Event Study:

The Effect of “Double Reduction” Policy on Chinese Education Stocks

by

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An honors thesis submitted in partial fulfillment

of the requirements for the degree of

Bachelor of Science

Business and Economics Honors Program

NYU Shanghai

May 2022

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1. **Introduction**

In the summer of 2021, the Chinese government issued a new round of policies to promote the development of teenagers, including a tightened regulation on the K-12 education industry. Here, the term “K-12” is a shortening for the period from kindergarten to 12th grade. It originally refers to the publicly funded primary and secondary education in the United States (Gavin, k12academics.com), which is comparable to kindergarten schooling and compulsory education before college in Mainland China. On July 24, 2021, the General Office of the Communist Party of China Central Committee and the General Office of the State Council issued the document “Opinions on further reducing the burden of compulsory education students’ homework and off-campus training,” the requirements of which includes reducing homework, improving quality of after-class services provided by schools, and tightening supervision of off-campus tutoring programs. Detailed regulations related to the last requirement, such as “existing off-campus curriculum subject-tutoring institutions shall be registered as non-profit institutions” and “curriculum subject-tutoring institutions are not allowed to go public for financing” (moe.gov.cn), have attracted widespread attention and directly triggered a slump in the financial market.

On July 23, one day before the official release of the “Double Reduction” policy, the full contents of this policy document have been leaked and widely spread on the Internet (Li, Sina Finance). It directly led to the overall market value of the H-share education sector evaporating by HK$ 46.7 billion (~¥37.4 billion). Upon the opening of the US stock market that night, the China concept stocks related to education continued to plummet. Gaotu, New Oriental, and TAL once fell by more than 58%. The total market value of these three stocks mentioned above has evaporated by a total of $15.4 billion (~¥100 billion) in a single day (Chen, Sina Finance). On July 26, the first trading day after the release, the education sectors of A-shares and H-shares both dived (Guo, Shanghai Security News). The stock price of Doushen Education, Kingsun, Xueda Education, and Only Education all fell their limit, while Scholar Education fell by more than 45%, and New Oriental fell by more than 47%.

This paper aims at investigating the impact imposed by the release of the “Double Reduction” policy on Chinese education stocks, including A-shares, H-shares, and China Concept Stocks listed on the U.S. market. In addition to simply calculating the immediate stock price change on the issue day, this paper utilizes the event study methodology, which was first introduced by Fama, Fisher, Jensen, and Roll (FFJR) (1969), to quantify the direction and magnitude of changes in security prices around the policy release day in a systematic way. Upon identifying abnormal returns through event study, this paper further uses logistic regression to evaluate the causal effect of stock features, such as market cap, on the generation of abnormal returns.

1. **Methodology**

The first and primary part of this paper uses the event study methodology to measure the effect of the release of the “Double Reduction” policy on selected stocks mentioned above. The methodology was introduced by Fama, Fisher, Jensen, and Roll in 1969. It has become the standard approach for examining the impact of an event on the stock price and evaluating market reactions to new information. In an event study, the impact of the event is appraised by the abnormal return. The abnormal return is defined as the difference between the stock’s actual ex-post return and the company’s normal return over the period affected by the event. For firm and event date , the abnormal return is then measured as

where , , and represent the abnormal returns, actual returns, and normal returns respectively. This paper follows the procedure for an event study stated by A. Craig MacKinlay in “Event Studies in Economics and Finance” to conduct the analysis. It contains five steps following: 1) define the event and identify the event window over which the stock prices of companies involved in this event will be examined, 2) specify the selection criteria for stocks involved in the event, 3) determine the measure of abnormal return and normal return, 4) choose the estimation window to estimate parameters for normal return and thus calculate the abnormal return, 5) define the null hypothesis and determine the techniques for aggregating the individual firm abnormal returns to test for abnormal returns (MacKinlay 14-15).

The event this paper focuses on is the release of the “Double Reduction” policy. Selection criteria and a detailed list of stocks involved are clarified in the following section about data. This paper will use the Market Model to measure normal return, the expected performance of security without conditioning on the event happening. For security , the market model is

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where is the period-t returns on security , and is the period-t returns on the market portfolio. The estimation window is selected from 210 trading days before the event day to 21 trading days before the event to avoid the overlap with event window. This paper uses ordinary least squares (OLS) as the estimation procedure for the market model. The sample abnormal return is then calculated as

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Here, only measures the abnormal return of security on day . In order to study the overall impact of the event on stock pricing, it is necessary to calculate the Average Abnormal Return (AAR) and Cumulative Abnormal Return (CAR) to get the aggregated result. AAR is the average the abnormal return of all companies at a certain event date,

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where is a certain time in the event window period, and refers to the number of companies. CAR is the sum of the abnormal return of company throughout the event window,

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In addition, Cumulative Average Abnormal Return (CAAR) is also included to measure the overall effect of a group of securities across the event period,

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Here, and refer to the start day and the end day of the event window respectively.

After obtaining the CARs and CAARs, the final step is to test whether they are statistically different from zero, so as to determine whether the event had a significant impact on the prices of individual stocks and the whole portfolio. In the testing procedure, this paper assumes securities returns are normally distributed and heteroscedastic across the estimation window and the event windows. It is the most commonly used method to evaluate the statistical significance of CAR and CAAR according to Fausto Pacicco, Luigi Vena, and Andrea Venegoni (2017).

After conducting a typical event study, the next part of this paper involves a logistic regression to evaluate if there exist any factors that are influential to the generation of abnormal returns. The dependent variable is a dummy variable about whether the stock has an abnormal return. Securities with CARs that are statistically significantly different from zero at the significance level of 0.05 are assigned with a value of 1 and others with a value of 0. The independent variables are stock features collected from Wind that is elaborated on in the following section.

1. **Data**

The primary dataset this paper works with is the daily return of A-shares, H-shares, and China concept stocks related to the education industry. The selection is based on education concept stocks on Hithink Flush iFind terminal, a leading one-stop platform for Chinese financial data and information. Given that this paper focuses on evaluating abnormal returns around the event, companies that went public later than July 2021 are excluded. The data is collected from 1 January 2020 to 31 December 2021 to cover at least 210 trading days before the event day to estimate normal return and sufficient data points for post-event analysis. As to estimation of market returns, this paper uses the daily return of the CSI 300 Index as a proxy for A-share market movement, Hang Seng Index for H-share market movement, and S&P 500 Index for U.S. market movement.

Table 1: Selected A-Share education stocks

|  |  |  |  |
| --- | --- | --- | --- |
| **Ticker Symbol** | **Stock Name** | **English Abbreviation** | **Variable Name** |
| 300688.SZ | 创业黑马 | DARKHORSE | darkhorse |
| 600455.SH | 博通股份 | BUT'ONE | botong |
| 300359.SZ | 全通教育 | QTJY | qtone |
| 600880.SH | 博瑞传播 | B-RAYMEDIA | bray |
| 300010.SZ | 豆神教育 | DOUSHEN | doushen |
| 603377.SH | 东方时尚 | DFSS | easternpioneer |
| 600730.SH | 中国高科 | CHINA HI-TECH | chinahitech |
| 300089.SZ | 文化长城 | GREAT WALL CULTURE | greatwallculture |
| 002638.SZ | 勤上股份 | KINGSUN SHARE | kingsun |
| 600636.SH | 国新文化 | 3FNM | chinareformculture |
| 002261.SZ | 拓维信息 | TALKWEB | talkwebinformation |
| 300192.SZ | 科德教育 | KINGSWOOD EDUCATION | kingswoodinks |
| 605098.SH | 行动教育 | ACTION EDUCATION | actioneducation |
| 000526.SZ | 学大教育 | XUEDA | xueda |
| 300282.SZ | 三盛教育 | IRTOUCH | sansheng |
| 003032.SZ | 传智教育 | CHUANZHI EDUCATION | chuanzhi |
| 002607.SZ | 中公教育 | OFFCN EDU | offcn |
| 300338.SZ | 开元教育 | CKIC | kaiyuan |
| 600661.SH | 昂立教育 | SXN | only |
| 002659.SZ | 凯文教育 | KAIWEN EDUCATION | kaiwen |
| 002621.SZ | 美吉姆 | MY GYM | mygym |

Table 2: Selected H-Share education stocks

|  |  |  |  |
| --- | --- | --- | --- |
| **Ticker Symbol** | **Stock Name** | **English Abbreviation** | **Variable Name** |
| 0667.HK | 中国东方教育 | CHINA EAST EDU | eastedu |
| 0700.HK | 腾讯控股 | TENCENT | tencent |
| 0777.HK | 网龙 | NETDRAGON | netdragon |
| 0811.HK | 新华文轩 | XINHUA WINSHARE | xinhuawinshare |
| 0839.HK | 中教控股 | CHINA EDU GROUP | chinaeducation |
| 1082.HK | 香港教育国际 | HK EDU INTL | moderneducation |
| 1269.HK | 首控集团 | FIRST CAP GP | firstcapital |
| 1317.HK | 枫叶教育 | MAPLELEAF EDU | mapleleaf |
| 1449.HK | 立德教育 | LEADER EDU | leaderedu |
| 1525.HK | 建桥教育 | GENCH EDU | genchedu |
| 1565.HK | 成实外教育 | VIRSCEND EDU | virscend |
| 1569.HK | 民生教育 | MINSHENG EDU | minsheng |
| 1593.HK | 辰林教育 | CHEN LIN EDU | chenlin |
| 1598.HK | 21世纪教育 | 21CENTURY EDU | stcenturyedu |
| 1752.HK | 澳洲成峰高教 | TOP EDUCATION | topedu |
| 1758.HK | 博骏教育 | BOJUN EDU | bojun |
| 1765.HK | 希望教育 | HOPE EDU | hope |
| 1769.HK | 思考乐教育 | SCHOLAR EDU | scholaredu |
| 1773.HK | 天立教育 | TIANLI EDU | tianli |
| 1775.HK | 精英汇集团 | BEXCELLENT GP | bexcellentgroup |
| 1797.HK | 新东方在线 | KOOLEARN | koolearn |
| 1851.HK | 银杏教育 | GINGKO EDU | gingko |
| 1871.HK | 向中国际 | CHINA ORIENTED | chinaoriented |
| 1890.HK | 中国科培 | CHINA KEPEI | kepei |
| 1935.HK | 嘉宏教育 | JH EDUCATION | jiahong |
| 1969.HK | 中国春来 | CHINA CHUNLAI | chunlai |
| 2001.HK | 新高教集团 | NEW HIGHER EDU | newhigher |
| 2371.HK | 创联控股 | CHUANGLIAN HOLD | chuanglian |
| 2779.HK | 中国新华教育 | CH XINHUA EDU | xinhuaedu |
| 3978.HK | 卓越教育集团 | BESTSTUDY EDU | beststudy |
| 6068.HK | 光正教育 | WISDOM EDU INTL | wisdomeducation |
| 6169.HK | 宇华教育 | YUHUA EDU | yuhua |
| 8055.HK | 中国网络信息科技 | CHI E-INFO TECH | chinaeinfotech |
| 8067.HK | 东方大学城控股 | OUC HOLDINGS | oucholdings |
| 8206.HK | 神通机器人教育 | S ROBOT EDU | shentongrobot |
| 8363.HK | SDM教育 | SDM EDUCATION | sdmedu |
| 8417.HK | 大地教育 | DADI EDU | dadi |
| 9616.HK | 东软教育 | NEUSOFT EDUCATION | neusoft |
| 9901.HK | 新东方-S | NEW ORIENTAL-S | neworiental |
| 9986.HK | 大山教育 | DASHAN EDU | dashaneducation |

