Do antitrust laws erode shareholder return? Evidence from the Chinese market

Abstract

Using data on 4,784 completed mergers and acquisitions in China announced between 2002 and 2016, we find that the shareholder returns on horizontal acquisitions are substantially reduced by the adoption of the Chinese Anti-Monopoly Law. Based on our findings for reduced post-merger sales and returns, we argue that a loss of market power drives this negative relationship. We also find that the acquiring firms' cost efficiency does not change significantly as a result of the combination, suggesting that the decline in shareholders' wealth after horizontal mergers is not a result of reduced cost efficiency. Furthermore, we conduct a series of robustness checks to examine how the adoption of antitrust law decreases the wealth of producing firms' shareholders. Overall, our results indicate that a stricter guideline of the antitrust policies must be made by the government in order to protect consumer welfare.

Keywords: antitrust law; merger control; horizontal M&A; market power
JEL classification: G14; G34

INTRODUCTION

Modern-day antitrust laws aim to ensure free competition in the market. Governmental measures to protect consumers from predatory business activities and promote fair competition are well established in Western economies, with the earliest contemporary anti-monopoly law (AML), the Sherman Antitrust Act, dating back to the late 19th century. There is a voluminous body of literature that gauges the impact of a reform in business combination regulations that engenders both price and non-price effects on consumer welfare, especially in the European setting (see for example, Duso et al., 2004). In developing countries, however, competition laws were adopted much later, perhaps in accordance with their transitions from centrally planned economies to market economies. For instance, in the Asia-Pacific region, competition laws have been adopted fairly recently.[1] Consequently, few studies have gauged the impact of antitrust laws on corporate merger policies and post-merger firm performance in Asian markets.

The sheer size and prominence of the Chinese market make an examination important and interesting as to whether competition laws serve their intended purpose. Similar to its Southeast Asian neighbors, China began efforts to enact comprehensive business combination regulations to consolidate its antitrust provisions into a uniform set of rules only in the 2000s. China passed its first comprehensive AML on August 30, 2007, and has regulated a competitive market ever since.[2] The AML entered in force on August 1, 2008, and it includes provisions found in most other countries' antitrust laws, such as the prohibition of anti-competitive business practices and agreements, the abuse of market power, and pre-merger notification and review requirements. China's AML also contains many provisions that regulate state-owned enterprises (SOEs) in important economic sectors, trade associations, and monopolies created by government agencies. With regard to merger guidelines, the AML draws a clear distinction between competition-harmful and competition-harmless mergers and acquisitions based on how a merger agreement should be viewed as

an attempt to form consolidation.[3] Specifically, it is stated in Article 3 of Chapter 1 and in Articles 20 through 31 of Chapter 4 that any business activities (including mergers) that contribute to gaining excessive market concentration or that abuse-dominant market position will be subject to investigation and appropriate measures will be taken to mitigate these business activities. In addition, Article 8 of the State Administration for Industry and Commerce (SAIC)'s "Regulation on the Prohibition on the Abuse of Dominant Market Position" states that certain practices may be justified when there is a valid reason for doing so. The examples of these exceptions included, but were not limited to trade practices, public interest, and economic circumstances. Specifically, the Article 15 of the law grants exemption for "monopoly agreements" that improve cost- and operational-efficiencies, given that the business practice does not severely restrict competition in the relevant market and that the resulting benefits are also shared by consumers. However, these exemption criteria are mostly concerned with the abuse of dominant market position (*e.g.*, anti-competitive pricing policies) and they are not explicitly mentioned in articles that regulate anti-competitive mergers. No clearance was given based on this exemption justification out of approximately 2000 total transactions reviewed up to 2018, whereas behavioral remedies (*e.g.*, maintain or expand production/investment in China) or structural remedies (*e.g.*, business divestiture) were often imposed to address horizontal concentration issues for 38 cases, hinting that non-competition considerations and efficiency defense are highly unlikely.[4]

The Chinese government has been seeking to cease direct intervention in firms over the past 40 years. During this time, foreign financial funds began flooding into the Chinese market, leading to countless joint ventures and multinational corporations. However, the government still holds major ownership stakes in industry-leading giants (Child & Tse, 2001).[5] China's governing bodies appear currently to be taking a strong stance against foreign and multinational companies penetrating the market, while permitting domestic firms in strategically important industries (e.g., internet, electricity, telecommunications, petroleum, finance, insurance, water and electricity, and tobacco) to complete anti-competitive mergers (Svetlicinii, 2022).[6] The current regime seems to be more focused on curbing monopolistic pricing agreements by domestic firms than on reducing market concentration.[7] However, anti-competitive combinations of domestic companies may reduce consumer welfare more than anti-competitive acts of both domestic and foreign companies.[8] China's transition to a market economy via privatization is still in progress, giving rise to a unique business environment characterized by weak investor protection and high uncertainty.

Due to the complex nature of the Chinese market, it presents a unique setting for researchers to check whether the Western-based (mostly US-based) understanding of markets can be used to better explain transitioning economies and emerging markets. Studies have yielded contradictory results on long-run post-merger returns, as it is empirically difficult to isolate mergers' effects on stock price performance. In addition, we do not have sufficient data to examine the long-term effects of these changes in China's regulatory environment because the AML was introduced fairly recently. Hence, we attempt to identify the relationship between the AML's enactment and firms' post-merger returns and performance in the short term. Specifically, we analyze changes in Chinese firms' mergers and acquisitions (M&A) policies and post-merger business

activities, proxied by post-merger sales and direct and indirect costs, and changes in their post-merger performance, measured by cumulative returns around merger announcement dates, after the AML's enactment, to check whether the AML contributes to free competition in the market. We limit our focus to horizontal rather than vertical M&A deals based on the premise that newly-combined business entities created by the horizontal combination of two competitors reduce consumer welfare more than those formed by the vertical integration of firms from different industries. Vertical mergers may make it difficult for rival firms to form partnerships with distribution and component-producing firms, possibly reducing their cost efficiency. As a result, consumers may be forced to pay a premium when purchasing rival firms' products. However, they can also seek alternative products that are largely unaffected by vertical M&As within an industry. In contrast, horizontal mergers may be more directly detrimental to consumer welfare in that the business entities combined by such deals typically acquire higher market concentration and thus command disproportionate market power. These firms can expropriate consumers by raising prices, lowering product or service quality, reducing the availability of alternative goods, and so forth. In this type of market structure that can be highly concentrated, the present discounted value of total welfare can be interpreted as a decreasing function of the number of firms (Karp, 1992).

Our empirical analyses consider 4,784 completed merger deals in China from 2002 to 2016 after a series of data screening processes. We employ the empirical design proposed by Chhaochharia and Grinstein (2009) and Fauver, Hung, Li, and Taboada (2017) to measure acquirers' gains or losses from horizontal mergers after the enactment of the AML. Our results are broadly consistent with the market power hypothesis, which suggests that the introduction of a market-wide regulation of anticompetitive corporate activities facilitates the transfer of resources from producers to consumers. We also find that the AML reduces acquirers' post-merger returns, indicating that managers' incentives to engage in value-decreasing mergers have increased. However, acquirers' post-merger cost efficiency does not vary significantly following enactment of the AML, suggesting that acquiring firms can recoup their losses from reduced market power (i.e., less price collusion) and increased agency costs (i.e., suboptimal target selection) by improving their cost behavior. These results provide valuable implications for developing markets that are yet to pass universal antitrust regulations, as our results using data from China are in line with the findings of studies of developed markets.

The remainder of this paper is organized as follows. Section 2 briefly reviews the literature and develops our main hypotheses. Section 3 describes the sample construction process and methodology. Section 4 describes the empirical analyses, and Section 5 concludes the paper.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

The literature provides mixed evidence on the effects of changes in combination regulations on acquiring firms' horizontal merger performance. The market power hypothesis suggests that increasing restrictions on corporate M&A activities may help reduce acquiring firms' undue profits from engaging in anti-competitive mergers (Robinson, 1969; Stigler, 1964). Both Robinson (1969) and Stigler (1964) suggest that the enactment of a stringent antitrust law regulating firms' collusive

pricing activities may enhance consumer surplus and ultimately help boost overall social welfare. According to Liu and Qiao (2012), the Chinese judiciary has partially succeeded in limiting Chinese enterprises' anticompetitive pricing activities and the exploitation of market power. Given this context, we expect to observe a decline in acquiring firms' post-merger returns, as measured by the firms' five-day cumulative abnormal returns (CARs) around merger announcement dates. We also capture the size of each completed deal to identify any irregular patterns in acquiring firms' target selections due to the enforcement of new merger guidelines.

