The Impact of the Deleverage Policy and Shadow Banking Regulation on Financial Market Performance: Empirical Evidence from China

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Abstract: Deleveraging policies have been a controversial topic in the corporate finance sector; this paper used samples of public listed firms in Hong Kong and Mainland China to study the Chinese 2018 deleverage policy and shadow bank regulations 'impact on the financial market. With the implemented research method, the paper finds the regulation had negatively impacted the equity market performance and may have created additional burdens for the firms. Our finding suggests regulators should be cautious in terms of making policies, and with economic policies 'uncertainties, there might be unwanted consequences.

Keywords: Deleveraging; Shadow Bank; Financial Market; Stock Performance; Financial Regulation; Government Intervention

1. Introduction and Literature review
1.1 Background

From 2014 to June 12th, 2015, the Chinese stock market was considered to have a rapid market boom, while the Shanghai index increased to 5178.19 points from 3234.68 points, accounting for a 37.5% increase in the asset price. Liu's study on the shadow bank sector has shown the trust fund played a significant role in the stock market boon between 2014 and 2015. They have interfered with the stock market as they designed certain financing channels called "umbrella trusts" to satisfy individual investors 'financing needs. Such channels can surpass the regulation so that the trust funds can lend money to unqualified individual investors. (Liu, 2019)

From June 12th, 2015 to January 27th, 2016, the Mainland Chinese stock market was crushed by nearly 50% as the Shanghai index's peak of 5178.19 points to the bottom of 2638.3 points, accounting for 49% erase of the market value. (FactSet, 2022) Shortly after the stock crash, regulators, media reporters and average investors criticized the shadow banking sector, and its association with the shadow landings had caused the quick built up and crackdown of bubbles. (Wildau, 2015)

In the paper, "The Nexus of Monetary Policy and Shadow Banking in China," Chen, Ren, and Zha have found the fast growth speed of the Chinese economy, and contradictory monetary policy between 2009-2015 has caused the shadow bank sector to grow rapidly. (Chen et al., 2018)

According to Bloomberg, in 2018, the shadow bank sector has grown into a size of $10 trillion ecosystems, and it has been associated with thousands of financial institutions, local governments and millions of households. The related asset management, wealth management products, and their interference with the financial market have created significant potential threats to the financial system's safety. (Luo, 2018)

Liu's study also emphasized that trust funds are having significant association with the bond market and local government's debt and play a negative role in passing through the policy rate to commercial banks 'lending rate. In together, the study defined shadow bank sector may cause potential systematic risks to Chines financial market; the government should take action to regulate the industry. (Liu, 2019)

Critics around the shadow bank sector that has grown with the Chinese economy have finally attracted Chinese regulators ' attention. The government first mentioned the deleveraging reform in 2015, and the government's attitude toward regulations, shadow banks and the associated deleveraging reform is becoming more serious in 2016 and 17. (Li et al., 2017) Finally, in 2018, the detailed policy came in place; the government targeted to regulate and the crackdown on the shadow bank sector and its related shadow landings. (Reuters, 2018)

1.2 Literature review and contribution

Before the implementation of deleveraging policies, one of the central bank's working papers had urged the government to be cautious when putting the deleverage policy in place, arguing for the fact that leverage ratio isn't the problem in the first place, but using these leverage efficiently is the key point. The fact that State-owned firms and big firms have more access to the financing channel than other firms caused an inefficient allocation of financing channels. (Li et al., 2017)

Our study researched China's deleveraging policy. Especially its regulation of the shadow banking sector's impact on the country's financial market performance and firm performance. Many previous research works have focused on deleveraging policies ' impact on the financial market and firm performances in developed market economies and the background insights of China's deleveraging policy in 2018; our study made contributions by providing an insight into how a deleveraging policy implemented by an authoritarian government's impact on its financial market and economies.