Table 3: Selected education China Concept Stocks

|  |  |  |
| --- | --- | --- |
| **Ticker Symbol** | **Stock Name** | **Variable Name** |
| AACG.O | ATA CREATIVITY GLOBAL | aacgo |
| AMBO.A | AMBOW EDUCATION | amboa |
| BEDU.N | BRIGHT SCHOLAR EDUCATION | bedun |
| CLEU.O | CHINA LIBERAL EDUCATION | cleuo |
| COE.N | CHINA ONLINE EDUCATION | coen |
| CSCW.O | COLOR STAR TECHNOLOGY | cscwo |
| DAO.N | YOUDAO | daon |
| EDTK.O | SKILLFUL CRAFTSMAN EDUCATION | edtko |
| EDU.N | NEW ORIENTAL | edun |
| FEDU.N | FOUR SEASONS EDUCATION (CAYMAN) | fedun |
| FHS.N | FIRST HIGH-SCHOOL EDUCATION | fhsn |
| GOTU.N | GAOTU TECHEDU | gotun |
| HLG.O | HAILIANG EDUCATION | hlgo |
| IH.N | IHUMAN | ihn |
| LAIX.N | LAIX | laixn |
| LXEH.O | LIXIANG EDUCATION | lxeho |
| METX.O | METEN | metxo |
| NEW.N | PUXIN | newn |
| ONE.N | ONESMART INTERNATIONAL EDUCATION | onen |
| REDU.O | RISE EDUCATION CAYMAN | reduo |
| RYB.N | RYB EDUCATION | rybn |
| STG.N | SUNLANDS TECHNOLOGY | stgn |
| TAL.N | TAL EDUCATION | taln |
| TEDU.O | TARENA INTERNATIONAL | teduo |
| WAFU.O | WAH FU EDUCATION | wafuo |
| YQ.O | 17 EDUCATION & TECHNOLOGY | yqo |
| ZCMD.O | ZHONGCHAO | zcmdo |
| ZME.N | ZHANGMEN EDUCATION | zmen |

In addition, this paper also uses the daily return of companies that are irrelevant to the education industry, including agriculture, finance, and retail industry, to validate that the abnormal returns deduced through event study is triggered by the "Double Reduction" policy, rather than other macroeconomic events with wide-ranging effects across different industries. Moreover, features of stocks are also collected to further investigate the conditions under which abnormal returns can occur. It typically includes market cap on 5 July 2021 as a proxy for the company’s equity value before the event, PE ratio (TTM), and ROE in the financial year 2020.

1. **Empirical Results**
   1. **Event study group by main business**
      1. **A-share**

Table 4: CAR and CAAR of A-shares in regular event window

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **SECURITY** | **CAAR[-1,1]** | **CAAR[-5,5]** | **CAAR[-10,10]** | **CAAR[-10,0]** | **CAAR[0,10]** |
| Doushen | -37.4098%\*\*\* | -16.5998% | -6.3898% | -16.2699% | -10.6773% |
| Kingswood Inks | -25.1418%\*\*\* | -14.1958% | -10.0904% | -17.2792% | -4.3137% |
| Xueda | -22.2013%\*\*\* | -30.3650%\*\*\* | -27.5302%\* | -16.3912% | -19.2296%\* |
| Only | -22.4110%\*\*\* | -18.2534%\*\*\* | -18.1341%\*\* | -15.7715%\*\*\* | -11.5937%\*\* |
| Kingsun | -25.1973%\*\*\* | -29.1037%\*\*\* | -33.1752%\*\* | -22.6295%\*\* | -20.9097%\*\* |
| Ptf CARs n 1 (5 securities) | -26.5391%\*\*\* | -21.6085%\*\*\* | -18.8517%\*\* | -17.6683%\*\*\* | -13.1112%\*\* |
| CAAR group 1 (5 securities) | -26.3627%\*\*\* | -21.1628%\*\*\* | -18.0650%\*\*\* | -17.2605%\*\*\* | -12.6564%\*\*\* |
| B-ray | -7.1825%\*\* | -5.9404% | -1.6214% | -5.6610% | -1.7801% |
| Sansheng | -14.3999%\*\* | -7.4854% | -2.8089% | -8.0708% | -2.2564% |
| Kaiwen | -12.7560%\*\*\* | -6.7451% | -6.1138% | -13.8770% | -1.9735% |
| Mygym | -17.1364%\*\*\* | -4.8237% | -10.7772% | -12.9935% | -7.1663% |
| Ptf CARs n 2 (4 securities) | -12.8871%\*\*\* | -6.1756% | -5.3480% | -10.2777% | -3.1913% |
| CAAR group 2 (4 securities) | -12.8336%\*\*\* | -5.9726% | -4.9646% | -10.0787%\*\* | -2.9879% |
| Dark Horse | -3.8952% | -3.2662% | -5.1559% | -3.4427% | -7.1555% |
| Botong | -1.4840% | -1.3728% | 1.6391% | -1.5353% | 2.5505% |
| Eastern Pioneer | -12.6212%\*\* | -7.1403% | -9.3454% | -0.0737% | -14.9161% |
| China Hi-Tech | 0.8215% | 4.2674% | 4.2592% | -1.6197% | 3.7318% |
| Great Wall Of Culture | -11.2822%\*\* | -10.4664% | -23.9862% | -9.4747% | -14.9315% |
| Action Education | -9.5566% | -25.9966% | -32.9113% | -11.6565% | -21.4667% |
| Chuanzhi | -20.7148%\*\* | -26.7126% | -36.1703% | -33.4850%\* | -9.0347% |
| Offcn | -13.5490%\*\* | -15.1908% | -29.6443%\* | -24.8807%\*\* | -11.7884% |
| Kaiyuan | -15.0929%\*\*\* | -2.5510% | 24.8009% | 0.0432% | 16.3934% |
| Ptf CARs n 3 (9 securities) | -9.4734%\*\*\* | -8.5287%\* | -9.1188% | -8.2799%\* | -4.8017% |
| CAAR group 3 (9 securities) | -9.5473%\*\*\* | -9.3731%\*\* | -10.8493%\* | -9.1373%\*\* | -5.6926% |
| Qtone | -15.5556%\*\*\* | -13.1076% | -12.0831% | -11.7353% | -14.5537% |
| China Reform Culture | 4.9178% | 1.9414% | -0.3799% | 7.3885% | 3.1615% |
| Talkweb Information | -3.9276% | -13.2352% | -18.1396% | -13.2679% | -7.6005% |
| Ptf CARs n 4 (3 securities) | -4.3824% | -7.6883% | -9.7724% | -5.3523% | -5.9400% |
| CAAR group 4 (3 securities) | -4.2925% | -7.4471% | -9.3337% | -5.1042% | -5.7021% |
| \*\*\* p-value < .01, \*\* p-value <.05, \* p-value <.1 | | | | | |

There are in total 21 A-share education stocks selected as companies involved in the “Double Reduction” Policy. The stocks are divided into 4 groups based on their main business: 1) K-12 off-campus curriculum subject-tutoring, 2) other K-12 education services, including private secondary schools, international schools, art training, and early childhood education, 3) non-K-12 education services, including vocational education, driving schools, enterprise training, 4) technical support and equipment provider, including campus digitalization SaaS, exam assessment services, recording software and hardware for educational purpose. Nearly half of A-share education stocks are non-K-12 education services, and only 5 companies are directly related to K-12 off-campus curriculum subject-tutoring.

Table 4 above indicates that the release of the "Double Reduction" policy affected the A-share education stocks in a negative way. In a short-term event window [-1,1], which means from one trading day before the event date to one trading day after the event date, K-12 curriculum subject-tutoring companies suffered the largest statistically significant negative abnormal return, followed by other K-12 education service providers and non-K-12 education service providers. Although one technical support and equipment provider company yields a significant negative abnormal return, the aggregation abnormal return for the whole group is not statistically significant. If a longer event window is chosen, only K-12 curriculum subject-tutoring companies continue to show a statistically significant negative abnormal return.

Such results are consistent with the target of the “Double Reduction” policy. The policy aims at reducing the burden of compulsory education on students’ homework and off-campus training. The regulation of operating on a non-profit basis and not being allowed to go public are restricted to K-12 off-campus curriculum subject-tutoring, rather than all education companies. The policy also asks compulsory education schools to provide high-quality online teaching resources to students for free. This is good news for companies providing online education solutions and campus informatization services, which explains why there is no significant negative impact on the group of technical support and equipment providers.