In contrast, the cost efficiency hypothesis suggests that the enforcement of antitrust law based on deal size ignores the possibility that gains from horizontal mergers may stem from improved productivity and purchasing efficiency rather than from competition-harming collusion (Eckbo, 1992; Eckbo & Wier, 1985; Fee & Thomas, 2004). Similarly, Maksimovic, Phillips, and Prabhala (2011) suggest that horizontal M&A benefits both participants by enhancing post-merger firm productivity and post-merger cost efficiency via firm restructuring. Hoberg and Phillips (2010) also corroborate the notion that the increase in post-merger firm productivity is a form of synergetic gain from horizontal M&As. Given China's context, it seems reasonable to assume that enterprises engaged in anti-competitive mergers prior to the adoption of the AML, transferring wealth from consumers to the acquiring firms' shareholders. Although the effectiveness and implementation of the AML may be controversial, it was the first carefully devised comprehensive antitrust regulation to be drafted and amended to reform competition policies after more than a decade (Owen, Sun, & Zheng, 2008). At a minimum, we expect firms headquartered in China to be required to follow the merger guidelines provided by the government, meaning that they cannot strike merger deals that would limit industry competition. Consequently, we predict that acquiring firms earn lower merger announcement returns than they would earn if the AML was not enforced.

Likewise, we examine whether the AML engenders significant changes in acquirers' post-merger firm performance and cost behavior, which we proxy using firms' post-merger sales revenues and their post-merger costs of goods sold and selling, general, and administrative expenses, respectively. Contrary to our earlier prediction, which is consistent with the market power hypothesis, prior studies report that competing firms engage in horizontal mergers not to consolidate market power and expropriate consumers, but rather to improve firm productivity and purchasing efficiency (Dewey, 1961; Manne, 1965). More recent studies corroborate the cost efficiency motives for horizontal M&As (Eckbo, 1992; Eckbo & Wier, 1985; Fee & Thomas, 2004). In this case, acquirers can improve their cost efficiency by engaging in horizontal mergers, regardless of the introduction of the AML.

There is a vast literature that focuses on the motives and consequences of mergers and acquisitions other than the market power and cost efficiency hypothesis (see for example, Belleflamme & Peitz, 2015). For instance, firms might consider acquisition of targets with high research and development (R&D) expenses and limited growth opportunities as a means of enhancing innovation (Phillips & Zhdanov, 2013; Bena & Li, 2014). Firms might also consider engaging in cross-border mergers and acquisitions to look for a bargain sale opportunity not present within their national borders thereby paving a way to penetrate into a new market for growth (Gonzalez et

al., 1998; Shimizu et al., 2004; Rossi & Volpin, 2004). Prior studies also look Given these motives for mergers and acquisitions, acquiring firms are expected to increase R&D spending to maintain a competitive edge in the industry and to seek growth opportunities outside the borders based on the premise that these attempts are not deemed to be anti-competitive by the regulatory authorities.

Notably, however, the enactment of the AML is likely to increase managerial incentives to engage in value-decreasing mergers, thereby mitigating hostile takeover threats, possibly leading to an increase in the overall agency costs incurred by all Chinese enterprises. It is widely accepted that managers are tempted to alter corporate policies to receive private benefits at the expense of organizational efficiency, especially if proper governance mechanisms or strong incentive systems are lacking (Fama & Jensen, 1983; Jensen, 1986; Jensen & Meckling, 1976). Recent studies also show that managers may be more likely to engage in agency-motivated, value-decreasing acquisitions when antitrust laws are in effect, as such laws offer protective measures against hostile and cross-border takeover attempts (e.g., Dissanaike, Drobetz, & Momtaz, 2020; Frattaroli, 2020). In addition, individualistic, self-serving Chinese managers are willing to take more risks to pursue profits than managers from previous generations and from other countries (Ralston, Egri, Stewart, Terpstra, & Kaicheng, 1999). Aktas, de Bodt, Bollaert, and Roll (2016) also note that a manager's personal characteristics may result in suboptimal M&A target selection and that acquirers' CARs are negatively correlated with their incumbent CEOs' self-centeredness. Numerous studies show that such managerial self-interest may prevail when firms are highly profitable (i.e., hold access to free cash), close to being market leaders (i.e., face mediocre product market competition), and unlikely to become targets of hostile takeovers (Giroud & Muller, 2011; Harford, Humphery-Jenner, & Powell, 2012; Masulis, Wang, & Xie, 2007; Shleifer & Vishny, 1997).

It is reasonable to assume that rational managers are unlikely to pursue their own interests when their careers are at risk of damage from external threats, such as hostile takeover attempts and intense product market competition. Given the distinctive characteristics of the Chinese market, we must acknowledge that AML enforcement may not suffice to curb managers' empire-building motives to engage in value-decreasing horizontal mergers. To some degree, suboptimal target selection due to new merger guidelines may be considered more harmful to social welfare than monopolistic pricing. The transfer of resources from producer to consumer surplus, reflected by the reduction in acquiring firms' shareholder value, may be completely offset or even outweighed by the increase in firms' organizational inefficiencies, reflected in the increase in agency costs. Based on the premise of increased agency costs and lower market concentration due to AML enforcement, we expect acquirers' post-merger sales and merger announcement returns to decline following the law's enactment (Gugler et al., 2003).[9] Simultaneously, we predict that newly combined firms can recoup their losses from reduced market power and increased agency costs by improving their cost efficiency. Hence, we propose the following hypotheses:

Hypothesis 1: Acquirers in horizontal mergers earn lower (higher) CARs around merger announcements after (before) the adoption of AML.

Hypothesis 2: Acquirers in horizontal mergers have lower (higher) post-merger sales and worse (better) cost efficiency after (before) the adoption of AML.

SAMPLE AND DATA

Data source and sample construction

Our sample of horizontal mergers comes from the Securities Data Company's (SDC) M&A database. The sample period spans from 2002 to 2016, starting and ending roughly six years before and after the enactment of China's AML, to properly capture the effects of the reform. In this analysis, we limit our sample to completed deals whose acquirers are Chinese firms outside of the financial and utilities sectors that own fewer than half of their target's shares before the announcement but hold all of its shares after the merger. We do not place restrictions on the target firms' countries. We exclude petty deals (less than one million US dollars) from our sample, as they may be associated with recapitalization or restructuring plans. We obtain accounting information from Compustat Global and exclude observations with missing firm- or deal-level characteristics. In addition, the acquirer's national code in the SDC must match that in Compustat. We define a horizontal merger as a merger in which the acquirer and target firms have the same standard industrial classification (SIC) codes. We winsorize all firm- and deal-level variables at the top and bottom 1%. After the screening process, our final sample included 4,784 completed deals for the period from 2002 to 2016.

Control variables

Unless otherwise stated, our regression models include an extensive set of control variables to mitigate selection bias concerns. These variables include both firm- and deal-level characteristics, which previous studies find to be influential in corporate merger decisions. To control for firm-level characteristics, we first include the natural logarithms of the acquiring firm's size, growth opportunities, and asset tangibility scaled by book assets. All these variables are widely accepted as essential aspects of a firm's fundamental financial health. Next, we include the acquiring firm's leverage and cash holdings, as cash-rich firms with low leverage ratios tend to engage in value-decreasing mergers (Jensen, 1986). To choose deal-level control variables, we consider factors that may affect merger outcomes, including the deal's relative size and various indicator variables identifying the type of deal (i.e., public or private and tender or merger) and the method of payment (i.e., cash, equity, or debt). We also choose deal-level control variables based on the findings of previous studies. Specifically, Moeller, Schlingemann, and Stulz (2005) show that the acquiring firm's merger performance is lower when the completed deal is larger. In addition, Myers and Majluf (1984) argue that a firm's choice of payment for a merger (cash or stock) indicates the level of information asymmetry around the deal and, thus, affects the acquirer's announcement returns in disparate ways. Among deal types, tender deals have more leeway to serve non-financial purposes than do ordinary merger deals. Fuller, Netter, and Stegemoller (2002) also note that a liquidity discount increases bidding shareholders' gains when purchasing a private target.

