentage). Calculated as {[Dividends Per Share (Worldscope item 05101) * Common Shares Outstanding (Worldscope item 05301) + Common/Preferred Redeemed, Retired, Converted (Worldscope item 04751)] / Total Assets (Worldscope item 02999)} * 100. Total assets (denominator) are adjusted by adding back the share repurchase item. Winsorized at level 1% and 99% levels.	Thomson Reuters (Worldscope)
Treasury Shares Number	Firm-year variable. The ratio of treasury shares to the number of shares outstanding (in percentage). Calculated as [Treasury Shares (Worldscope item 05303) / Common Shares Outstanding (Worldscope item 05301)] * 100. Treasury Shares (Worldscope item 05303) represent the number of common shares reacquired by the company. Winsorized at level 1% and 99% levels.	Thomson Reuters (Worldscope)
Treasury Shares Value	Firm-year variable. The ratio of treasury stock to the market capitalization (in percentage). Calculated as [Treasury Stock (Worldscope item 03499) / Market Capitalization (Worldscope item 08001)] * 100. Treasury stock represents the acquisition cost of shares held by the company. Winsorized at level 1% and 99% levels.	Thomson Reuters (Worldscope)

	Independent Variables	**Source**
Legalization	Market-year variable. This dummy variable equals one in the years after market legalized share repurchases and zero otherwise.	Manually Collected
Net Tax Rate on Dividend	Market-year variable. Net Tax Rate on Dividend is the effective statutory tax rates on dividend income, taking account of corporate income tax, personal income tax and any type of integration or relief to reduce the effects of double taxation.	OECD Tax Database
KZ Index	Firm-year variable. Kaplan-Zingales index is based on the Kaplan-Zingales (1997) paper on financing constraints. Winsorized at level 5% and 95% levels.	Thomson Reuters (Worldscope)

Restriction	This dummy variable equals one if the market has both price restriction and volume restriction on share repurchases, and zero otherwise. Price restrictions contain all restrictions on the highest price of share repurchases, including but not limited to "Not higher than 5 % above the average price", "Not higher than 10 % above the average price", "Not higher than 15 % above the average price", "Not higher than most recent price", and "Must be purchased at market price". Volume restrictions contain all restrictions on the volume of share repurchases, including but not limited to "Max 5 % of total shares", "Max 10 % of total shares", "Max 20 % of total shares". Legalization * Restriction equals one if there are both price restriction and volume restriction after the legalization, and zero otherwise.	Manually Collected

	Control Variables	**Source**
EBIT / Sales	Firm-year variable. The ratio of earnings before interest and taxes to net sales (in percentage). Calculated as [Earnings Before Interest and Taxes (Worldscope item 18191) / Net Sales (Wolrdscope item 01001)] * 100. Winsorized at level 1% and 99% levels.	Thomson Reuters (Worldscope)
Leverage	Firm-year variable. It is the ratio of total debt to total assets. Calculated as {Total Debt (Worldscope item 03255) / [Total Assets (Worldscope item 02999) + Com/Pfd Purchased, Retired, Converted, Redeemed (Worldscope item 04751)]} * 100. Specifically, here we adjust the denominator (total assets) by adding back the share repurchase item. Winsorized at level 1% and 99% levels.	Thomson Reuters (Worldscope)
Market Share	Firm-year variable. Firm's share of sales by all public firms in the same industry and the same country. Winsorized at level 1% and 99% levels.	Thomson Reuters (Worldscope)
Net Income	Firm-year variable. Natural logarithm of [1 + Raw Net Income (Worldscope item 07250)]. Raw Net Income represents the net income of the company converted to U.S. dollars using the fiscal year-end exchange rate. Obtained from Worldscope (Fundamentals Annual).	Thomson Reuters (Worldscope)
Net Sales	Firm-year variable. Natural logarithm of [1 + Raw Net Sales or Revenues (Worldscope item 07240)]. Raw Net Sales or Revenues represents the net sales or revenues of the company converted to U.S. dollars using the fiscal year-end exchange rate. Obtained from Worldscope (Fundamentals Annual).	Thomson Reuters (Worldscope)
PPE / Sales	Firm-year variable. The ratio of property, plant and equipment to net sales (in percentage). Calculated as [Property, Plant And Equipment (Wolrdscope item 02301) / Net Sales (Wolrdscope item 01001)] * 100. Winsorized at level 1% and 99% levels.	Thomson Reuters (Worldscope)
Quick Ratio	Firm-year variable. Worldscope item 08101. Calculated as (Cash & Equivalents + Receivables (Net)) / Current Liabilities. Winsorized at level 1% and 99% levels.	Thomson Reuters (Worldscope)