Table 5: CAR and CAAR of A-shares in wide-span event window

|  |  |  |  |
| --- | --- | --- | --- |
| **SECURITY** | **CAAR[-20,0]** | **CAAR[0,20]** | **CAAR[0,30]** |
| Doushen | -21.3497% | 21.9558% | 13.7975% |
| Kingswood Inks | -14.5331% | 12.2571% | 6.3001% |
| Xueda | -17.0902% | -8.8356% | -4.2231% |
| Only | -19.9329%\*\* | 2.7767% | 4.3386% |
| Kingsun | -28.6346%\*\* | -21.4138% | -24.4037% |
| Ptf CARs n 1 (5 securities) | -20.3327%\*\* | 1.8502% | -0.4309% |
| CAAR group 1 (5 securities) | -19.5870%\*\*\* | 2.7207% | 0.7607% |
| B-ray | -6.8031% | -2.9498% | 3.8000% |
| Sansheng | 0.9737% | 4.6310% | 4.5428% |
| Kaiwen | -10.3692% | 6.7940% | 14.1551% |
| Mygym | -17.5692% | -0.4166% | -3.2394% |
| Ptf CARs n 2 (4 securities) | -8.6428% | 2.0094% | 4.7203% |
| CAAR group 2 (4 securities) | -8.2619% | 2.3942% | 5.2834% |
| Dark Horse | -4.2545% | 3.8531% | 84.0440%\*\*\* |
| Botong | 1.0398% | 9.9597% | 16.3402% |
| Eastern Pioneer | -1.2509% | -9.1848% | -10.1270% |
| China Hi-Tech | 2.5421% | 12.5646% | 46.2027%\*\*\* |
| Great Wall Of Culture | -9.4738% | -30.1822%\*\* | -10.7679% |
| Action Education | -1.0157% | -23.8714% | -23.4912% |
| Chuanzhi | -43.5788% | -15.5587% | -35.7798% |
| Offcn | -34.3992%\*\* | -15.2538% | -15.6701% |
| Kaiyuan | 3.4437% | 20.5615% | 24.9592% |
| Ptf CARs n 3 (9 securities) | -7.1678% | -2.4399% | 13.7228% |
| CAAR group 3 (9 securities) | -8.8440% | -4.1207% | 11.1517% |
| Qtone | -0.7458% | -6.1127% | -10.1570% |
| China Reform Culture | 12.7041% | 30.9915%\*\*\* | 23.3327%\* |
| Talkweb Information | 5.2175% | -10.7580% | -7.2149% |
| Ptf CARs n 4 (3 securities) | 6.5035% | 5.1978% | 2.4702% |
| CAAR group 4 (3 securities) | 6.9334% | 5.6498% | 3.1095% |
| \*\*\* p-value < .01, \*\* p-value <.05, \* p-value <.1 | | | |

Moreover, although the implementation of the double reduction policy resulted in a slump in education stocks, its negative impact has not been as lasting and complete as one might think. Except for K-12 off-campus curriculum subject-tutoring companies, all other education-related companies basically do not reveal statistically significant negative abnormal returns within 10 trading days after the event. In fact, within 20 trading days after the event, even K-12 off-campus curriculum subject-tutoring companies have stopped slumping with no significant negative abnormal returns and continued to move with the market. This may be due to the active response of these companies immediately after the policy was introduced. For example, Doushen Education announced that the company would mitigate the pressure of this policy by expanding multiple business lines, such as Doushen Aesthetic Education and smart education to explore diversified business cooperation models with public schools (Zhao, Xinhua Net).

Someone may question if these abnormal returns were actually caused by the release of the “Double Reduction” policy. What if some other events accidentally happened on the same day, or during a period nearby, that led to a slump in not only the education sector, but other industries as well? Therefore, it is necessary to investigate the performance of stocks irrelevant to education during the same event window. In this case, the agriculture, retail, and finance industry are chosen to conduct the validation.

Table 6: CAR and CAAR of agriculture stocks in regular event window

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **SECURITY** | **CAAR[-1,1]** | **CAAR[-5,5]** | **CAAR[-10,10]** | **CAAR[-10,0]** | **CAAR[0,10]** |
| lpht | 8.7357%\*\* | 24.4743%\*\*\* | 35.4722%\*\*\* | 13.1039%\* | 26.6254%\*\*\* |
| denghai seeds | 4.9637% | 10.1365% | 19.5336% | 6.7569% | 14.2383% |
| zhongxing biotech | -12.9000%\*\* | -17.0976%\* | -20.9156% | -4.9941% | -22.6482%\*\* |
| winall hi-tech | 14.0055%\* | 33.4952%\*\* | 23.2910% | 12.5671% | 14.2724% |
| shennong technology | 5.1712% | 14.2639% | 14.6919% | 8.9297% | 5.3589% |
| xuerong | -3.3868% | -1.7819% | -4.5665% | 11.9805% | -17.4596%\* |
| chinagreen | -7.1981% | 1.1264% | -15.2781% | -21.6691% | 7.4360% |
| vanchen mushrooms | 1.0071% | 5.8953% | 14.2225% | 2.8420% | 12.1796% |
| yasheng group | 7.4418%\*\* | 15.9711%\*\* | 11.5385% | 9.4580% | 6.3540% |
| nfsi | 14.2842%\*\*\* | 13.5696% | 15.8281% | 6.0194% | 12.8986% |
| dunhuang seed | -12.3599%\*\* | -11.0241% | -10.0015% | 3.9146% | -19.2950%\*\* |
| xtad | 4.8349% | 0.4714% | 7.2279% | 5.0363% | 3.4827% |
| wanxiang doneed | 8.7046%\*\* | 12.9900% | 10.5581% | 4.7336% | 8.4652% |
| xlgf | -2.7558% | 1.9191% | 4.9632% | 4.7476% | -0.7698% |
| xinsai | 10.7471% | 7.7754% | 7.2907% | 6.2205% | 3.9094% |
| hacl | 6.5276%\*\* | 9.8690%\* | 6.2144% | 5.1314% | 5.3840% |
| hainan rubber group | 1.6646% | -2.8316% | -0.9531% | -2.7408% | 1.7415% |
| Ptf CARs n 1 (17 securities) | 3.1856% | 6.6859% | 6.0696% | 3.8205% | 3.2520% |
| CAAR group 1 (17 securities) | 3.0721%\*\* | 7.5000%\*\*\* | 7.8151%\*\* | 4.6143%\* | 4.1353%\* |
| \*\*\* p-value < .01, \*\* p-value <.05, \* p-value <.1 | | | | | |

Table 7: CAR and CAAR of finance stocks in regular event window

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **SECURITY** | **CAAR[-1,1]** | **CAAR[-5,5]** | **CAAR[-10,10]** | **CAAR[-10,0]** | **CAAR[0,10]** |
| Ptf CARs n 1 (123 securities) | 1.0352% | -0.3725% | 0.5236% | 1.7358%\*\*\* | -1.5968%\*\* |
| CAAR group 1 (123 securities) | 1.0703%\*\*\* | -0.2013% | 0.8682% | 1.9216%\*\*\* | -1.4294%\*\* |
| \*\*\* p-value < .01, \*\* p-value <.05, \* p-value <.1 | | | | | |

Table 8: CAR and CAAR of retail stocks in regular event window

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **SECURITY** | **CAAR[-1,1]** | **CAAR[-5,5]** | **CAAR[-10,10]** | **CAAR[-10,0]** | **CAAR[0,10]** |
| Ptf CARs n 1 (96 securities) | -2.8306%\* | -3.3304% | -2.6996% | -2.7894% | -0.6995% |
| CAAR group 1 (96 securities) | -2.8270%\*\*\* | -3.1147%\*\*\* | -2.2553%\* | -2.5734%\*\*\* | -0.4753% |
| \*\*\* p-value < .01, \*\* p-value <.05, \* p-value <.1 | | | | | |

From Tables 6, 7, and 8 above, both the agriculture industry and finance industry reveal a statistically significant positive abnormal return. Although the retail companies yield a statistically significant negative abnormal return, the scale is relatively small compared to that of the education stocks. Meanwhile, given that the retail sector includes many large department stores and shopping malls, in which many K-12 off-campus curriculum subject-tutoring companies chose to have their offline service, the release of the “Double Reduction” policy could lead to a negative impact on their stock prices indirectly. In this case, it is at least reasonable to state that there were no macroeconomic events with sweeping influence across industries that happened near the issue day. It is appropriate to attribute the abnormal returns of education stocks to the release of the “Double Reduction” policy.

* + 1. **H-share**

There are in total 40 H-share education stocks selected as companies involved in the “Double Reduction” Policy. The stocks are divided into 4 groups following the same criteria. Similar to the distribution in A-shares, almost half of H-share education stocks are non-K-12 education services, and only 8 companies are directly related to K-12 off-campus curriculum subject-tutoring.