Methodology

The main regression, inspired by Chhaochharia and Grinstein (2009) and Fauver et al. (2017), is as follows:

$$CAR(-2,+2)_{it} = \alpha + \beta_1 After_t * Horizontal_i + \beta_2 Horizontal_i + \theta Controls_{it} + Year_t + Industry_k + \epsilon_{it}, \quad (1)$$

where i is the firm, t specifies the year, and k denotes the three-digit SIC code. For the dependent variable, $\mathrm{CAR}(-2,+2)$, we estimate the acquirer's gain or loss in an M&A deal by calculating its CARs within two calendar days of the merger announcement date. After is a binary variable that equals 1 for M&A deals completed after the AML's enactment. Horizontal is an indicator variable equal to 1 if both the acquirer and the target of a deal have the same three-digit SIC code (Alfaro & Charlton, 2009). All the control variables mentioned in the previous section are included to mitigate the effects of confounding variables on merger outcomes. Industry and year fixed effects are also incorporated in our model to control for time-variant economic conditions within our sample period and time-invariant differences across industries, respectively. To account for correlations across M&A outcomes within the same industry, we cluster standard errors at the industry level, unless otherwise stated.

To capture the effects of the AML on combined firms' performance, we use a model similar to equation (1) with slight modifications to the set of dependent variables. Specifically, we replace $\mathrm{CAR}(-2,+2)_{it}$ with $\mathrm{Log(DealValue)}_{it}$ to estimate the effects of the AML's enactment on deal size. Similarly, we use $\mathrm{Log(COGS)}_{t+j}$, and $\mathrm{Log(SGA)}_{t+j}$, both scaled by acquiring firms' sales in the respective years, to measure the changes in the direct and indirect selling expenses of the enterprises associated with the change in China's business combination regulations, respectively. Because it is highly unlikely that these accounting variables changed immediately following the enforcement of the AML, we consider a time window of three years. Thus, the subscript j ranges from 1 to 3.

EMPIRICAL ANALYSIS

Sample characteristics

Before discussing the descriptive statistics of our data, we first compare the number of completed M&A deals decomposed by year with those for the global, non-US, and non-China regions. To examine yearly patterns, we drew scatter plots to show general trends in acquisition activities in China and those in non-US and non-China regions. It is clear from Figure 1 that far fewer than 100 M&A deals in China are reported in 2002, 2005, and 2006.[10] Only about 15.3% of the deals in China are conducted in the years 2002-2008, out of a total of 4,784 deals over the full sample period (2002-2016). Contrariwise, global acquisitions around the same time span represent approximately 45.8% of the total 17,978 deals. This suggests that the merger market in China was less active prior to 2008, during which both the Great Recession and the enactment of AML coincided, than the global merger market, excluding the US.

[Figure 1]

[Figure 2]

It is clear that M&A activities in China are quite distinctive compared to those in non-China areas. Acquisitions in China display an increasing pattern, whereas those in non-US and non-China regions show a decreasing pattern during the sample period. The above figures prompt two interesting observations. First, global M&A deals (excluding the US and China) shrink to about two-thirds in 2008 and to about 55% in 2009, both compared to M&A activities in 2007, suggesting that the global M&A market (excluding the US and China) was hard hit by the Great Recession in 2008 and has not fully recovered from it to reach its all-time high in 2007. Second, M&A deals in China consistently increase over the sampling period (2002-2016). The overall increasing trend shows that M&A activities in China were largely unaffected by the Great Recession.[11] These observations show that the M&A market in China is expanding in qualitatively different way from other countries, owing to its delicate governance structure (SOEs), informational transparency, and political uncertainties (a communist regime).

Summary statistics

[Table 1]

Table 1 shows the summary statistics for the main variables used in our study over the sample period from 2002 to 2016. We identify 4,784 completed merger deals whose acquiring firms are headquartered in China over the sample period. Approximately 84.7% of the deals are completed in or after 2009, implying that the enactment of the AML is likely to have spurred merger activities among Chinese firms, although we cannot draw any meaningful conclusions based solely on this finding. Horizontal mergers constitute about 11.4% of the sample, about 0.1% of mergers are tender offers, and 0.5% have a public firm as a target. Given that our study aims to determine the impact of AML on horizontal acquisitions between two private firms, this result indicates that our sample is appropriate for further analysis. We take the natural logarithm of cost of goods sold (COGS) and selling, general, and administrative cost (SGA), which are both scaled by the sales in the same year. About 22.2% of the completed deals use pure cash payments and 10% use pure stock payments, implying that the remaining 67.8% of the deals are financed with a mixture of cash, stock, and debt. The five-day CARs had a mean of 0.031 and a standard deviation of 0.097, indicating sufficient variation in our sample. Next, we review the firm-level characteristics. In our sample, an average acquirer holds about 20.3% of its total assets in debt, 18.3% in cash, and 29.3% in tangible assets. We find that the return on assets has a mean of 3.7% and a Tobin's Q of 3.048 for our sample firms.

Baseline results

[Table 2]

Table 2 reports the results of estimating equation (1). Specifically, we investigate whether the promulgation of China's AML prompts notable changes in acquiring firms' post-merger returns, which is our dependent variable, five-day CARs. Columns (1) and (2) show the effects of the AML on acquirers' merger announcement returns. Column (1) reports the estimation results when we exclude the control variables from equation (1), and column (2) reports the results when the full set of variables shown in equation (1) is included.

The first row of column (1) shows that the regression coefficient of After*Horizontal is -0.0308, which is statistically significant at the 1% level. Similarly, column (2) reports that the coefficient of After*Horizontal is -0.0243, which is statistically significant at the 5% level. These results indicate that acquiring firms' merger announcement returns fell by approximately 2% owing to the entry in force of the AML. This downward pressure on acquirers' five-day CARs around merger announcements is consistent with our hypothesis that stringent antitrust measures governing M&As lead to lower merger performance in line with the market hypothesis, which posits that the enforcement of antitrust regulations may help reduce acquiring firms' undue profits from engaging in anticompetitive mergers (Robinson, 1969; Stigler, 1964). Likewise, our results partially support the agency hypothesis, which argues that managers may be more likely to engage in agency-motivated, value-decreasing acquisitions when antitrust laws are enforced, as such laws offer protective measures against hostile and cross-border takeover attempts, both of which may reduce overall competition in the domestic market (Dissanaike et al., 2020; Frattaroli, 2020). However, it is also likely that managers may have been serving shareholders' best interests and that the enactment of AML spurred negative market sentiment toward M&As, which is reflected by the negative CARs. In this regard, managers do not make value-destroying acquisitions, but simply do not earn the same level of returns as in the pre-AML period. In column (2), the coefficient for Horizontal is positive and the t-statistics is 1.56 which is slightly shy of making the 10% statistical significance threshold, suggesting that the acquirer's post-merger performance does not depend on whether a merger deal is horizontal or vertical when we incorporate all the control variables to minimize confounding errors. We may interpret the positive coefficient as being roughly consistent with the market power hypothesis, because if a company engages in a horizontal acquisition whose influence on the market competition is not actively monitored and restrained by the regulatory agency, then the investors would welcome such news, since the benefits of becoming a shareholder of a market-leader should be strictly better than the benefits of becoming a shareholder of a market-follower. The adjusted R-squared for column (2) is about 0.099 which indicates a better fit than the regression model used for column (1).[12]

Potential channels

[Table 3]

In addition, we examine the potential channels through which decreasing post-merger announcement returns are manifested. Earlier studies suggest that monopolistic firms may earn anti-competitive rents without the intervention of antitrust regulations. If this assumption holds, then the AML should be able to exert sufficient control over firms' target selection and post-merger business activities. More precisely, we should be able to identify a change in the sizes of the deals completed after the enactment of AML and a change in firms' post-merger cost efficiencies. We expect that firms will be more likely to merge with smaller targets to avoid being challenged by the Ministry of Commerce to initiate a deal that is anti-competitive, constituting a change in the firm's target selection behavior that may eventually limit the firm's post-merger sales revenue. If the cost efficiency hypothesis holds, then we expect the overall costs accrued from merged firms' business activities to increase because the AML mitigates acquiring firms' potential to improve their productivity and purchasing efficiency by achieving economies of scale.

Contrary to our expectation that antitrust law enforcement will lead firms to merge with smaller targets, we find that the coefficients of After*Horizontal are positive, albeit statistically insignificant, in both columns (1) and (2) of Panel A.[13] We interpret this interesting result from two perspectives. First, the AML does not limit deal size explicitly, as do antitrust laws in other developed markets.[14] Therefore, our results suggest that Chinese firms may have been engaging in suboptimal horizontal mergers with moderately sized target firms that did not meet the AML's definition of a consolidation. These horizontal mergers may be considered anti-competitive in other developed markets but are not so according to the AML. If we interpret this finding from this angle, the positive coefficient may indicate that firms gradually adjust their M&A policies in a more optimal direction by combining with larger targets. Alternatively, the positive coefficient may suggest that the AML's enforcement is too weak. Moreover, the cases described by Liu and Qiao (2012), such as Rainbow v. Johnson & Johnson and 360 v. Tencent, clearly show that the court's primary concern is protecting domestic enterprises' interests, even if doing so reduces overall market efficiency.