2. Research design

2.1 Data

The data source for this paper is gathered through WIND (institutional database); the data set originally contains 2013-2019 annual data for Chinese listed companies in Mainland and Hong Kong. We have removed all cross-listing firms and companies with missing data. All the firms are described in the following characteristics, Year, Tobin's Q, Policy(cutoff dummy for time-variable), Total Asset, Revenue, Profit, Liability, Equity, ROA, ROE, Institutional investor's ownership, QFII(Qualified foreign institutional investor ownership), Stock listed length, State-owned enterprise dummy(1 for state-owned, 0 for otherwise), Foreign-owned enterprise dummy(1 for foreign-owned, 0 for otherwise), Market capitalization, Number of analysts following, Average daily stock turnover rate, Stock return rate, Region dummy(1 for Mainland, 0 for HongKong), Leverage ratio, Ln of Total Asset, Ln of stock listed length, Ln of Market cap.

2.2 Method

We implemented a diff in diff method with the data we have; we took firms listed in Hong Kong as the control group and firms listed on the mainland as the treatment group. The rationale for taking Hong Kong as the main control group is that there is much overlap in business operations for Hong Kong and mainland firms; the management team shares similar cultural backgrounds. Moreover, the mainland financial market regulations have no direct impact on the Hong Kong market. For example, Hong Kong has its own currency, and the Chinese government implements foreign exchange control.

Since the regulation policy regards the shadow banking sector has been already mentioned several times before the implementation, we set the policy cutoff as the variable year 2016 because we expected to see anticipation effects. As all the annual data records the data that occurs at the end of the year, "2016" represents all observations 'status exactly one year before the policy implementation.

The main equation has stock return rate as the dependent variable; we have the DiD factor as the interaction term of region and policy, the region is the treated variable, the companies in the mainland have region = 1 and Hong Kong as region = 0. The policy variable we have equals 1 after 2016 and 0 before 2016. Meanwhile, the control variables account for firms 'listed length, state dummy, year dummy, industry and number of analysts following.

$$Return = \alpha_{it} + \gamma_s + \lambda_t + \delta_{DD} \times D_{treat} + \rho X_{it} + \epsilon_{it}$$

Main Equation

3. Results

3.1 Summary statistics

In terms of the firm's nature, there are some differences between firms listed in Hong Kong and firms on the Mainland. Compared to firms in Hong Kong, firms in the Mainland generally are bigger and have a higher leverage ratio. Further, we have observed the stock market and firms 'performance are generally better on Mainland. (See Appendix 1)

3.2 Parallel trend assessment

Before discussing the result of this diff in diff design, we want to assess the difference between firms listed in Mainland and firms listed in Hong Kong before and after the implemented policy to see if they fulfill the parallel trend assumption. Specifically, we want to see firms 'basic characteristics; again, the cutoff year is 2016. All graphs represented the difference in such characteristics between firms listed in Mainland and Hong Kong. We first assess the change in the ROA and ROE before and after the policy cutoff; we do observe an around three percentage points drop in the year 2018 for both ratios and slight decline trends that may imply some anticipation effect. (See Appendix 2-3)

There is a significantly lower stock turnover rate after the policy implementation, implying the stock market is experiencing lower liquidity and being less active than before. The graph indicates a spike in the turnover rate in 2015; this is because the Mainland is having a radical market boom driven by the shadow banking sector. (See Appendix 4)

We observed an increase in firms 'leverage ratio after implementing the policy; we suspect this is true of the mechanism related to the limited financing channels. As the accounting equation stated below, firms can only support their operations through equity financing or debt financing; since the regulation policy targets the shadow bank sector after the regulator released the policy, it's more difficult for firms was finance through the equity market. The market's financing and liquidity are declining, meaning the firms can only choose to finance their operations by raising their liabilities. (See Appendix 5)

$$Asset = Liability + Equity$$

Overall, those parallel trends are not perfect, we acknowledge the difference between those two markets, but we find these differences acceptable in the current context.