Table 9: CAR and CAAR of H-shares in regular event window

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **SECURITY** | **CAAR[-1,1]** | **CAAR[-5,5]** | **CAAR[-10,10]** | **CAAR[-10,0]** | **CAAR[0,10]** |
| Dashan Education | -16.2142%\*\* | -7.0817% | -8.4783% | -15.3144%\*\* | -0.6432% |
| Koolearn | -55.3344%\*\*\* | -17.8407%\*\*\* | -19.0432%\*\*\* | -52.2054%\*\*\* | 3.4253% |
| Tencent | -5.0055% | -6.6381% | -7.8172% | -2.7029% | -6.9049% |
| BExcellent Group | 0.6666% | -3.3031% | -0.5834% | -6.3280% | 2.7267% |
| Beststudy | -77.9867%\*\*\* | -59.3321%\*\*\* | -66.2440%\*\*\* | -48.3681%\*\*\* | -59.4702%\*\*\* |
| Modern Education | -4.4428% | -7.4204% | -11.7178%\* | -8.1707% | -7.2003% |
| New Oriental | -89.3622%\*\*\* | -72.8838%\*\*\* | -63.7939%\*\*\* | -74.2867%\*\*\* | -33.7530%\*\*\* |
| Scholar Edu | -56.9433%\*\*\* | 18.4884%\*\*\* | 10.9863%\* | -42.4666%\*\*\* | 11.9058%\* |
| Ptf CARs n 1 (8 securities) | -35.2653%\*\*\* | -15.4148%\*\* | -17.0881%\*\*\* | -28.5934%\*\*\* | -8.5134% |
| CAAR group 1 (8 securities) | -35.1574%\*\*\* | -14.7439%\*\*\* | -15.7328%\*\* | -27.9271%\*\*\* | -7.8100%\* |
| Wisdom education | -12.5356%\* | -3.3700% | -2.4551% | -15.8748%\*\* | 1.0015% |
| First Capital | 10.0264% | 12.0331%\* | 10.3142% | 6.0698% | 7.2144% |
| Maple Leaf | -12.3124%\* | -5.4821% | -7.2152% | -8.4475% | -4.8542% |
| Virscend | -10.8392%\* | -13.5066%\*\* | -27.3635%\*\*\* | -11.6475%\* | -23.9813%\*\*\* |
| Tianli | -29.7267%\*\*\* | -2.0794% | 2.3422% | -22.0384%\*\*\* | 1.1516% |
| Bojun | 9.9397% | -4.9536% | -27.0167%\*\*\* | -1.1258% | -21.6845%\*\*\* |
| Dadi | -16.7885%\*\* | -11.2936%\* | 0.0894% | 3.7204% | -9.7445% |
| Yu Hua | -24.2146%\*\*\* | -16.0304%\*\* | -27.3976%\*\*\* | -29.5402%\*\*\* | -15.0180%\*\* |
| Shentong Robot | 9.8372% | -2.4269% | -16.1913%\*\* | -1.0382% | -14.8674%\*\* |
| SDM Edu | -2.8042% | 8.6923% | -4.2253% | -16.1417%\*\* | 10.6546% |
| Ptf CARs n 2 (10 securities) | -7.4710% | -2.5000% | -9.2389% | -8.3661% | -7.1502% |
| CAAR group 2 (10 securities) | -7.4480%\*\* | -1.5859% | -7.0744% | -7.3934% | -6.0390% |
| China Oriented | -4.1534% | -2.6087% | -10.4951% | -4.5422% | -6.5662% |
| Chunlai | 5.9744% | 3.8170% | 5.7644% | -0.5717% | 3.7649% |
| Xinhua Edu | -17.7805%\*\*\* | -3.1180% | -17.3886%\*\*\* | -15.1117%\*\* | -12.8544%\* |
| Chuanglian | -6.1157% | -18.2547%\*\*\* | -37.6846%\*\*\* | -7.9766% | -27.5376%\*\*\* |
| China Education | -18.7994%\*\*\* | -8.9911% | -11.8092%\* | -22.7368%\*\*\* | -2.1100% |
| Chen Lin | -6.3713% | -1.0097% | -2.5566% | -3.6946% | -2.6855% |
| China E-Info Tech | 4.9085% | -10.1949% | 27.5036%\*\*\* | 33.9744%\*\*\* | -6.8033% |
| Hope | -21.5334%\*\*\* | -6.7388% | -9.7330% | -20.0466%\*\*\* | -4.3464% |
| Gingko | -5.5683% | -4.6745% | 0.7074% | -2.8150% | 0.4181% |
| Leader Edu | -10.8130% | -7.9228% | -20.4458%\*\*\* | -5.3002% | -19.2887%\*\*\* |
| Jia Hong | -5.0180% | -2.5389% | -4.1316% | -2.3250% | -4.5945% |
| Kepei | -23.6697%\*\*\* | -8.9150% | -11.3908%\* | -15.7695%\*\* | -11.6327%\* |
| East Edu | -4.9654% | -3.2840% | -14.1232%\*\* | -17.1620%\*\*\* | -0.8730% |
| Neusoft | -2.3166% | 1.4969% | -1.7644% | -2.5766% | 0.2287% |
| New Higher | -19.9312%\*\*\* | -5.3308% | -9.0889% | -20.2441%\*\*\* | 3.2611% |
| 21st Century Edu | -51.0328%\*\*\* | -16.6779%\*\* | -0.5028% | -19.8555%\*\*\* | -0.0784% |
| Gench Edu | -12.7236%\* | -13.7334%\*\* | -15.5915%\*\* | -9.1123% | -12.1910%\* |
| Min Sheng | -9.1142% | -1.6283% | -4.5187% | -18.0461%\*\*\* | 5.8920% |
| Top Edu | -7.9058% | 12.9468%\*\* | 25.8431%\*\*\* | 10.3253% | 17.2173%\*\*\* |
| Ptf CARs n 3 (19 securities) | -11.1093%\* | -4.7497% | -5.6114% | -7.5698% | -3.8322% |
| CAAR group 3 (19 securities) | -10.9384%\*\*\* | -4.1102% | -4.3682% | -6.9654%\*\* | -3.1686% |
| NetDragon | -8.1814% | 3.5727% | -8.1778% | 1.1674% | -10.9661%\* |
| OUC Holdings | -13.0746%\*\* | -29.1605%\*\*\* | -28.9627%\*\*\* | -9.8990% | -21.9053%\*\*\* |
| Xinhua Winshare | -0.6941% | -3.9499% | -6.1553% | -3.6797% | -4.5062% |
| Ptf CARs n 4 (3 securities) | -7.2722% | -9.7922% | -14.6086%\*\* | -4.4380% | -12.3483%\* |
| CAAR group 4 (3 securities) | -7.2025%\*\* | -9.5069% | -13.9521% | -4.0667% | -12.0485%\* |
| \*\*\* p-value < .01, \*\* p-value <.05, \* p-value <.1 | | | | | |

Table 10: CAR and CAAR of H-shares in wide-span event window

|  |  |  |  |
| --- | --- | --- | --- |
| **SECURITY** | **CAAR[-20,0]** | **CAAR[0,20]** | **CAAR[0,30]** |
| Dashan Education | -5.0108% | -10.6861% | -22.6346%\*\*\* |
| Koolearn | -57.2371%\*\*\* | -8.0372% | 36.9380%\*\*\* |
| Tencent | -2.4117% | -5.9975% | 4.0768% |
| BExcellent Group | -4.8373% | -3.2343% | -5.6251% |
| Beststudy | -46.7728%\*\*\* | -44.3240%\*\*\* | -21.4992%\*\*\* |
| Modern Education | 6.3745% | -4.1320% | -6.6280% |
| New Oriental | -87.7434%\*\*\* | -41.1551%\*\*\* | -11.6640%\* |
| Scholar Edu | -51.0796%\*\*\* | 9.4715% | 44.0029%\*\*\* |
| Ptf CARs n 1 (8 securities) | -28.6938%\*\*\* | -11.0801%\* | 4.6866% |
| CAAR group 1 (8 securities) | -27.4082%\*\*\* | -9.7284% | 6.7490% |
| Wisdom education | -14.1008%\*\* | -5.2672% | 8.0544% |
| First Capital | 9.8756% | 27.4691%\*\*\* | 17.4972%\*\*\* |
| Maple Leaf | -9.3268% | -1.2417% | 9.9088% |
| Virscend | -13.3571%\*\* | -13.9243%\*\* | -15.8528%\*\* |
| Tianli | -24.5359%\*\*\* | -3.5436% | 24.5407%\*\*\* |
| Bojun | 22.7657%\*\*\* | -25.9927%\*\*\* | -29.6207%\*\*\* |
| Dadi | -6.6104% | -16.0595%\*\* | -3.3695% |
| Yu Hua | -38.0531%\*\*\* | -24.4538%\*\*\* | -26.8871%\*\*\* |
| Shentong Robot | -2.6299% | -8.7654% | 9.1667% |
| SDM Edu | 20.3928%\*\*\* | 3.2680% | 12.3761%\* |
| Ptf CARs n 2 (10 securities) | -4.1435% | -7.0590% | -0.3859% |
| CAAR group 2 (10 securities) | -2.1379% | -4.8545% | 3.0684% |
| China Oriented | 2.9839% | -1.5751% | -6.7035% |
| Chunlai | 0.8832% | 7.0925% | -1.6975% |
| Xinhua Edu | -17.7593%\*\*\* | -16.4575%\*\* | -11.9068%\* |
| Chuanglian | 4.8251% | -50.5152%\*\*\* | -49.1641%\*\*\* |
| China Education | -26.1314%\*\*\* | -8.6949% | -1.9233% |
| Chen Lin | -2.8371% | -6.3840% | -11.0499%\* |
| China E-Info Tech | 32.1520%\*\*\* | -8.7822% | -18.2419%\*\*\* |
| Hope | -26.0073%\*\*\* | -15.5476%\*\* | -5.2302% |
| Gingko | 5.9739% | 6.3461% | 4.9613% |
| Leader Edu | -1.7956% | -17.7038%\*\*\* | -12.1842%\* |
| Jia Hong | -17.1033%\*\*\* | -9.0739% | -0.1538% |
| Kepei | -7.2701% | -10.1628% | -4.9116% |
| East Edu | -38.5387%\*\*\* | -7.0744% | 9.9814% |
| Neusoft | -7.1464% | 3.8972% | -0.4859% |
| New Higher | -27.3533%\*\*\* | 0.1203% | 1.6815% |
| 21st Century Edu | -17.7894%\*\*\* | -8.5514% | -6.1105% |
| Gench Edu | -10.0011% | -2.7305% | -5.8356% |
| Min Sheng | -14.1060%\*\* | 3.4167% | -0.6654% |
| Top Edu | -13.2601%\*\* | 6.7528% | -2.0538% |
| Ptf CARs n 3 (19 securities) | -9.6744% | -6.8586% | -6.3463% |
| CAAR group 3 (19 securities) | -8.4951%\*\* | -5.6109% | -4.5238% |
| NetDragon | -0.4238% | -13.3043%\*\* | 5.3329% |
| OUC Holdings | -21.6671%\*\*\* | -58.9916%\*\*\* | -43.4107%\*\*\* |
| Xinhua Winshare | -5.2302% | -3.8463% | 3.9690% |
| Ptf CARs n 4 (3 securities) | -9.7319% | -24.3808%\*\*\* | -10.1709% |
| CAAR group 4 (3 securities) | -8.9743% | -23.7203%\*\* | -9.1552% |
| \*\*\* p-value < .01, \*\* p-value <.05, \* p-value <.1 | | | |

No matter whether the event window is narrow or wide, H-share education stocks demonstrate a similar pattern to A-shares. The negative abnormal returns of K-12 off-campus curriculum subject-tutoring companies are considerably higher than those of other companies, and still statistically significant within 5 and 10 trading days around the event day. Every group of securities shows no strong evidence of a long-term slump below the market movement.