Next, we examine the cost behavior of acquiring firms after the enactment of the AML. We identify the cost of goods sold, selling, general, and administrative costs as proxies for firms' cost efficiency. As before, to reduce the impact of any serial correlation in costs, we regress the dependent variables, $\mathrm{Log(Cogs)}_{t+i}$ and $\mathrm{Log(SGA)}_{t+i}$, where i ranges from 1 to 3, on the set of independent variables. Both dependent variables are scaled by the acquiring firms' sales in the respective years. First, we examine the impact of a horizontal merger on firms' costs of goods sold. The coefficients of After*Horizontal in columns (1), (2), and (3) of Panel B are negative but not statistically significant at any meaningful level. These results indicate that a newly combined firm's costs from engaging in core business activities decrease by about 1.86% in the following year and up to 3.04% in the third year after the merger compared to pre-merger levels. Selling,

general, and administrative costs exhibit an increasing pattern over the three years after a merger, but the result is statistically significant at 10% for column (4) and insignificant for the remaining columns. The coefficients of Horizontal show similar patterns as After*Horizontal, but with better statistical significance. At the very least, we see that newly combined firms enjoy an improvement in direct cost efficiency (i.e., cost of goods sold), but face higher indirect costs (i.e., selling, general, and administrative) for up to three years after the combination. This raises the possibility that a decline in shareholder wealth due to business combination post AML may be attributable to an increase in direct cost. As newly combined firms must undergo internal restructuring (e.g., replacement of workers, restructuring of subdivisions, and possible sell-off of underperforming equities and plants), they might face increased indirect costs for the first few years immediately after a merger, and the above result might reflect this fact. The overall non-significance of the coefficients, however, prevents us from arguing for or against the cost efficiency hypothesis of horizontal mergers.

In addition, we look at changes in post-merger sale revenues of combined firms after the passage of AML. To reduce the impact of serial correlations among sales records, we regress the dependent variable, $Log(Sales)_{t+i}$, for i ranging between 1 and 3, on the set of independent variables that are equivalent to those in previous analyses. In this way, we can examine the impact of post-AML merger on the combined firm's sales in the coming years. In Panel C, we observe that the coefficients of After*Horizontal are negative and statistically significant at 5% in columns (1) and (2). This result shows that the newly-combined firm suffers from a decrease of 17.8% in sales revenue for the first year after engaging in horizontal merger and a decrease of 21.3% in sales two years after the merger. Meanwhile, the coefficients of *Horizontal* are positive and statistically significant at 5% as shown in columns (1) and (2), pointing out a possible scenario where had the AML not been adopted, firms would have abused their dominant market positions and expanded sales by at least 18% compared to the prior year, an outcome which is consistent with market hypothesis. Clearly, such a large decline in sales revenue of acquiring firm should be indicating that the AML has effectively restrained both anti-competitive horizontal concentration and monopolistic business practices.

Dynamic effects of the AML on announcement returns

[Table 4]

Table 4 shows the changes in horizontal M&A performance over time in accordance with the enforcement of the AML over the sample period, as estimated from equation (2).

$$CAR(-2,+2)_{it} = \alpha + \beta_1 After_{t<-3} * Horizontal_i + \beta_2 After_{t=-3} * Horizontal_i + \dots + \beta_7 After_{t=3} * Horizontal_i + \beta_8 After_{t>3} * Horizontal_i + \theta Controls_{it} + Year_t + Industry_k + \epsilon_{it} \quad (2)$$

The variables $After_{t<-k}$, $After_{t=k}$, and $After_{t>k}$ are indicator variables equal to 1 if a Chinese acquiring firm engages in an M&A in year $t = k$, where k refers to the number of years before or after the AML's effective date. We interact these nine indicator variables with Horizontal to limit our focus to horizontal mergers during our sample period. Column (1) reports the estimation results for equation (2) without control variables, and column (2) shows the results of estimating the full version of equation (2). We observe that in both columns (1) and (2), horizontal acquisitions made three or more years after AML enactment was associated with lower five-day merger announcement returns. These results are significant at the 1% and 5% levels, respectively. This finding indicates that strict regulations that curtail competition-harming business combinations between private firms take three or more years to become effective. Moreover, we observe no clear pre- and post-treatment trends around $After_{t=0}$*$Horizontal$, suggesting that our result is not subject to issues of reverse causality.

Sensitivity analysis

[Table 5]

Conventional studies often avoid using data from the Great Recession, as doing so would create unwanted noise. Thus, some formulate their sample strictly, excluding the periods after (or prior to) its outbreak. However, our analysis must consider observations around the years 2008 and 2009, as the enactment of AML roughly coincides with the outbreak of the Great Recession. An inevitable consequence of using this sample would be to isolate the effects of AML from that of the Great Recession. In panel A, we attempt to achieve this goal by using four different subsamples.

The magnitude of After*Horizontal in column (1) is clearly distinct from zero, hinting that the change in corporate environment around the years 2008 and 2009 brought about a clear downward pattern in investors' reactions to merger announcements. However, this may not serve as concrete evidence, as it falls just short of statistical significance at the 10% level. Columns (2) and (3) suggest the disappointing result that the baseline analyses for the subsample from 2008 to 2009 and for the pre-2010 subsample are both statistically and economically non-significant. Column (4) indicates that the news of horizontal M&A triggers a severely negative reaction from investors, especially after 2007. The downward pressure kicks off from 2007, with investors selling off their shares immediately after the merger announcement. The better statistical significance and higher magnitude of the coefficient of After*Horizontal in column (4) than in the others shows that investors were particularly concerned about the news of value-decreasing horizontal M&As conducted during economically difficult times. Combining these results, the enactment of AML made investors uneasy about horizontal M&A news.[15]

As a robustness check, we investigate whether altering the time windows for the CARs affects our results in Panel B. Instead of 5-day CARs, we use 3-, 7-, 11-, and 21-day CARs around merger announcement dates. Columns (1), (3), (5), and (7) of Table 5 report the results without the control variables. In all of these columns, we find that post-merger announcement returns are lower

for horizontal mergers after AML enactment. Interestingly, the CARs become increasingly negative as the time window widens. The results for 21-day CARs in columns (7) and (8) are not statistically significant, whereas the results in other columns are statistically significant at 10% or better, except for column (2). This indicates that investors may not be able to react immediately after the announcement of a horizontal merger, but they react most actively within two or three days before and after the announcement. Investors' negative reactions to merger news dissipate and other price-adjusting factors come into play as the time window widens, indicating that investors usually make investment decisions based on this information within the 11 days around the news.

[Table 6]

In Table 6, we examine the initiative for research and development (R&D) after the adoption of antitrust regulation. We repeat the baseline differences-in-differences model for a set of three new dependent variables. These variables are corporate investment levels in R&D one-, two-, and three-years after the horizontal combination of two business entities post-AML. First off, the negative coefficients for Horizontal in all columns indicate that firms would not have increased R&D spending, had the antitrust regulation been not put into effect. The coefficients show that newly-combined enterprises lower their R&D spending by approximately -.2% on average, which is consistent with earlier studies that highlight on firm's incentives to engage in acquisition for innovation (Belleflamme & Peitz, 2015; Kong, Xu, & Zhang, 2022). On the other hand, the coefficients for After*Horizontal are all statistically significant at the 5% level and display an increasing pattern as the number of years post-merger goes up. This upward trend in R&D spending could be interpreted as the newly-combined firm's incentives to increase R&D expenses to maintain a competitive edge, which is driven by the reduced gain from the adoption of a new regulation that prohibits competition-harming mergers.

[Table 7]

In Table 7, we compute the Herfindahl-Hirschman Index (HHI) at the two-digit matching SIC code, divide the sample based on the median value, and run the main model on each subsample to examine whether investors react differently to M&A news in more-concentrated/less-concentrated industries.[16] The coefficient estimate of After*Horizontal in column (1) is -0.0317, which is statistically significant at the 10% level. This result indicates that higher the degree of industry concentration, the more negatively investors react to M&A news after the adoption of AML. It is often acknowledged that the financial penalty for merger regulations is small relative to the stake at hand. However, investors might still be wary of a new merger when the acquiring firm already wields sufficient market power in a highly concentrated industry, because the proposed deal might be challenged and rejected by the government as an attempt to gain excessive market power.