ROA	Firm-year variable. Calculated as {Net Income (Worldscope item 01651) / [Total Assets (Worldscope item 02999) + Com/Pfd Purchased, Retired, Converted, Redeemed (Worldscope item 04751)]} * 100. Specifically, here we adjust the denominator (total assets) by adding back the share repurchase item. Winsorized at level 1% and 99% levels.	Thomson Reuters (Worldscope)
Sales Growth	Firm-year variable. Worldscope item 08631. It is the growth rate of firm's net sales (in percentage). Calculated as (Current Year's Net Sales or Revenues / Last Year's Total Net Sales or Revenues - 1) * 100. Winsorized at level 1% and 99% levels.	Thomson Reuters (Worldscope)
Total Assets	Firm-year variable. Natural logarithm of [1 + Raw Total Assets (Worldscope item 07230)]. Raw Total Assets represent the total assets of the company converted to U.S. dollars using the fiscal year-end exchange rate. Obtained from Worldscope (Fundamentals Annual).	Thomson Reuters (Worldscope)

Table A3. Sample Construction and Variable Definition (Market-year Sample)

This table presents how we construct the market-year level sample and the definitions of the dependent, independent, and control variables used in the Weibull hazard model.

	Sample Construction	
Market-Year Level Sample	Each market-year observation contains the market characteristics of a market in a given year together with the year of share repurchases legalization. The macro-level economic development measures such as GDP, GDP per Capita, and Market Cap are obtained from DataBank provided by the World Bank. The market average of financial indicators is constructed from Thomson Reuters Worldscope database. We filter the dataset as what we do for the firm-year level sample. We are left with 163 observations from 17 markets.	
	Dependent Variables	**Source**
Legalization Event	Market-year variable. This dummy variable equals one in the year of share repurchases legalization and zero otherwise.	Manually Collected
	Independent/Control Variables	**Source**
Average Abnormal Stock Return	Market-year variable. The average abnormal stock return of all firms in a market-year. Abnormal Stock Return is described in Table A2.	Thomson Reuters (Worldscope)
Average Buy-and-hold Return	Market-year variable. The average buy-and-hold return of all firms in a market-year. Buy-and-hold Return is described in Table A2.	Thomson Reuters (Worldscope)
Average Capital Expenditure	Market-year variable. The average ratio of capital expenditure to total assets (in percentage) of all firms in a market-year. Capital Expenditure is described in Table A2.	Thomson Reuters (Worldscope)
Average Cash	Market-year variable. The average ratio of cash to total assets (in percentage) of all firms in a market-year. Cash is described in Table A2.	Thomson Reuters (Worldscope)
Average Dividend	Market-year variable. The average ratio of dividend to total assets (in percentage) of all firms in a market-year. Dividend is described in Table A2.	Thomson Reuters (Worldscope)
Average Market Capitalization	Market-year variable. The average market capitalization (log) of all firms in a market-year. Market Capitalization (log) is described in Table A2.	Thomson Reuters (Worldscope)
Average R&D Expense	Market-year variable. The average ratio of R&D expense to total assets (in percentage) of all firms in a market-year. R&D Expense is described in Table A2.	Thomson Reuters (Worldscope)

Average Tobin's Q	Market-year variable. The average Tobin's Q (adjusted) of all firms in a market-year. Tobin's Q (adjusted) is described in Table A2.	Thomson Reuters (Worldscope)
GDP (log)	Natural logarithm of GDP (2010 $, market-year variable). GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in constant 2010 U.S. dollars. Dollar figures for GDP are converted from domestic currencies using 2010 official exchange rates. For a few countries where the official exchange rate does not reflect the rate effectively applied to actual foreign exchange transactions, an alternative conversion factor is used.	World Bank (WDI)
GDP Growth	Annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 2010 U.S. dollars. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources.	World Bank (WDI)
GDP per capita (log)	Natural logarithm of GDP per capita (2010 $, market-year variable). GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in constant 2010 U.S. dollars.	World Bank (WDI)
Inflation	Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. The Laspeyres formula is generally used.	World Bank (WDI)
Market Capitalization / GDP	Market capitalization of listed domestic companies (% of GDP). Market capitalization (also known as market value) is the share price times the number of shares outstanding (including their several classes) for listed domestic companies. Investment funds, unit trusts, and companies whose only business goal is to hold shares of other listed companies are excluded. Data are end of year values.	World Bank (WDI)
Stocks Traded / GDP	Stocks traded, total value (% of GDP). The value of shares traded is the total number of shares traded, both domestic and foreign, multiplied by their respective matching prices. Figures are single counted (only one side of the transaction is considered). Companies admitted to listing and admitted to trading are included in the data. Data are end of year values.	World Bank (WDI)
Stocks Turnover	Stocks traded, turnover ratio of domestic shares (%). Turnover ratio is the value of domestic shares traded divided by their market capitalization. The value is annualized by multiplying the monthly average by 12.	World Bank (WDI)
Tax Revenue / GDP	Tax revenue (% of GDP). Tax revenue refers to compulsory transfers to the central government for public purposes. Certain compulsory transfers such as fines, penalties, and most social security contributions are excluded. Refunds and corrections of erroneously collected tax revenue are treated as negative revenue.	World Bank (WDI)