Table 11: CAR and CAAR of H-shares in left-skewed event window

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **SECURITY** | **CAAR[-1,0]** | **CAAR[-3,0]** | **CAAR[-5,0]** | **CAAR[-7,0]** | **CAAR[-9,0]** |
| Dashan Education | -11.1320%\* | -9.8418% | -11.5576%\* | -14.0180%\*\* | -16.6245%\*\* |
| Koolearn | -56.0618%\*\*\* | -40.9216%\*\*\* | -48.1791%\*\*\* | -54.6359%\*\*\* | -50.8901%\*\*\* |
| Tencent | -2.0817% | -4.1719% | -4.1360% | -3.8411% | -1.0990% |
| BExcellent Group | -2.4131% | -3.5658% | -2.4699% | -3.1480% | -2.9279% |
| Beststudy | -62.4597%\*\*\* | -52.7725%\*\*\* | -51.5340%\*\*\* | -52.9355%\*\*\* | -49.6099%\*\*\* |
| Modern Education | -4.4079% | -5.5156% | -7.0168% | -6.2698% | -6.7480% |
| New Oriental | -83.5595%\*\*\* | -72.8732%\*\*\* | -85.2641%\*\*\* | -85.9914%\*\*\* | -77.5243%\*\*\* |
| Scholar Edu | -68.1620%\*\*\* | -32.4274%\*\*\* | -36.8044%\*\*\* | -43.1369%\*\*\* | -41.8551%\*\*\* |
| Ptf CARs n 1 (8 securities) | -33.6559%\*\*\* | -24.8316%\*\*\* | -27.9923%\*\*\* | -30.1982%\*\*\* | -28.2166%\*\*\* |
| CAAR group 1 (8 securities) | -33.6255%\*\*\* | -24.6256%\*\*\* | -27.6759%\*\*\* | -29.7497%\*\*\* | -27.6261%\*\*\* |
| Wisdom education | -16.1176%\*\* | -9.1910% | -12.4430%\* | -15.1666%\*\* | -14.0182%\*\* |
| First Capital | 5.0009% | 6.0879% | 11.9508%\* | 12.0371%\* | 13.9712%\*\* |
| Maple Leaf | -8.3082% | -4.3400% | -6.8420% | -8.7177% | -8.0911% |
| Virscend | -10.1462% | -5.6417% | -8.4562% | -9.0059% | -9.6807% |
| Tianli | -32.4994%\*\*\* | -22.8955%\*\*\* | -23.1051%\*\*\* | -27.9351%\*\*\* | -23.9312%\*\*\* |
| Bojun | 5.6429% | -8.0077% | 1.3031% | -5.8707% | -0.4230% |
| Dadi | -10.5148% | -32.8454%\*\*\* | -6.1316% | -6.4751% | -6.5929% |
| Yu Hua | -21.3942%\*\*\* | -18.6346%\*\*\* | -21.9371%\*\*\* | -26.0698%\*\*\* | -27.4665%\*\*\* |
| Shentong Robot | 4.1917% | -0.5128% | -0.0848% | 0.2356% | -2.9001% |
| SDM Edu | -1.5093% | -15.7612%\*\* | -8.5252% | -31.7951%\*\*\* | -30.4708%\*\*\* |
| Ptf CARs n 2 (10 securities) | -8.1389% | -10.3649% | -5.9430% | -10.5029% | -9.7678% |
| CAAR group 2 (10 securities) | -8.1502%\*\*\* | -10.1516%\*\*\* | -5.6390% | -9.9528%\*\* | -8.9382%\* |
| China Oriented | -0.3635% | 3.8543% | 2.6832% | -0.9010% | 1.8088% |
| Chunlai | -3.0996% | -3.9432% | -2.3460% | -2.6784% | -0.2753% |
| Xinhua Edu | -11.5548%\* | -7.2688% | -8.2349% | -8.5932% | -12.8245%\* |
| Chuanglian | -0.1698% | -3.3840% | -6.5471% | -6.0988% | -7.8420% |
| China Education | -16.9670%\*\* | -15.0425%\*\* | -17.9451%\*\*\* | -21.3957%\*\*\* | -22.5854%\*\*\* |
| Chen Lin | -6.4361% | -0.8803% | -4.2676% | -1.7545% | -7.5564% |
| China E-Info Tech | 5.2512% | 14.8038%\*\* | 3.6552% | 10.7097% | 21.1886%\*\*\* |
| Hope | -18.5246%\*\*\* | -11.7072%\* | -15.1365%\*\* | -16.1707%\*\* | -17.3391%\*\*\* |
| Gingko | -5.2156% | -2.0400% | -4.9238% | -4.2482% | -3.0526% |
| Leader Edu | -4.8035% | -6.1950% | -1.7729% | -2.8372% | -5.3843% |
| Jia Hong | -4.8537% | 0.8324% | -6.7706% | -0.1760% | -1.1769% |
| Kepei | -17.3111%\*\*\* | -12.3875%\* | -11.0921%\* | -15.9288%\*\* | -17.0603%\*\*\* |
| East Edu | -10.6866% | -8.9368% | -8.2174% | -18.1538%\*\*\* | -13.7686%\*\* |
| Neusoft | -4.1092% | -0.6347% | -0.6266% | -2.2027% | -2.3994% |
| New Higher | -15.0541%\*\* | -8.2212% | -13.1366%\*\* | -14.8955%\*\* | -17.7228%\*\*\* |
| 21st Century Edu | -22.6728%\*\*\* | -22.6385%\*\*\* | -22.5399%\*\*\* | -22.4976%\*\*\* | -21.5140%\*\*\* |
| Gench Edu | -5.4945% | -6.3011% | -8.5887% | -9.0509% | -9.0818% |
| Min Sheng | -10.2589% | -11.1718%\* | -9.5409% | -15.6587%\*\* | -18.8898%\*\*\* |
| Top Edu | 1.7419% | 5.2279% | 4.1226% | 2.6025% | 3.0157% |
| Ptf CARs n 3 (19 securities) | -7.7847% | -4.9718% | -6.8752% | -7.8773% | -8.0586% |
| CAAR group 3 (19 securities) | -7.7093%\*\*\* | -4.7814%\*\*\* | -6.5708%\*\*\* | -7.4542%\*\*\* | -7.5143%\*\*\* |
| NetDragon | -0.7200% | -0.5240% | 2.4420% | -0.6568% | -0.4418% |
| OUC Holdings | -3.4052% | -8.9956% | -10.0723% | -10.3616% | -9.8075% |
| Xinhua Winshare | -1.8973% | -3.4286% | -3.9690% | -4.7546% | -3.5645% |
| Ptf CARs n 4 (3 securities) | -2.0565% | -4.3686% | -3.9898% | -5.4538% | -4.8719% |
| CAAR group 4 (3 securities) | -2.0044% | -4.2696% | -3.8099% | -5.1966% | -4.5375% |
| \*\*\* p-value < .01, \*\* p-value <.05, \* p-value <.1 | | | | | |

Moreover, Table 10 indicates that the market was not surprised by the release of the double reduction policy. The education industry reveals negative abnormal returns within the event window of at least 20 trading days before the event date. Table 11 shows a more detailed breakdown that the CAAR in [-5,0] is larger in terms of scale compared with that during the event window of [-3,0]. In other words, although no official announcement has been made, the market already knew about the upcoming announcement of the “Double Reduction” policy and what detailed regulations it might involve.

Figure 1: Plot of H-share CAAR from event day -20 to event day -1

To have a deeper investigation of this information leaking effect, CAARs of H-share education stocks by main business from 20 trading days before the event date to 1 trading day before the event date are collected and plotted in Figure 1 above. It further demonstrates that the market may have already known that the “Double Reduction” policy was at the corner about one month ago, which led to a non-optimistic reaction to the stock prices before the actual release given that the CAARs of K-12 off-campus curriculum subject-tutoring companies remain negative below -25%.

Table 12: CAR and CAAR of H-shares grouped by location

|  |  |  |  |
| --- | --- | --- | --- |
| **SECURITY** | **CAAR[-1,1]** | **CAAR[-3,3]** | **CAAR[-10,10]** |
| BExcellent Group | -0.1256% | -5.1481% | 0.6073% |
| Dadi | -7.1484% | -32.9940%\*\*\* | 6.4033% |
| Modern Education | -3.7891% | -7.0369% | -11.0170%\* |
| SDM Edu | -1.7458% | 5.5337% | -8.1536% |
| Ptf CARs n 1 (4 securities) | -3.4235% | -9.7170% | -2.2820% |
| CAAR group 1 (4 securities) | -3.1722% | -8.7917% | 0.5063% |
| Ptf CARs n 2 (36 securities) | -15.3434%\*\* | -5.6253% | -12.7060%\* |
| CAAR group 2 (36 securities) | -15.2557%\*\*\* | -5.1471%\*\*\* | -11.0235%\*\*\* |
| \*\*\* p-value < .01, \*\* p-value <.05, \* p-value <.1 | | | |

Another strong evidence to indicate that the abnormal returns were very likely to be caused by the release of the “Double Reduction” policy is the difference between HK-based companies and mainland-based companies. Among all 40 selected H-share stocks, 4 of them operate exclusively in Hong Kong. In this case, they should not be considered the targets of the “Double Reduction” policy. Table 12 above shows a consistent result that only companies that contain mainland business yield statistically significant abnormal returns. It also reflects that the market is sensitive and accurate when processing and reacting to new information.