CONCLUSIONS

Studies of the effects of antitrust regulations on the post-merger performance of newly combined companies have yielded inconclusive results. Moreover, nearly all prior studies focus extensively on firms located in countries that adopted comprehensive antitrust policies many decades ago. Although knowledge of corporate behavior in developed markets is widespread, the understanding of firms' merger policies and post-merger performance in developing markets is extremely limited, primarily owing to the lack of studies identifying differences in the business environments of developed and developing economies. This gap in the literature motivated us to examine the effects of China's adoption of the AML in 2008, as it is one of the most prominent developing markets worldwide. We investigated changes in the M&A policies and performance of firms headquartered in China following mergers after the AML's enactment.

We conducted a series of empirical tests using a sample of 4,784 completed merger deals announced from 2002 to 2016 to identify the effects of AML. We found that the acquiring firms' five-day CARs around the merger announcements react negatively to the adoption of the AML, suggesting that acquirers cannot earn the same level of post-merger returns as they did before the regulation came into force. This result, which is consistent with our main hypothesis 1, supports the market power hypothesis. In addition, we showed that acquiring firms engaging in horizontal mergers suffer from reduced sales and worse cost efficiency after the adoption of AML, which indicates that the antitrust reform clearly prescribes lower market dominance and less producer surplus. This result supports our main hypothesis 2, which is also in line with the cost efficiency hypothesis. Based on these findings, we argue that AML adoption decreases the shareholder wealth of producing firms, potentially resulting in improved customer welfare.

Our study has a few caveats. First, it focuses only on the short-term relationship between changes in antitrust regulations and firms' short-term post-merger returns and performance. The lack of long-term data after the adoption of AML prevents us from studying its long-run influence on firms' post-merger returns, merger policies, cost behavior, and productivity. In addition, our study does not differentiate between payment methods for financing deals. The many different results of previous studies vary depending on the method of payment used to finance M&A deals. Our methodology cannot effectively isolate the effect of AML on post-merger returns from the Great Recession. A more refined research methodology is needed to resolve this issue. Lastly, our study focuses on horizontal deals, whereas the literature also notes that vertical and tender deals, among others, lead to different post-merger firm performance outcomes and returns. These avenues await future research.

Figures

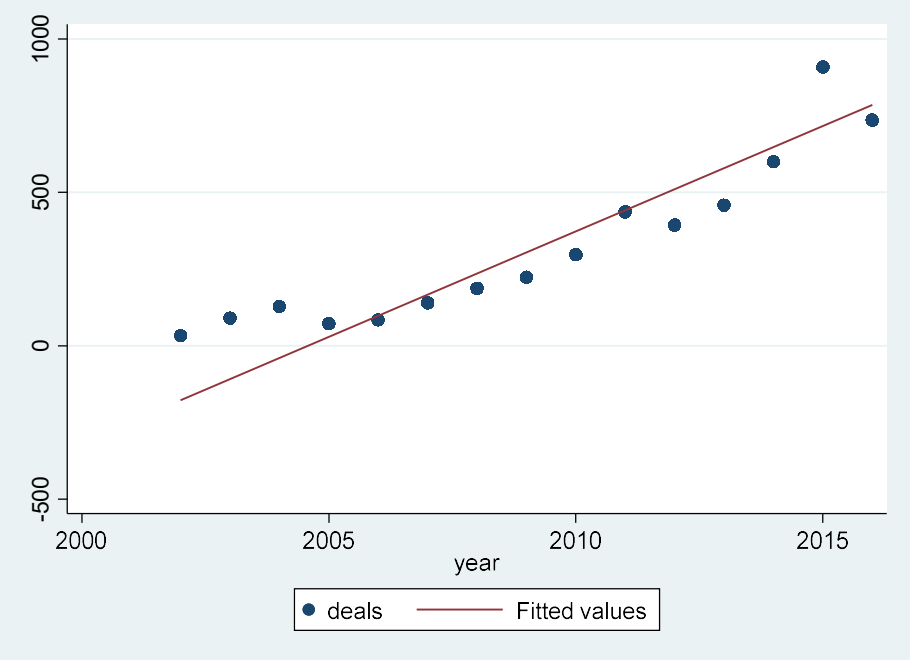

Figure 1 Number of M&A deals in China by year

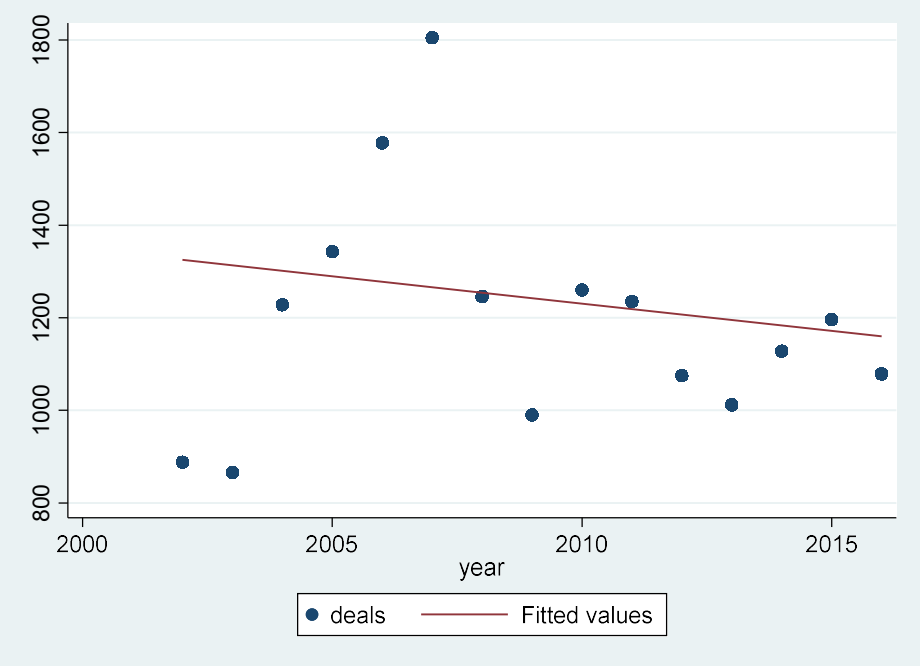

Figure 2 Number of global M&A deals excluding China and US by year

Notes: These figures show the yearly pattern of M&A deals in China (Figure 1) and those in non-US and non-China regions over the sample period (2002–2016). The blue dots mark the number of completed M&A deals, and the red line shows the fitted trend across each group.

Tables

Table 1 Descriptive statistics

Variable	*N*	Mean	Median	*SD*	P25	P75
After	4784	0.847	1	0.36	1	1
Horizontal	4784	0.114	0	0.318	0	0
CAR (−2, + 2)	4784	0.031	0.008	0.097	−0.024	0.063
Log (DealValue)	4784	3.211	3.101	1.786	1.757	4.523
COGS	4756	0.511	0.535	0.117	0.458	0.595
SGA	4757	0.154	0.13	0.106	0.081	0.196
Log (Asset)	4784	6.281	6.106	1.282	5.404	6.945
Relative Size	4653	0.129	0.026	0.32	0.008	0.091
ROA	4769	0.037	0.034	0.047	0.015	0.062
Total Leverage	4781	0.203	0.185	0.166	0.054	0.311
Cash	4663	0.183	0.148	0.132	0.092	0.237
Tangibility	4784	0.293	0.252	0.201	0.135	0.418
Tobin's Q	4629	3.048	2.325	2.335	1.544	3.708
Pure Cash	4784	0.222	0	0.416	0	0

Notes: This table reports the descriptive statistics of the variables used in our study. The sample contains 4,784 M&As conducted by firms headquartered in China over the sample period from 2002 to 2016. All variables, except binary indicators, are winsorized at the 1% level at both tails.