3.3 Baseline results

The key result is that the coefficient of DiD equals -0.06, negative six percentage points. The deleveraging policy negatively impacted the stock return rate by six percentage points by comparing the treatment and control groups. This number is both economically significant and statistically significant. Which deleveraging policy designed to hit shadow banks eventually harms the equity market. One additional note I want to highlight is that clustering groups at the industry and company level because we suspect an insufficient number of industries may cause some problems with our estimation of standard errors. With the cluster on the firm level, we observed a smaller standard error as there are more firms than industries. (See Appendix 6)

4. Limitation

However, our results contain several limitations; the long-term effects of the deleveraging policies could not be observed due to the COVID-19 pandemic. This unforeseeable event struck the global economy hard, which resulted in countries adopting unprecedentedly aggressive fiscal policies and accommodative monetary policies, which will almost inevitably increase leverage across economic agents, including both financial and non-financial sectors. It is extremely difficult to isolate the impact of COVID-19 due to the nature of this event. Therefore only the short-term effects of this policy could be observed. In addition, several uncontrollable events also happened from 2014 to 2019, namely the Trade War between China and the United States. Similarly, it is extremely difficult to isolate the impact of an event since it cannot be directly observed from data. Such events that impact the entire economy can skew our results and generate bias.

In addition to these unforeseeable and uncontrollable events that lead to potential bias in our results, we acknowledge that some preexisting selection bias exists within our model. Such selection bias is unavoidable since the two stock markets are different in nature. The Hong Kong stock exchange market generally has more minor requirements for firms' initial public offerings (IPO) and fewer regulations for the existing firms. On the other hand, the Chinese stock market has much tighter regulations regarding the IPO of firms and existing firms. For example, firms that generated a negative profit for three consecutive years were removed from the listing. This difference can also be observed in our data, as the average of firm performance indicators such as ROA and ROE is higher for the Chinese stock market. However, such differences do not impact the parallel trend assumption of our model.

Lastly, due to the limitations in our data, we were only able to observe and measure the overall impact of this policy on the stock market. However, this policy has caused significant impacts on individual households, firms, and the entire economy, which can then further affect firm performances, as measured by indicators such as ROA and ROE. This generates a small feedback loop and could further create biases in our results. The impact of the policy on households is hard to isolate due to the limitations in data collection. Contrary to firms, it is much harder to find an indicator that measures household performances, which can be relatively easier to observe since firm performances are closely related to stock prices. In addition, because these economic agents are closely correlated with each other and any agent can impact another, the impact of this policy on the entire economy is also hard to investigate since one cannot attribute the changes in the economy over a period of time to a single policy.

Conclusion

Our conclusion is in line with the momentum of the financial market. The reason behind this can be explained by the fact that the act of deleveraging policy aims to reduce the overall systematic risks caused by the shadow banking sector, but while reducing financial market risk, too much systemic deleveraging can lead to financial recession and a credit crunch. Moreover, under this policy, the restriction of equity market leveraging led to a sudden shortage of funds and a reduction in liquidity shortages in the financial markets, which caused less trading activities and asset price depreciation, resulting in a shock to the financial markets.

Based on previous literature, our paper constructed a modified-DID model using data from the Chinese stock market and the Hong Kong stock exchange to determine the effect of the deleveraging policy on equity market performances in China. Although the deleveraging policy was initially targeted at shadow banks, it has negatively impacted financial market performances, especially return on assets and return on equity. We further confirmed the robustness of the results through equilibrium tests and parallel trend tests. In addition, the fixed effect such as the SOEs(state-owned enterprises), Foreign-owned enterprises, year, listed length and industry in the model to estimate the effect more precisely.

This generated significant losses for both households and firms, which thus impacted the entire Chinese economy. We advise policymakers to be cautious when implementing deleveraging policies in the future as they would greatly impact the entire market, and our suggestions coincide with the conclusions of a Chinese central bank working paper. In addition, our paper provides a foundation for future researchers that wish to investigate the impact of deleveraging policies further. As mentioned previously, due to the limitations of our data, we were unable to address unobservable issues that arose due to the deleveraging policies, such as the impact on households and firms. Therefore, we hope to provide insight into this issue and build a preliminary basis for future research.