* + 1. **China concept stock**

There are in total 28 China concept stocks selected as companies involved in the “Double Reduction” Policy. The stocks are divided into only 3 groups because no technical support and equipment provider for the education industry is listed in the U.S. stock market. Different from the distribution in A-shares and H-shares, around half of China concept education stocks belong to the group of K-12 off-campus curriculum subject-tutoring, including the three largest china online education companies: New Oriental (EDU), Gaotu (GOTU) and Tomorrow Advancing Life (TAL). Going public in the U.S. market seems to be a very popular option for K-12 off-campus curriculum subject-tutoring companies.

Table 13: CAR and CAAR of China concept stocks in regular event window

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **SECURITY** | **CAAR[-1,1]** | **CAAR[-5,5]** | **CAAR[-10,10]** | **CAAR[-10,0]** | **CAAR[0,10]** |
| AMBO | -29.2754% | -39.5016% | -43.7060% | -44.9818% | -3.2360% |
| COE | -65.1623%\*\*\* | -68.7746%\*\*\* | -63.4234%\*\* | -76.3962%\*\*\* | -13.3939% |
| EDU | -74.9639%\*\*\* | -73.6813%\*\*\* | -70.8410%\*\*\* | -87.7979%\*\*\* | -16.7580% |
| FEDU | -9.9980% | -21.4468% | -11.9101% | -25.0177% | 17.9357% |
| GOTU | -74.9295%\*\*\* | -70.7174%\*\* | -71.8325%\* | -115.7843%\*\*\* | 15.5437% |
| IH | -44.8820%\*\*\* | -29.1163% | -19.7254% | -36.8036% | -0.5504% |
| LAIX | -39.1653%\*\*\* | -31.1015% | -39.8329% | -55.0917%\*\* | 1.4575% |
| NEW | -51.2255%\*\*\* | -43.3239%\*\* | -42.2058% | -59.4273%\*\*\* | -4.5748% |
| ONE | -55.6975%\*\*\* | -39.9923%\*\*\* | 16.5254% | -38.6298%\*\*\* | 44.3787%\*\*\* |
| REDU | -49.0795%\*\*\* | -47.4678%\*\*\* | -45.5855%\*\*\* | -44.3028%\*\*\* | -12.0866% |
| TAL | -71.1751%\*\*\* | -55.6511%\*\*\* | -45.4370%\*\* | -94.0808%\*\*\* | 22.3358% |
| ZME | -55.5353%\*\*\* | -16.3510% | -17.3714% | -42.5917% | 7.7885% |
| YQ | -52.6607%\*\*\* | -62.0470%\*\* | -53.7247% | -78.3900%\*\*\* | -1.2950% |
| Ptf CARs n 1 (8 securities) | -50.6393%\*\*\* | -46.9091%\*\*\* | -40.1268%\*\* | -63.0963%\*\*\* | 5.2540% |
| CAAR group 1 (8 securities) | -49.5375%\*\*\* | -42.8466%\*\*\* | -32.5570%\*\*\* | -59.0844%\*\*\* | 9.1763% |
| BEDU | -17.1047%\*\*\* | -10.7746% | -3.0197% | -12.9692% | 2.2470% |
| FHS | -56.0331%\*\*\* | -41.5309%\*\* | -33.9886% | -55.2254%\*\*\* | -10.3674% |
| HLG | -15.5292%\*\*\* | -11.5441%\* | -6.9102% | -14.9462%\*\* | 4.5826% |
| RYB | -33.4620%\*\*\* | -37.7790%\*\* | -33.4951% | -13.8007% | -23.2946% |
| Ptf CARs n 2 (8 securities) | -30.0426%\*\*\* | -25.0860%\*\*\* | -19.8038%\*\* | -24.3989%\*\*\* | -6.4487% |
| CAAR group 2 (8 securities) | -29.6814%\*\*\* | -23.7958%\*\*\* | -17.3897%\* | -23.1391%\*\*\* | -5.1877% |
| AACG | -18.3154% | -45.5375% | -73.9461% | -21.7351% | -79.4495% |
| CLEU | -13.9093% | -19.2825% | -21.0514% | -20.4168% | 10.3319% |
| CSCW | -16.8799% | -13.5371% | -27.0240% | -24.5962% | -3.8077% |
| DAO | -90.9874%\*\*\* | -60.8487%\*\*\* | -46.3095% | -71.2779%\*\*\* | -8.6474% |
| EDTK | -28.3712%\*\*\* | -22.3287% | -2.0330% | -9.3066% | -4.0408% |
| LXEH | -7.2462% | -3.6669% | -21.8054% | -9.3001% | -12.9359% |
| METX | -17.8121% | -13.9170% | -4.1892% | -40.7781% | 31.7618% |
| STG | -26.7571%\*\*\* | -22.1354% | -26.8541% | -23.0800% | -3.6596% |
| TEDU | -33.1347%\*\*\* | -41.1260%\*\*\* | -35.5345%\*\* | -33.7828%\*\*\* | -14.1085% |
| WAFU | -27.8565% | -31.7271% | -44.7018% | -52.6300% | 1.8835% |
| ZCMD | -5.9605% | 0.2020% | -4.3250% | -6.6494% | 1.5493% |
| Ptf CARs n 3 (8 securities) | -35.6157% | -60.7004% | -93.3643% | -63.9535% | -40.5365% |
| CAAR group 3 (8 securities) | -23.9872%\*\* | -21.9370% | -22.9704% | -25.8714% | -4.2740% |
| \*\*\* p-value < .01, \*\* p-value <.05, \* p-value <.1 | | | | | |

Table 14: CAR and CAAR of China concept stocks in wide-span event window

|  |  |  |  |
| --- | --- | --- | --- |
| **SECURITY** | **CAAR[-20,0]** | **CAAR[0,20]** | **CAAR[0,30]** |
| AMBO | -39.0233% | -27.1100% | -22.6570% |
| COE | -90.6780%\*\*\* | -29.5067% | 9.9700% |
| EDU | -111.4334%\*\*\* | -39.5607%\*\* | 2.3442% |
| FEDU | -29.9588% | -6.7003% | -6.4767% |
| GOTU | -121.6716%\*\*\* | -13.6677% | 29.4214% |
| IH | -35.4631% | -16.5031% | -8.6592% |
| LAIX | -60.0509% | -10.7149% | -5.4252% |
| NEW | -79.9912%\*\*\* | -21.1450% | 6.4249% |
| ONE | -58.2834%\*\*\* | 10.5233% | 8.3111% |
| REDU | -67.0046%\*\*\* | -31.4126%\* | -27.8246% |
| TAL | -107.1596%\*\*\* | -1.8017% | 23.3150% |
| ZME | -36.5933% | -18.7712% | 24.6134% |
| YQ | -102.5880%\*\* | -14.6613% | 19.8374% |
| Ptf CARs n 1 (13 securities) | -76.9054%\*\*\* | -18.7780% | -0.2299% |
| CAAR group 1 (13 securities) | -69.0159%\*\*\* | -11.1987% | 11.0340% |
| BEDU | -15.6387% | 0.2131% | -8.7025% |
| FHS | -56.1580%\*\* | -17.3620% | 1.2108% |
| HLG | -10.3542% | 1.4154% | 1.9382% |
| RYB | -6.3796% | -42.7073%\* | -44.1515% |
| Ptf CARs n 2 (4 securities) | -23.1348%\*\* | -14.8963% | -13.3832% |
| CAAR group 2 (4 securities) | -20.6848%\*\* | -12.4587% | -9.7890% |
| AACG | -83.5342% | -136.7044% | -170.1599% |
| CLEU | -33.1421% | 49.1058%\* | 71.3896%\*\* |
| CSCW | -34.6541% | -8.7013% | 23.4524% |
| DAO | -88.0519%\*\*\* | -13.8965% | 32.8619% |
| EDTK | -16.8556% | -21.0889% | -11.5498% |
| LXEH | -27.5355% | -9.9237% | 2.0498% |
| METX | -48.3394% | 28.6221% | 42.0641% |
| STG | -25.0464% | -18.4071% | -25.2599% |
| TEDU | -39.6319%\*\* | -49.7461%\*\*\* | -40.0525%\* |
| WAFU | -68.2544% | -19.2841% | -10.4266% |
| ZCMD | -6.8648% | -1.1421% | 1.0738% |
| Ptf CARs n 3 (11 securities) | -116.7028% | -85.0404% | -105.9432% |
| CAAR group 3 (11 securities) | -39.6905% | -13.9641% | -0.5779% |
| \*\*\* p-value < .01, \*\* p-value <.05, \* p-value <.1 | | | |

From Table 13 above, it is clear that the results share a similar pattern with that of A-shares and H-shares in terms of group difference and quick stop of the slump, but the scale of negative abnormal returns of education China concept stocks is considerably larger. Meanwhile, according to Table 15 below, K-12 off-campus curriculum subject-tutoring companies even reveal a more negative CAAR in the event window of [-20,0] and [-10,0] than that of the event window [-1,0], which indicates that the market was aware of the effect imposed by the “Double Reduction” policy at least 20 trading days before it was officially introduced.