Table 2 Enactment of antitrust laws and announcement returns in the Chinese market

	(1) CAR(−2,+ 2)	(2) CAR(−2,+ 2)
After*Horizontal	−0.0308***	−0.0243**
	(−4.35)	(−2.79)
Horizontal	0.0175**	0.0123
	(2.83)	(1.56)
Log(Asset)		−0.00323
		(−1.86)
Relative Size		0.0370***
		(6.41)
ROA		0.0000227
		(0.00)
Total Leverage		−0.00281
		(−0.28)
Cash		−0.0255
		(−1.91)
Tangibility		−0.0200*
		(−2.29)
Tobin's Q		0.00107
		(0.93)
Pure Cash		−0.00936*
		(−2.12)
Pure Stock		0.0269**
		(3.07)
Tender		−0.0134
		(−0.44)
Public Target		0.0284*
		(2.16)
Constant	0.00756	0.0254
	(1.24)	(1.39)
Year Fixed Effects	Yes	Yes
Industry Fixed Effects	Yes	Yes
Observations	4771	4482
Adjusted R^2	0.0646	0.0991

Notes: This table shows the estimation results of the impact of China's AML on acquiring firms' merger announcement returns in the case of horizontal mergers. We use five-day CARs around merger announcement dates and the natural logarithm of the transaction values of the deals (in dollars) as the dependent variables. We also include year fixed effects and three-digit SIC industry fixed effects. We report t-statistics in parentheses below the coefficient estimates, computed using robust standard errors at the industry level. Statistical significance at the 1%, 5%, and 10% levels is denoted by ***, **, and *, respectively.

Table 3 Potential channels

Panel A: Deal Value	(1) Log(DealValue)	(2) Log(DealValue)
After*Horizontal	−0.253	−0.0876
	(−0.83)	(−0.34)
Horizontal	0.425	0.220
	(1.42)	(1.08)
Log(Asset)		0.426***
		(18.79)
Relative Size		2.820***
		(29.37)
ROA		−1.138*
		(−2.47)
Total Leverage		−0.335*
		(−2.06)
Cash		−1.071***
		(−6.03)
Tangibility		−0.0206
		(−0.09)
Tobin's Q		0.108***
		(5.59)
Pure Cash		−0.0895
		(−1.35)
Pure Stock		1.104***
		(17.73)
Tender		1.491**
		(3.36)
Public Target		0.649
		(1.85)
Constant	1.813***	−1.197*
	(10.56)	(−2.46)
Year Fixed Effects	Yes	Yes
Industry Fixed Effects	Yes	Yes
Observations	4771	4482
Adjusted R^2	0.5194	0.4917

Notes: This panel provides the estimation results of the impact of China's AML on the acquiring firm's target selection. The dependent variable, **Log(DealValue)**, is the natural logarithm of the dollar value of completed M&A deals. We also include year fixed effects and three-digit SIC industry fixed effects. We report *t*-statistics in parentheses below the coefficient estimates, computed using robust standard errors at the industry level. Statistical significance at the 1%, 5%, and 10% levels is denoted by ***, **, and *, respectively.

Panel B: Cost behavior

	(1) $Log(Cogs)_{t+1}$	(2) $Log(Cogs)_{t+2}$	(3) $Log(Cogs)_{t+3}$	(4) $Log(SGA)_{t+1}$	(5) $Log(SGA)_{t+2}$	(6) $Log(SGA)_{t+3}$
*After*Horizontal*	−0.0186	−0.0346	−0.0304	0.0261*	0.0283	0.0152
	(−1.11)	(−1.51)	(−1.35)	(2.09)	(1.38)	(0.71)
Horizontal	−0.0278**	−0.0151	−0.0196**	0.0149	0.0119	0.0196*
	(−3.33)	(−1.97)	(−2.77)	(1.32)	(1.66)	(2.11)
Log(Asset)	0.00345	0.00413	0.00531	−0.00904***	−0.00812***	−0.00923***
	(1.16)	(1.35)	(1.85)	(−6.01)	(−4.21)	(−4.38)
Relative Size	−0.0103	−0.0177*	−0.0160*	−0.00817	−0.0113*	−0.00621
	(−1.98)	(−2.57)	(−2.28)	(−1.87)	(−2.17)	(−1.07)
ROA	−0.539***	−0.435***	−0.366***	−0.215***	−0.140*	−0.0824
	(−8.42)	(−7.11)	(−4.14)	(−4.16)	(−2.54)	(−1.10)
Total Leverage	0.0487*	0.0594**	0.0559*	−0.0751***	−0.0490*	−0.0530*
	(2.36)	(2.71)	(2.45)	(−4.39)	(−2.21)	(−2.67)
Cash	−0.0796**	−0.0813**	−0.0845**	0.0776*	0.0766**	0.0555*
	(−2.75)	(−3.00)	(−3.36)	(2.66)	(3.00)	(2.23)
Tangibility	−0.0526*	−0.0600**	−0.0624**	−0.0268	−0.0442	−0.0508
	(−2.66)	(−2.68)	(−2.81)	(−1.18)	(−1.79)	(−1.76)
Tobin's Q	−0.00775***	−0.00720***	−0.00663***	0.00737***	0.00648***	0.00541***
	(−4.38)	(−3.75)	(−3.60)	(5.30)	(4.21)	(3.50)
Pure Cash	−0.00538	−0.00536	−0.00712	0.00400	0.00485	0.00336
	(−1.36)	(−1.49)	(−1.80)	(1.07)	(1.39)	(0.89)
Pure Stock	0.0103*	0.0126*	0.0125*	−0.0137*	−0.0117*	−0.0122*
	(2.06)	(2.32)	(2.21)	(−2.53)	(−2.38)	(−2.17)
Tender	−0.00952	−0.0102	−0.0458	0.00146	−0.00877	−0.00829
	(−0.45)	(−0.33)	(−1.36)	(0.07)	(−0.31)	(−0.26)
Public Target	−0.0000320	−0.00887	−0.00156	0.0318**	0.0400	0.0443*
	(−0.00)	(−0.41)	(−0.06)	(2.74)	(1.96)	(2.13)
Constant	0.603***	0.594***	0.594***	0.177***	0.178***	0.204***
	(15.57)	(13.40)	(19.74)	(7.55)	(9.07)	(6.73)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4458	4455	4442	4458	4455	4443
Adjusted	0.3147	0.2957	0.2731	0.3357	0.3006	0.2691

Notes: This panel provides the estimation results of the impact of China's AML on the acquiring firm's post-merger cost behavior. The dependent variables, $\mathbf{Log(Cogs)_{t+i}}$ and $\mathbf{Log(SGA)_{t+i}}$, are the natural logarithm of a firm's cost of goods sold and selling general and administrative costs, both scaled by sales. The subscript *t* indicates the year of the adoption of the Anti-Monopoly Law, and *i* ranges between 1 and 3. We employ five-day CARs around the merger announcement date as the dependent variable. We also include year fixed effects and three-digit SIC industry fixed effects. The *t*-statistics, reported in parentheses below the coefficient estimates, are computed using robust standard errors at the industry level and statistical significance at the 1%, 5%, and 10% are denoted by ***, **, and *, respectively.

Panel C: Sales behavior

	(1) Log(Sales)_{t+1}	(2) Log(Sales)_{t+2}	(3) Log(Sales)_{t+3}
After*Horizontal	-0.178*	-0.213*	-0.176
	(-2.65)	(-2.44)	(-1.75)
Horizontal	0.185**	0.212**	0.189*
	(3.36)	(2.82)	(2.22)
Log (Assets)	1.040***	1.016***	0.990***
	(49.42)	(45.36)	(34.82)
Relative Size	0.210***	0.296***	0.283***
	(4.21)	(4.86)	(3.80)
ROA	1.891***	1.890**	2.050**
	(3.93)	(3.20)	(2.93)
Total Leverage	-0.432***	-0.601***	-0.572***
	(-3.84)	(-4.25)	(-3.78)
Cash	-0.572**	-0.396	-0.173
	(-3.17)	(-1.91)	(-0.80)
Tangibility	-0.263	-0.0735	0.0119
	(-1.89)	(-0.41)	(0.06)
Tobin's Q	0.0324**	0.0465***	0.0432**
	(3.06)	(4.25)	(3.39)
Pure Cash	-0.0318	-0.0461	-0.0524
	(-1.23)	(-1.71)	(-1.61)
Pure Stock	0.197***	0.198**	0.195**
	(3.84)	(3.40)	(2.74)
Tender	-0.629*	-0.591	-0.476
	(-2.11)	(-1.72)	(-1.67)
Public Target	-0.123	-0.122	-0.0921
	(-0.92)	(-0.89)	(-0.55)
Constant	1.635***	1.687***	1.833***
	(6.64)	(5.79)	(5.87)
Year Fixed Effects	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes
Observations	4462	4458	4445
Adjusted R^2	0.8034	0.7433	0.6925

Notes: This table provides the estimation results of the impact of Chinese Anti-Monopoly Law on acquiring firm's post-merger sales. The dependent variable, $Log(Sales)_{t+i}$, is natural logarithm of firm's sales revenue. The subscript t indicates the year of the adoption of the Anti-Monopoly Law, and i ranges between 1 and 3. We also include year fixed effects and three-digit SIC industry fixed effects. The t-statistics, reported in parentheses below the coefficient estimates, are computed using robust standard errors at the industry level and statistical significance at the 1%, 5%, and 10% are denoted by ***, **, and *, respectively.