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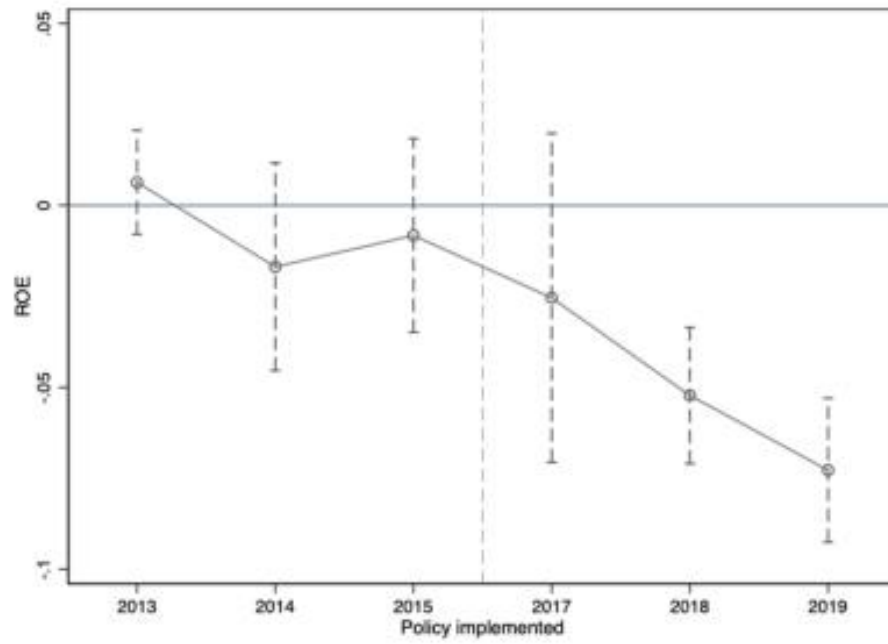
Appendix

	variables	Baseline characteristics	HK	A share
1	performance	Firm's performance	2.131201	2.937202
2	asset	Total asset	43815.64	67212.56
3	rev	Revenue	7575.04	11663.79
4	profit	Profit	932.8124	1263.913
5	liability	Liability	33843.65	56747.89
6	equity	Equity	9968.58	10464.67
7	ROA	Return on assets (net income/total assets)	-.0166449	.0347746
8	ROE	Return on equity (net income/equity)	-.2541946	.0404552
9	state	State owned = 1/ Private owned = 0	.1093705	.3356448
10	foreign	Owned by foreign investors	.2971376	.0310856
11	mktcap	Market cap	14115.83	17327.6
12	turnover	Stock turnover rate	.5441176	6.680842
13	return	Stock return rate	.069318	.2929038
14	lever	Leverage ratio	.4985956	.4479792