Table A4. Summary Statistics (Weibull Model)

	Obs	Mean	Std. Dev	25%	Median	75%
Dependent Variables						
Legalization Event	163	0.07	0.25	0	0	0
Independent Variables						
Average Abnormal Stock Return	126	18.32	36.85	-4.00	11.24	32.31
Average Buy-and-hold Return	134	19.35	37.97	-3.46	12.59	37.49
Average Capital Expenditure	139	7.46	3.14	5.84	7.00	8.59
Average Cash	139	16.28	10.90	8.48	12.70	22.87
Average Dividend	139	1.55	1.24	0.86	1.25	1.85
Average Market Capitalization	138	19.71	0.94	19.20	19.72	20.42
Average R&D Expense	139	1.02	1.14	0.06	0.57	1.88
Average Tobin's Q	138	1.60	0.96	1.15	1.40	1.65
GDP (log)	163	26.53	1.39	25.37	26.27	27.00
GDP Growth	163	4.37	4.44	1.61	3.66	7.10
GDP per capita (log)	161	9.88	0.77	9.18	10.15	10.43
Inflation	163	16.02	44.13	2.07	4.02	10.44
Market Capitalization / GDP	163	62.83	49.48	24.62	47.04	87.75
Stocks Traded / GDP	163	31.98	39.81	7.37	18.05	37.93
Stocks Turnover	163	63.08	65.01	21.89	40.72	78.30
Tax Revenue / GDP	163	16.46	8.40	10.87	14.81	21.90

Table A5. Timing of Legalization Laws: Weibull Hazard Model

This table estimates a Weibull hazard model in which the "failure event" is the adoption of share repurchase legalization laws in a given country. The sample consists of 17 countries during our sample period. Countries are dropped from the sample once they have adopted share repurchase legalization laws. The dependent variable is *Legalization Event*, which equals one in the year of the legalization of share repurchases and zero otherwise. The independent variables of interest are *Average Tobin's Q*, *Average Market Capitalization*, *Average Buy-and-hold Return*, *Average Abnormal Stock Return*, *Average Dividend*, *Average Cash*, *Average Capital Expenditure*, and *Average R&D*, which are the averages of all firms in a market-year. All independent variables are at the market-year level. We control for *GDP (log)*, *GDP per capita (log)*, *GDP Growth*, *Stocks Turnover*, *Stocks Traded / GDP*, *Market Capitalization / GDP*, *Tax Revenue / GDP*, and *Inflation*. Variable definitions are provided in Table A4. The p-values clustered at country level are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Legalization Event							
Average Tobin's Q	0.424							
	(0.46)							
Average Market Capitalization		-0.916						
		(0.55)						
Average Buy-and-hold Return			-0.00513					
			(0.51)					
Average Abnormal Stock Return				-0.00514				
				(0.55)				
Average Dividend					-0.773			
					(0.39)			
Average Cash						0.0286		
						(0.73)		
Average Capital Expenditure							-0.375	
							(0.32)	
Average R&D Expense								0.365
								(0.21)
GDP (log)	0.696*	1.157	0.760**	0.741*	0.585	0.682*	0.694**	0.665
	(0.09)	(0.18)	(0.05)	(0.05)	(0.22)	(0.06)	(0.04)	(0.10)
GDP per capita (log)	0.768*	0.873	0.394	0.430	0.556	0.748	0.290	0.603*
	(0.08)	(0.14)	(0.40)	(0.40)	(0.20)	(0.33)	(0.34)	(0.07)
GDP Growth	-0.0279	-0.0198	-0.0189	-0.0175	0.0251	0.00505	0.0379	-0.0178
	(0.87)	(0.91)	(0.90)	(0.91)	(0.86)	(0.97)	(0.77)	(0.90)
Stocks Turnover	-0.00765	-0.0135	-0.0120	-0.0104	-0.00881	-0.00437	-0.00586	-0.00721
	(0.54)	(0.44)	(0.43)	(0.56)	(0.59)	(0.77)	(0.67)	(0.56)
Stocks Traded / GDP	0.0119	0.0227	0.0251	0.0216	0.0145	0.0113	0.0256	0.0132
	(0.56)	(0.20)	(0.31)	(0.52)	(0.15)	(0.54)	(0.15)	(0.45)
Market Capitalization / GDP	0.00407	0.00727	-0.00254	-0.000877	0.00335	0.00362	-0.00576	0.00751
	(0.71)	(0.66)	(0.86)	(0.96)	(0.75)	(0.80)	(0.36)	(0.54)
Tax Revenue / GDP	0.186	0.145	0.177	0.175	0.179	0.215	0.232	0.187
	(0.21)	(0.45)	(0.25)	(0.25)	(0.31)	(0.26)	(0.23)	(0.22)
Inflation	-0.445	-0.421	-0.404	-0.409	-0.567	-0.480	-0.584	-0.495
	(0.19)	(0.28)	(0.21)	(0.19)	(0.13)	(0.22)	(0.19)	(0.20)
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster at Country Level	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	138	138	134	126	139	139	139	139