Table 4 Dynamic effects of antitrust law enactment on announcement returns for horizontal mergers

	(1) CAR(−2,+2)	(2) CAR(−2,+2)
$After_{t\leq -3}$*Horizontal	0.0114	0.00691
	(1.35)	(0.67)
$After_{t=-3}$*Horizontal	−0.0501	−0.0543*
	(−1.87)	(−2.28)
$After_{t=-2}$*Horizontal	−0.0129	−0.0301
	(−0.69)	(−1.65)
$After_{t=-1}$*Horizontal	0.0297**	0.0177
	(2.84)	(1.29)
$After_{t=0}$ *Horizontal	0.0384	0.0395
	(1.79)	(1.95)
$After_{t=1}$*Horizontal	0.0404	0.0233
	(1.32)	(0.87)
$After_{t=2}$*Horizontal	0.00622	0.00784
	(0.41)	(0.49)
$After_{t=3}$*Horizontal	−0.0140	−0.0137
	(−1.35)	(−1.37)
$After_{t\geq 3}$*Horizontal	−0.0182***	−0.0158**
	(−3.58)	(−3.03)
Constant	0.00871	0.0279
	(1.29)	(1.46)
Controls	No	Yes
Year Fixed Effects	Yes	Yes
Industry Fixed Effects	Yes	Yes
Observations	4771	4482
Adjusted R^2	0.0656	0.0998

Notes: This table provides the estimation results of the dynamic effects of China's AML on acquiring firms' merger announcement returns over seven different time intervals for horizontal mergers. The variables $After_{t<-k}$, $After_{t=k}$, and $After_{t>k}$ are indicator variables that equal 1 if an acquirer engages in an M&A in year $t = k$, where k denotes the number of years before or after the effective date of the AML. The dependent variable is the five-day CAR around the merger announcement dates. We also include year fixed effects and three-digit SIC industry fixed effects. We report t-statistics in parentheses below the coefficient estimates, computed using robust standard errors at the industry level. Statistical significance at the 1%, 5%, and 10% levels is denoted by ***, **, and *, respectively.

Table 5 Sensitivity analyses

Panel A: Subsample approach

	(1) Excluding 2008 & 2009 CAR(−2,+2)	(2) Only 2008 & 2009 CAR(−2,+2)	(3) Pre-2010 CAR(−2,+2)	(4) Post-2007 CAR(−2,+2)
After*Horizontal	−0.0132	−0.0027	0.0185	−0.0515*
	(−1.71)	(−0.07)	−0.58	(−2.65)
Horizontal	0.000358	0.0228	0.00651	0.0403
	−0.07	−1.02	−0.79	−1.98
Constant	0.0339	0.0194	−0.00617	0.0285*
	−1.87	−0.44	(−0.14)	−2.28
Controls	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes
Observations	4076	406	812	4076
Adjusted R^2	0.099	0.1409	0.094	0.1

Notes: This table provides the estimation results of the four different subsamples formed using different year windows. We repeat the baseline analysis using these subsamples to determine in which of the available subsamples the effect of AML is most strongly manifested. The dependent variable is the five-day CAR around the merger announcement dates. We also include year fixed effects and three-digit SIC industry fixed effects. We report *t*-statistics in parentheses below the coefficient estimates, computed using robust standard errors at the industry level. Statistical significance at the 1%, 5%, and 10% levels is denoted by ***, **, and *, respectively.

Panel B: Different CAR windows

	(1) CAR(−1,+ 1)	(2) CAR(−1,+ 1)	(3) CAR(−3,+ 3)	(4) CAR(−3,+ 3)
After*Horizontal	−0.0178**	−0.0138	−0.0305***	−0.0237**
	(−2.84)	(−1.92)	(−4.17)	(−2.94)
Horizontal	0.0102	0.00768	0.0167**	0.012
	−1.99	−1.16	−2.69	−1.68
Constant	0.00618	0.0243	0.0173	0.0301
	−1.24	−1.78	−1.89	−1.53
Controls	No	Yes	No	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes
Observations	4771	4482	4771	4482
Adjusted R^2	0.0701	0.105	0.0561	0.0852

	(5) CAR(−5,+ 5)	(6) CAR(−5,+ 5)	(7) CAR(−10,+ 10)	(8) CAR(−10,+ 10)
After*Horizontal	−0.0367*	−0.0301*	−0.0319	−0.0189
	(−2.61)	(−2.16)	(−1.88)	(−0.93)
Horizontal	0.0184	0.0138	0.0167	0.00589
	−1.74	−1.32	−1.55	−0.36
Constant	0.0209	0.0141	0.0217	0.00684
	−1.62	−0.59	−1.75	−0.23
Controls	No	Yes	No	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes
Observations	4771	4482	4771	4482
Adjusted R^2	0.0532	0.0868	0.0549	0.0864

Notes: This table provides the estimation results of the impact of China's AML on acquiring firms' merger announcement returns using various time windows. Instead of 5-day CARs, we use the 3-, 7-, 11-, and 21-day CARs around the merger announcement dates as dependent variables. We also include year fixed effects and three-digit SIC industry fixed effects. We report t-statistics in parentheses below the coefficient estimates, computed using robust standard errors at the industry level. Statistical significance at the 1%, 5%, and 10% levels is denoted by ***, **, and *, respectively.

Table 6 Enactment of antitrust laws and post-merger RND initiatives

	(1) RND_{t+1}	(2) RND_{t+2}	(3) RND_{t+3}
After*Horizontal	0.00575**	0.00661**	0.00738**
	(-2.85)	(-3.01)	(-3.06)
Horizontal	-0.00298**	-0.00233*	-0.00275
	(-2.96)	(-2.08)	(-1.93)
Log (Assets)	0.000053	-0.00044	-0.00062
	(-0.11)	(-0.67)	(-1.09)
Relative Size	-0.00297*	-0.00417***	-0.00425**
	(-2.60)	(-3.53)	(-3.32)
ROA	0.0101	0.00425	0.0179
	(-0.83)	(-0.29)	(-1.52)
Total Leverage	-0.0173***	-0.0102*	-0.0186***
	(-3.59)	(-2.36)	(-3.69)
Cash	0.00481	0.0161*	0.0235*
	(-0.94)	(-2.09)	(-2.62)
Tangibility	0.00247	0.000242	0.000959
	(-0.74)	(-0.07)	(-0.24)
Tobin's Q	0.00134***	0.00113**	0.00102**
	(-3.7)	(-3)	(-3.37)
Pure Cash	-0.00022	-0.00032	0.000359
	(-0.26)	(-0.23)	(-0.32)
Pure Stock	-0.00464**	-0.00405*	-0.00356
	(-3.17)	(-2.23)	(-1.75)
Tender	0.00346	0.00992*	0.00149
	(-0.95)	(-2.43)	(-0.18)
Public Target	0.00407	0.00341	0.00321
	(-1.43)	(-0.9)	(-0.78)
Constant	-0.00287	-0.00355	-0.00433
	(-0.50)	(-0.54)	(-0.60)
Year Fixed Effects	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes
Observations	4465	4480	4480
Adjusted R^2	0.4618	0.4299	0.4241

Notes: This table provides the estimation results of the impact of Chinese Anti-Monopoly Law on acquiring firm's RND initiatives. The dependent variable, RND_{t+i}, is the acquiring firm's research and development scaled by total asset. The subscript t indicates the year of the adoption of the Anti-Monopoly Law, and i ranges between 1 and 3. We also include year fixed effects and three-digit SIC industry fixed effects. The t-statistics, reported in parentheses below the coefficient estimates, are computed using robust standard errors at the industry level and statistical significance at the 1%, 5%, and 10% are denoted by ***, **, and *, respectively.