Table 15: CAR and CAAR of China concept stocks in left-skewed event window

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **SECURITY** | **CAAR[-1,0]** | **CAAR[-3,0]** | **CAAR[-5,0]** | **CAAR[-7,0]** | **CAAR[-9,0]** |
| AMBO | -22.7954% | -26.0584% | -39.8354% | -39.9110% | -48.2792% |
| COE | -69.8391%\*\*\* | -70.9199%\*\*\* | -73.1357%\*\*\* | -75.5373%\*\*\* | -71.9599%\*\*\* |
| EDU | -88.5995%\*\*\* | -85.3148%\*\*\* | -88.4224%\*\*\* | -93.3618%\*\*\* | -85.9514%\*\*\* |
| FEDU | -9.8590% | -13.1782% | -21.6269% | -21.5777% | -20.2828% |
| GOTU | -91.1337%\*\*\* | -94.0170%\*\*\* | -99.1833%\*\*\* | -108.7006%\*\*\* | -108.6269%\*\*\* |
| IH | -39.7203%\*\*\* | -36.0365%\*\*\* | -36.3303%\*\* | -33.7206%\* | -43.7650%\*\* |
| LAIX | -42.2096%\*\*\* | -45.0913%\*\*\* | -44.8302%\*\* | -46.2706%\*\* | -51.5043%\*\* |
| NEW | -55.0248%\*\*\* | -50.0893%\*\*\* | -50.7230%\*\*\* | -56.1078%\*\*\* | -55.7205%\*\*\* |
| ONE | -48.0385%\*\*\* | -35.0306%\*\*\* | -34.4127%\*\*\* | -38.2585%\*\*\* | -38.0364%\*\*\* |
| REDU | -51.3507%\*\*\* | -51.7950%\*\*\* | -46.8605%\*\*\* | -47.8161%\*\*\* | -48.6561%\*\*\* |
| TAL | -97.3070%\*\*\* | -89.6005%\*\*\* | -91.6888%\*\*\* | -101.5278%\*\*\* | -90.4458%\*\*\* |
| ZME | -50.2936%\*\*\* | -44.4112%\*\*\* | -39.7273%\*\* | -41.9163%\* | -46.0373%\* |
| YQ | -65.5908%\*\*\* | -71.0511%\*\*\* | -73.2269%\*\*\* | -73.6970%\*\*\* | -75.6360%\*\*\* |
| Ptf CARs n 1 (13 securities) | -55.3147%\*\*\* | -54.5768%\*\*\* | -57.2508%\*\*\* | -60.6292%\*\*\* | -61.6672%\*\*\* |
| CAAR group 1 (13 securities) | -54.4892%\*\*\* | -52.8728%\*\*\* | -54.8359%\*\*\* | -57.6874%\*\*\* | -58.0620%\*\*\* |
| BEDU | -18.4834%\*\*\* | -13.3456%\*\*\* | -14.0220%\*\* | -10.9053% | -12.9260% |
| FHS | -51.7389%\*\*\* | -52.3676%\*\*\* | -55.5844%\*\*\* | -55.8575%\*\*\* | -57.1991%\*\*\* |
| HLG | -13.6294%\*\*\* | -15.2041%\*\*\* | -16.2866%\*\*\* | -16.3774%\*\*\* | -17.4653%\*\*\* |
| RYB | -23.9125%\*\*\* | -25.5562%\*\* | -25.9289%\*\* | -26.4143%\* | -21.7537% |
| Ptf CARs n 2 (4 securities) | -26.4305%\*\*\* | -26.3122%\*\*\* | -27.7455%\*\*\* | -27.3008%\*\*\* | -27.4260%\*\*\* |
| CAAR group 2 (4 securities) | -26.1692%\*\*\* | -25.7834%\*\*\* | -26.9973%\*\*\* | -26.3676%\*\*\* | -26.2839%\*\*\* |
| AACG | -12.4103% | -23.9642% | -25.4048% | -18.3481% | -21.1091% |
| CLEU | -2.9965% | -12.2910% | -11.6271% | -12.9820% | -21.6861% |
| CSCW | -11.4961% | -14.7947% | -20.1213% | -22.2919% | -20.6521% |
| DAO | -77.4362%\*\*\* | -75.9316%\*\*\* | -79.1026%\*\*\* | -74.6809%\*\*\* | -71.2010%\*\*\* |
| EDTK | -26.1930%\*\*\* | -18.6327%\* | -20.4397% | -17.6117% | -16.0342% |
| LXEH | -7.1462% | 3.1745% | 2.4151% | 2.2793% | -8.8197% |
| METX | -33.7466%\*\*\* | -29.4371%\* | -25.7393% | -32.3841% | -37.7026% |
| STG | -11.2869%\* | -6.7639% | -15.9114% | -19.4278% | -23.1121%\* |
| TEDU | -31.6908%\*\*\* | -31.8563%\*\*\* | -32.7206%\*\*\* | -30.7416%\*\*\* | -31.5313%\*\*\* |
| WAFU | -33.2463% | -39.5932% | -38.8955% | -45.3535% | -49.5858% |
| ZCMD | -7.4094% | -4.1852% | -5.1542% | -5.0924% | -8.6420% |
| Ptf CARs n 3 (11 securities) | -31.3609% | -40.6026% | -48.2128% | -50.9805% | -59.4843% |
| CAAR group 3 (11 securities) | -21.4333%\*\* | -21.1869% | -22.7597% | -22.6296% | -25.5965% |
| \*\*\* p-value < .01, \*\* p-value <.05, \* p-value <.1 | | | | | |

Figure 2: Plot of China concept stock CAARs from event day -20 to event day -1

Figure 2 demonstrates a more explicit pattern of the pre-event reaction from the market. The CAAR of K-12 off-campus curriculum subject-tutoring companies in the event window [-16, 0] even reaches -70%. In fact, both H-shares and China Concept stocks in Group 1 show a low at this point. It would be interesting to investigate what kind of information leaking or signs have triggered such strong negative abnormal returns to China’s education industry.

* 1. **Event study group by market cap**

Table 16: A-shares grouped by market cap

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **SECURITY** | **CAAR[-1,1]** | **CAAR[-5,5]** | **CAAR[-10,10]** | **CAAR[-10,0]** | **CAAR[0,10]** |
| Offcn | -13.5490%\*\* | -15.1908% | -29.6443%\* | -24.8807%\*\* | -11.7884% |
| Chuanzhi | -20.7148%\*\* | -26.7126% | -36.1703% | -33.4850%\* | -9.0347% |
| Talkweb Information | -3.9276% | -13.2352% | -18.1396% | -13.2679% | -7.6005% |
| Ptf CARs n 2 (2 securities) | -10.8950%\* | -17.0955% | -21.9809% | -20.5476%\* | -5.4731% |
| CAAR group 2 (2 securities) | -12.1609%\*\* | -19.7899%\* | -26.8228%\* | -23.2507%\*\* | -8.0949% |
| Eastern Pioneer | -12.6212%\*\* | -7.1403% | -9.3454% | -0.0737% | -14.9161% |
| Action Education | -9.5566% | -25.9966% | -32.9113% | -11.6565% | -21.4667% |
| Ptf CARs n 3 (2 securities) | -11.9392%\*\* | -13.3391% | -14.0804% | -2.6441% | -14.7686% |
| CAAR group 3 (2 securities) | -11.0441%\*\* | -16.0912% | -20.3955% | -5.4537% | -17.8330% |
| Dark Horse | -3.8952% | -3.2662% | -5.1559% | -3.4427% | -7.1555% |
| Botong | -1.4840% | -1.3728% | 1.6391% | -1.5353% | 2.5505% |
| Qtone | -15.5556%\*\*\* | -13.1076% | -12.0831% | -11.7353% | -14.5537% |
| B-ray | -7.1825%\*\* | -5.9404% | -1.6214% | -5.6610% | -1.7801% |
| Doushen | -37.4098%\*\*\* | -16.5998% | -6.3898% | -16.2699% | -10.6773% |
| China Hi-Tech | 0.8215% | 4.2674% | 4.2592% | -1.6197% | 3.7318% |
| Great Wall Of Culture | -11.2822%\*\* | -10.4664% | -23.9862% | -9.4747% | -14.9315% |
| Kingsun | -25.1973%\*\*\* | -29.1037%\*\*\* | -33.1752%\*\* | -22.6295%\*\* | -20.9097%\*\* |
| China Reform Culture | 4.9178% | 1.9414% | -0.3799% | 7.3885% | 3.1615% |
| Kingswood Inks | -25.1418%\*\*\* | -14.1958% | -10.0904% | -17.2792% | -4.3137% |
| Xueda | -22.2013%\*\*\* | -30.3650%\*\*\* | -27.5302%\* | -16.3912% | -19.2296%\* |
| Sansheng | -14.3999%\*\* | -7.4854% | -2.8089% | -8.0708% | -2.2564% |
| Kaiyuan | -15.0929%\*\*\* | -2.5510% | 24.8009% | 0.0432% | 16.3934% |
| Only | -22.4110%\*\*\* | -18.2534%\*\*\* | -18.1341%\*\* | -15.7715%\*\*\* | -11.5937%\*\* |
| Kaiwen | -12.7560%\*\*\* | -6.7451% | -6.1138% | -13.8770% | -1.9735% |
| Mygym | -17.1364%\*\*\* | -4.8237% | -10.7772% | -12.9935% | -7.1663% |
| Ptf CARs n 4 (16 securities) | -13.8653%\*\*\* | -9.5979%\* | -7.5765% | -9.1855%\* | -5.2494% |
| CAAR group 4 (16 securities) | -13.7304%\*\*\* | -9.2277%\*\*\* | -6.9091%\*\* | -8.8374%\*\*\* | -4.8722%\*\* |
| \*\*\* p-value < .01, \*\* p-value <.05, \* p-value <.1 | | | | | |
| \* Group 1: >¥100Bn; Group 2: ¥10Bn - ¥100Bn; Group 3: ¥5Bn - ¥10Bn; Group 4: <¥5Bn | | | | | |