Table A6. Treasury Shares

This table presents the impact of legalizing share repurchases on a firm's treasury shares. The dependent variables of interest are *Treasury Shares Number* and *Treasure Shares Value*. The independent variable of interest is *Legalization,* which equals one in the years after market legalized share repurchases and zero otherwise. In columns with an odd number, we control for *Total Assets, Net Sales, Net Income, Leverage* and *ROA*. In columns with an even number, we further control for *Sales Growth, EBIT / Sales, PPE / Sales, Quick Ratio* and *Market Share*. We also control the firm and year fixed effects. The p-values clustered at firm level are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
	Treasury Shares Number		Treasury Shares Value	
Legalization	0.756***	0.823***	1.070***	0.830***
	(0.00)	(0.00)	(0.00)	(0.00)
Total Assets	0.0405	0.0719	-0.0592	0.266
	(0.79)	(0.77)	(0.72)	(0.34)
Net Sales	0.0255	-0.191	0.0491	-0.302
	(0.57)	(0.43)	(0.28)	(0.17)
Net Income	0.0137	0.0797	-0.305***	-0.306***
	(0.84)	(0.28)	(0.00)	(0.00)
Leverage	-0.00448	-0.00572	0.00823	0.00554
	(0.49)	(0.46)	(0.24)	(0.52)
ROA	-0.0314	-0.0376*	-0.0401**	-0.0267
	(0.11)	(0.09)	(0.04)	(0.22)
Sales Growth		0.000322		-0.000941
		(0.77)		(0.39)
EBIT / Sales		-0.00502**		-0.00715**
		(0.03)		(0.01)
PPE / Sales		-0.000948		-0.00125
		(0.20)		(0.13)
Quick Ratio		0.0101		-0.0181
		(0.82)		(0.72)
Market Share		-1.63e-05		0.00299
		(1.00)		(0.68)
Constant	Yes	Yes	Yes	Yes
Firm Dummy	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes
Cluster at Firm Level	Yes	Yes	Yes	Yes
Observations	10,640	8,351	10,640	8,351
R-squared	0.559	0.578	0.506	0.511

Table A7. Price and Volume Restrictions of Share Repurchases After Legalization

Country	Authority	Price Restriction	Volume Restriction
Canada	TSX (Toronto Stock Exchange)	Not higher than most recent price	Max 5 % of total shares
China	CSRC (China Securities Regulatory Commission)	Not higher than 5 % above the average price (of the previous trading 30 days)	-
Germany	BaFin (Financial Supervisory Authority)	The minimum and maximum repurchase price must also be specified before authorization	Max 10 % of total shares
Greece	ATHEX (Athens Stock Exchange)	No higher than most recent price	Max 10 % of total shares, 25% of average daily volume
Israel	ISA (Israeli Securities Authority)	According to the market price	Max 25% of average daily volume
Japan	TSE (Tokyo Stock Exchange)	Not higher than last day price	Max 25% of daily volume (of the previous month)
Kuwait	CMA (Capital Markets Authority)	-	-
Netherlands	AFM (Netherlands Authority for the Financial Markets)	-	Max 10 % of total shares
New Zealand	NZX (New Zealand Stock Exchange)	-	-
Russia	MOEX (Moscow Exchange)	Repurchased shares must be reissued at a price not lower than the market value within one year of their repurchase	Max 10 % of total shares
Singapore	SGX (Singapore Exchange)	Not higher than 5 % above the average price (of the previous trading 5 days)	Max 10 % of total shares
South Africa	JSE (Johannesburg Stock Exchange)	-	Max 10 % of total shares
South Korea	KRX (Korea Exchange)	Not higher than 5 % above the average price (of the previous trading 5 days)	Max 25% of average daily volume
Spain	BME (Bolsa de Madrid)	-	Max 5 % of total shares
Switzerland	SFBC (Swiss Federal Banking Commission)	-	Max 10 % of total shares
Taiwan	FSC (Financial Supervisory Commission, Taiwan)	-	Max 10 % of total shares
Turkey	BIST (Borsa Istanbul)	Max and minimum price limits calculated with 10% margin on the determined price in the valuation report	Max 10 % of total shares