Table 7 Subsample analysis using HHI as a proxy for industry concentration

	(1) Higher than Median CAR(−2,+ 2)	(2) Lower than Median CAR(−2,+ 2)
After*Horizontal	−0.0317*	−0.0171
	(−2.20)	(−1.30)
Horizontal	0.0182	0.0092
	−1.32	−0.87
Log(Assets)	−0.00581	−0.00136
	(−1.91)	(−0.64)
Relative Size	0.0367**	0.0383***
	−3.95	−4.97
ROA	0.0179	−0.0157
	−0.29	(−0.33)
Total Leverage	0.00902	−0.0124
	−0.61	(−0.72)
Cash	−0.0226	−0.0283
	(−1.26)	(−1.31)
Tangibility	−0.0173*	−0.0256
	(−2.66)	(−1.64)
Tobin's Q	0.000974	0.00109
	−0.52	−0.78
Pure Cash	−0.0132*	−0.00563
	(−2.79)	(−0.83)
Pure Stock	0.0349*	0.0202
	−2.55	−1.62
Tender	−0.0244	−0.014
	(−1.07)	(−0.36)
Public Target	0.0179	0.0350*
	−0.83	−2.13
Constant	0.0279	0.029
	−0.74	−1.44
Year Fixed Effects	Yes	Yes
Industry Fixed Effects	Yes	Yes
Observations	2264	2218
Adjusted R^2	0.0996	0.0933

Notes: This table provides the estimation results of the impact of China's AML on acquiring firms' merger announcement returns. A subsample is formed using the median value of the Herfindahl-Hirschman Index (HHI) at the two-digit matching SIC code. The HHI proxies for industry concentration and the dependent variable are five-day CARs around merger announcement dates. We also include year fixed effects and three-digit SIC industry fixed effects. We report t-statistics in parentheses below the coefficient estimates, computed using robust standard errors at the industry level. Statistical significance at the 1%, 5%, and 10% levels is denoted by ***, **, and *, respectively.

ENDNOTES

[1] Overwhelmingly many Asian countries have passed antitrust laws in the last few decades, with a few exceptions that passed such laws earlier, such as Japan, which enacted the AML in 1947, and Korea, which adopted the Monopoly Regulation and Fair Trade Act in 1980. Most Southeast Asian countries adopted antitrust laws in the late 2010s.

[2] The first amendment to the AML was drafted on January 2, 2020. A new provision (Article 17) and revisions to an existing provision (Article 16), as well as an increase in fines for infringing the AML from 500,000 RMB to 5 million RMB, can be interpreted as being directed more toward regulating cartels and price fixing behaviors than toward discouraging monopolies. The latest amendment was drafted on May 14, 2020 to further close loopholes and mitigate anti-competitive business practices and combinations.

[3] According to the guideline provided by AML, a transaction must be notified to the State Administration for Market Regulation (SAMR) if any of the following turnover thresholds are met in the last financial year: First, the combined total worldwide turnover of undertakings participating in the concentration exceeds 12 billion RMB and at least two of these undertakings each had a turnover of more than 800 million RMB within mainland China; the combined total turnover within mainland China of the undertakings participating in the concentration exceeds 4 billion RMB; or, the turnover of at least one of the business operators participating in the merger exceeds 100 billion RMB. The final requirement was added as of May 14, 2020, which is more targeted towards large technology and platform corporations. The addition of the last requirement was probably spurred by the acquisition of Uber's business in China by the Chinese ride-hailing company Didi Chuxing in 2016. At the time of merger, the combined total turnover in China did not meet the threshold for a review, yet this horizontal acquisition removed the only major competitor in the ride-sharing industry, giving Didi Chuxing a significant market lead through which the newly-combined firm could potentially abuse its market dominant position in competition-harming ways (Han & Gao, 2021). This new requirement enables the authorities to look at any deals made by any large companies, no matter how small the target is.

[4] Norton Rose Group published a report detailing merger control efforts by the Ministry of Commerce of the People's Republic of China (MOFCOM). According to the summary statistics, MOFCOM reviewed 17 cases in 2008, 80 cases in 2009, 117 cases in 2010, and 168 cases in 2011. However, under Chapter 4 of the AML, only 1 merger proposal was turned down by MOFCOM in 2009, and a total of 10 proposals were granted conditional clearance between 2008 and 2011. According to an additional report by Deng and Huang, MOFCOM blocked only two transactions and imposed remedies on 38 out of more than 2000 total transactions reviewed over a decade after the enactment of AML (from 2008 to 2018). As a part of the government overhaul, the SAMR is now in charge of market-supervising duties, in place of MOFCOM.

[5] Only 2 of the 25 largest Chinese enterprises based on annual revenues are public firms, according to rankings provided by the 2020 Fortune Global 500. Of the remaining firms, 20 firms are SOEs and 3 are private firms.

[6] For instance, in Rainbow v. Johnson & Johnson, a case between a domestic distribution firm and a foreign pharmaceutical firm, the court ruled that Johnson & Johnson's resale price maintenance practices violated the AML, although such vertical price restraints are widespread across industries in China. However, in 360 v. Tencent, a case between two Chinese internet companies over competition practices, the court determined that Tencent did not violate the AML.

[7] On July 7, 2021, the Associated Press reported that Chinese Internet giants, such as Alibaba and Tencent, had been penalized for abusing their dominant market positions. Alibaba's fine amounted to at most $2.8 billion. Ironically, the *Wall Street Journal* reported on April 1, 2021, that the merger of ChemChina and SinoChem, two chemical giants headquartered in China, had been approved by the state-owned assets supervision and administrative commission, allowing the state to gain command of the newly combined firm's assets, valued at approximately $245 billion.

[8] The degree of monopolization by foreign companies, which is often exaggerated in the Chinese media, is far less than the degree of monopolization in industries controlled by SOEs (Duane & Saich, 2014).

[9] The literature indicates that there could exist a winner's curse problem, as target firm shareholder returns are, on average, positive compared to that acquirer firm shareholder returns are, in general, negative (Mulherin & Boone, 2000). When taken together, the combined shareholder returns after M&A are, in general, positive, implying that the merger indeed creates a value for both parties involved (Martynova & Renneboog, 2008). Regardless of which party benefits more from the trade, we examine whether the antitrust reform would bring about any additional downward pressure in the acquiring firm's shareholder return.

[10] This may be due to restricted offerings by SDC, but we have no practical way to gain access to more data.

[11] None of the papers to our knowledge provides a clear explanation of why the number of mergers activity began to expand at the turn of year 2008. Zhu and Zhu (2016) review Chinese M&A research conducted between 2009 and 2015 and summarize that Chinese firms were less affected by the Great Recession in 2007 and thus were able to engage in more cross-border M&As. However, the increasing number of both domestic and cross-border deals is not empirically supported by any of the papers they listed.

[12] We observe relatively low value of adjusted R-squared for both columns because the regression model employs variables of different time dimensions. Specifically, firm-level variables (independent variables) are measured in fiscal years, whereas stock-price reactions (dependent variable) are measured in trading days for up to 21 days. All tables that employ CAR as the dependent variable suffer from extremely low R-squared values (of lower than 10%), whereas other tables that employ firm-level variables report acceptable R-squared values (of at least 25%). As such, this should not be interpreted as a poor fit, but rather as a possible misspecification (or a conventional practice) to which an empirical remedy has yet to be developed. It is extremely difficult to develop a new measure of stock-price reaction that shares the time dimension with the firm-level variables and that filters all the irrelevant factors and noise out of the equation. The implicit rule of thumb throughout all empirical exercises is to retain the model that contains all control variables, year fixed effects, and industry fixed effects.

[13] Cross-border deals are also required to follow the guidelines set forth by the AML. Specifically, the AML states, in Article 2, that "this law is applicable to monopolistic conducts in economic activities within the territory of the People's Republic of China; and it is applicable to monopolistic conducts outside the territory of the People's Republic of China that serves to eliminate or restrict competition in the domestic market of China." In unreported analyses, we use two subsamples to examine whether the acquirer's target selection is influenced by the AML. The first subsample is composed of the entire sample excluding cross-border deals, and the second subsample consists only of cross-border deals in which the acquirers are headquartered in China. We fail to identify statistically significant results in either of these subsamples.

[14] Although the AML forbids administrative monopolies, the enforcement agency plays only an advisory rather than a suppressive role, suggesting that tackling administrative monopolies through the legal system is not feasible in China (Owen et al., 2008).

[15] Whether this downward trend is driven solely by the enactment of AML or by the Great Recession remains unclear, but there seems to be no empirically clear solution to this issue.

[16] Relatedly, Kong, Xu, and Zhang (2022) examine the impact of AML (especially, Articles 33, 34, and 35) on the firm's total productivity by focusing on how the measures that protect industry competition at the city level (measured by marketization index) would curb monopolistic corporate behavior, but rather induce firms with large market power to maintain a competitive edge by enhancing investment and innovation efficiency. Due to data limitations, we were unable to perform a similar exercise.

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