Appendix 1
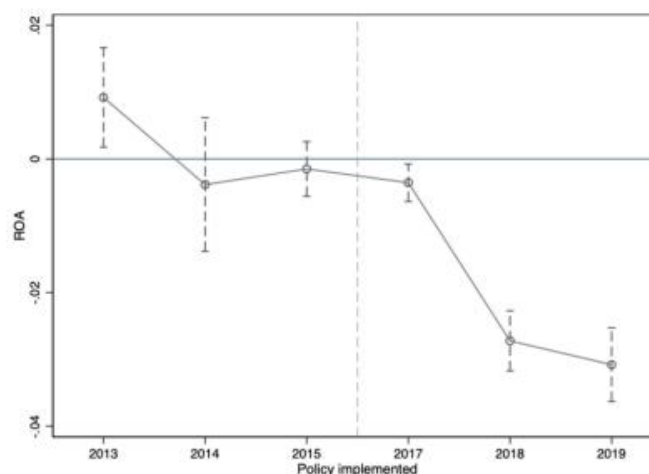
Appendix 2

Appendix 3
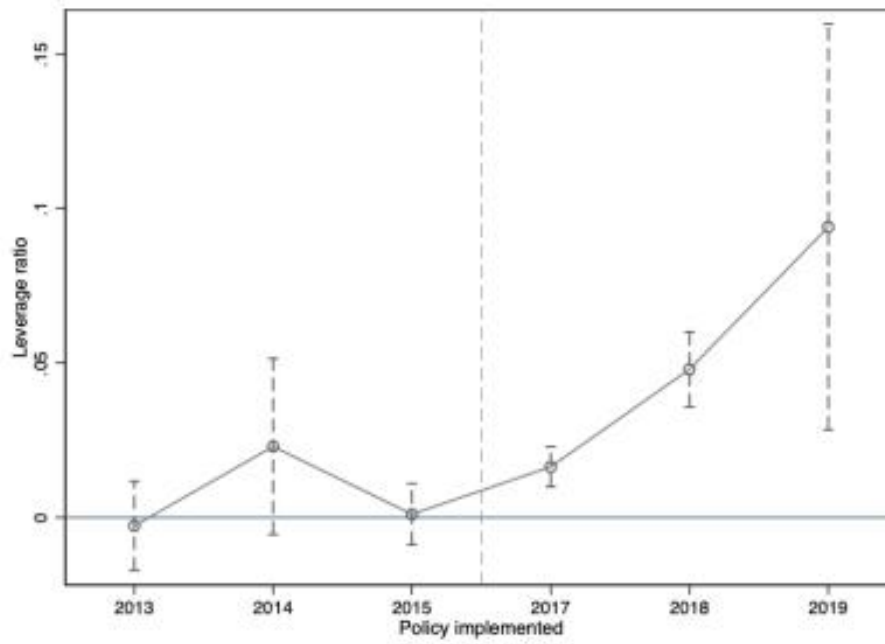
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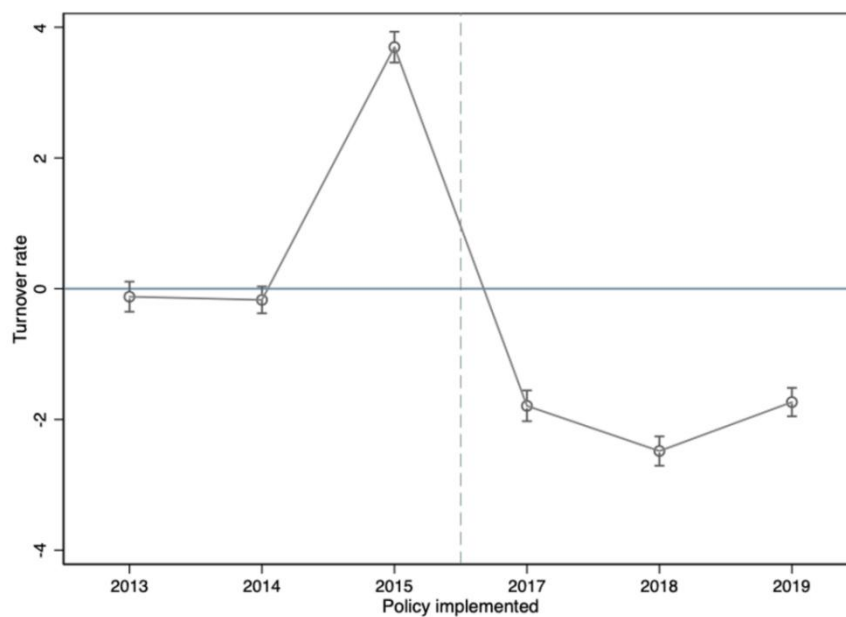
| | (1) | (2) |
VARIABLES	return_cluster_ID	return_cluster_industry
did	-0.0623**	-0.0598
	(0.0202)	(0.0856)
FEs	Yes	Yes
Year	Yes	Yes
State	Yes	Yes
Industry	Yes	No
Constant	0.512**	0.554**
	(0.0817)	(0.0493)
Observations	25,086	25,086
R-squared	0.159	0.159

Robust standard errors in parentheses
** p<0.01, * p<0.05

Appendix 6