Table 17: H-shares grouped by market cap

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **SECURITY** | **CAAR[-1,1]** | **CAAR[-5,5]** | **CAAR[-10,10]** | **CAAR[-10,0]** | **CAAR[0,10]** |
| Tencent | -5.0055% | -6.6381% | -7.8172% | -2.7029% | -6.9049% |
| New Oriental | -89.3622%\*\*\* | -72.8838%\*\*\* | -63.7939%\*\*\* | -74.2867%\*\*\* | -33.7530%\*\*\* |
| China Education | -18.7994%\*\*\* | -8.9911% | -11.8092%\* | -22.7368%\*\*\* | -2.1100% |
| Yu Hua | -24.2146%\*\*\* | -16.0304%\*\* | -27.3976%\*\*\* | -29.5402%\*\*\* | -15.0180%\*\* |
| East Edu | -4.9654% | -3.2840% | -14.1232%\*\* | -17.1620%\*\*\* | -0.8730% |
| Hope | -21.5334%\*\*\* | -6.7388% | -9.7330% | -20.0466%\*\*\* | -4.3464% |
| Kepei | -23.6697%\*\*\* | -8.9150% | -11.3908%\* | -15.7695%\*\* | -11.6327%\* |
| NetDragon | -8.1814% | 3.5727% | -8.1778% | 1.1674% | -10.9661%\* |
| Ptf CARs n 2 (7 securities) | -25.7162%\*\*\* | -14.5432%\*\* | -19.1207%\*\*\* | -24.0550%\*\*\* | -10.1529% |
| CAAR group 2 (7 securities) | -25.6161%\*\*\* | -14.1621%\*\*\* | -18.4183%\*\*\* | -23.6742%\*\*\* | -9.7637%\*\* |
| Koolearn | -55.3344%\*\*\* | -17.8407%\*\*\* | -19.0432%\*\*\* | -52.2054%\*\*\* | 3.4253% |
| New Higher | -19.9312%\*\*\* | -5.3308% | -9.0889% | -20.2441%\*\*\* | 3.2611% |
| Xinhua Winshare | -0.6941% | -3.9499% | -6.1553% | -3.6797% | -4.5062% |
| Tianli | -29.7267%\*\*\* | -2.0794% | 2.3422% | -22.0384%\*\*\* | 1.1516% |
| Maple Leaf | -12.3124%\* | -5.4821% | -7.2152% | -8.4475% | -4.8542% |
| Min Sheng | -9.1142% | -1.6283% | -4.5187% | -18.0461%\*\*\* | 5.8920% |
| Wisdom education | -12.5356%\* | -3.3700% | -2.4551% | -15.8748%\*\* | 1.0015% |
| Neusoft | -2.3166% | 1.4969% | -1.7644% | -2.5766% | 0.2287% |
| Jia Hong | -5.0180% | -2.5389% | -4.1316% | -2.3250% | -4.5945% |
| Xinhua Edu | -17.7805%\*\*\* | -3.1180% | -17.3886%\*\*\* | -15.1117%\*\* | -12.8544%\* |
| Virscend | -10.8392%\* | -13.5066%\*\* | -27.3635%\*\*\* | -11.6475%\* | -23.9813%\*\*\* |
| Chen Lin | -6.3713% | -1.0097% | -2.5566% | -3.6946% | -2.6855% |
| Gench Edu | -12.7236%\* | -13.7334%\*\* | -15.5915%\*\* | -9.1123% | -12.1910%\* |
| Scholar Edu | -56.9433%\*\*\* | 18.4884%\*\*\* | 10.9863%\* | -42.4666%\*\*\* | 11.9058%\* |
| Chunlai | 5.9744% | 3.8170% | 5.7644% | -0.5717% | 3.7649% |
| Beststudy | -77.9867%\*\*\* | -59.3321%\*\*\* | -66.2440%\*\*\* | -48.3681%\*\*\* | -59.4702%\*\*\* |
| Ptf CARs n 3 (16 securities) | -18.8133%\*\*\* | -4.5785% | -8.0999% | -15.9347%\*\* | -4.1907% |
| CAAR group 3 (16 securities) | -18.8410%\*\*\* | -4.2970% | -7.4273%\* | -15.6441%\*\*\* | -3.8697% |
| Modern Education | -4.4428% | -7.4204% | -11.7178%\* | -8.1707% | -7.2003% |
| Chuanglian | -6.1157% | -18.2547%\*\*\* | -37.6846%\*\*\* | -7.9766% | -27.5376%\*\*\* |
| Gingko | -5.5683% | -4.6745% | 0.7074% | -2.8150% | 0.4181% |
| 21st Century Edu | -51.0328%\*\*\* | -16.6779%\*\* | -0.5028% | -19.8555%\*\*\* | -0.0784% |
| Bojun | 9.9397% | -4.9536% | -27.0167%\*\*\* | -1.1258% | -21.6845%\*\*\* |
| Dashan Education | -16.2142%\*\* | -7.0817% | -8.4783% | -15.3144%\*\* | -0.6432% |
| Leader Edu | -10.8130% | -7.9228% | -20.4458%\*\*\* | -5.3002% | -19.2887%\*\*\* |
| Top Edu | -7.9058% | 12.9468%\*\* | 25.8431%\*\*\* | 10.3253% | 17.2173%\*\*\* |
| First Capital | 10.0264% | 12.0331%\* | 10.3142% | 6.0698% | 7.2144% |
| BExcellent Group | 0.6666% | -3.3031% | -0.5834% | -6.3280% | 2.7267% |
| OUC Holdings | -13.0746%\*\* | -29.1605%\*\*\* | -28.9627%\*\*\* | -9.8990% | -21.9053%\*\*\* |
| SDM Edu | -2.8042% | 8.6923% | -4.2253% | -16.1417%\*\* | 10.6546% |
| China Oriented | -4.1534% | -2.6087% | -10.4951% | -4.5422% | -6.5662% |
| China E-Info Tech | 4.9085% | -10.1949% | 27.5036%\*\*\* | 33.9744%\*\*\* | -6.8033% |
| Shentong Robot | 9.8372% | -2.4269% | -16.1913%\*\* | -1.0382% | -14.8674%\*\* |
| Dadi | -16.7885%\*\* | -11.2936%\* | 0.0894% | 3.7204% | -9.7445% |
| Ptf CARs n 4 (16 securities) | -6.2791% | -5.2595% | -6.5165% | -2.5982% | -6.3912% |
| CAAR group 4 (16 securities) | -5.9943%\*\* | -3.8711% | -3.7947% | -1.2756% | -4.9206% |
| \*\*\* p-value < .01, \*\* p-value <.05, \* p-value <.1 | | | | | |
| Group 1: >HK$ 5Tn; Group 2: HK$ 10Bn - HK$ 100Bn; Group 3: HK$ 1Bn - HK$ 10Bn; Group 4: <¥1Bn | | | | | |

Table 18: China concept stocks grouped by market cap

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **SECURITY** | **CAAR[-1,1]** | **CAAR[-5,5]** | **CAAR[-10,10]** | **CAAR[-10,0]** | **CAAR[0,10]** |
| TAL | -71.1751%\*\*\* | -55.6511%\*\*\* | -45.4370%\*\* | -94.0808%\*\*\* | 22.3358% |
| EDU | -74.9639%\*\*\* | -73.6813%\*\*\* | -70.8410%\*\*\* | -87.7979%\*\*\* | -16.7580% |
| Ptf CARs n 1 (2 securities) | -72.5046%\*\*\* | -63.9588%\*\*\* | -57.4411%\*\*\* | -90.5250%\*\*\* | 3.1258% |
| CAAR group 1 (2 securities) | -72.4816%\*\*\* | -63.8531%\*\*\* | -57.2321%\*\*\* | -90.4287%\*\*\* | 3.2537% |
| GOTU | -74.9295%\*\*\* | -70.7174%\*\* | -71.8325%\* | -115.7843%\*\*\* | 15.5437% |
| DAO | -90.9874%\*\*\* | -60.8487%\*\*\* | -46.3095% | -71.2779%\*\*\* | -8.6474% |
| ZME | -55.5353%\*\*\* | -16.3510% | -17.3714% | -42.5917% | 7.7885% |
| HLG | -15.5292%\*\*\* | -11.5441%\* | -6.9102% | -14.9462%\*\* | 4.5826% |
| Ptf CARs n 2 (4 securities) | -57.8321%\*\*\* | -41.8654%\*\*\* | -42.0501%\*\* | -64.2278%\*\*\* | 1.5532% |
| CAAR group 2 (4 securities) | -56.1499%\*\*\* | -35.7808%\*\*\* | -30.6872%\* | -58.1922%\*\*\* | 7.4554% |
| YQ | -52.6607%\*\*\* | -62.0470%\*\* | -53.7247% | -78.3900%\*\*\* | -1.2950% |
| IH | -44.8820%\*\*\* | -29.1163% | -19.7254% | -36.8036% | -0.5504% |
| BEDU | -17.1047%\*\*\* | -10.7746% | -3.0197% | -12.9692% | 2.2470% |
| ONE | -55.6975%\*\*\* | -39.9923%\*\*\* | 16.5254% | -38.6298%\*\*\* | 44.3787%\*\*\* |
| FHS | -56.0331%\*\*\* | -41.5309%\*\* | -33.9886% | -55.2254%\*\*\* | -10.3674% |
| COE | -65.1623%\*\*\* | -68.7746%\*\*\* | -63.4234%\*\* | -76.3962%\*\*\* | -13.3939% |
| STG | -26.7571%\*\*\* | -22.1354% | -26.8541% | -23.0800% | -3.6596% |
| TEDU | -33.1347%\*\*\* | -41.1260%\*\*\* | -35.5345%\*\* | -33.7828%\*\*\* | -14.1085% |
| NEW | -51.2255%\*\*\* | -43.3239%\*\* | -42.2058% | -59.4273%\*\*\* | -4.5748% |
| REDU | -49.0795%\*\*\* | -47.4678%\*\*\* | -45.5855%\*\*\* | -44.3028%\*\*\* | -12.0866% |
| LXEH | -7.2462% | -3.6669% | -21.8054% | -9.3001% | -12.9359% |
| RYB | -33.4620%\*\*\* | -37.7790%\*\* | -33.4951% | -13.8007% | -23.2946% |
| Ptf CARs n 3 (12 securities) | -39.9375%\*\*\* | -36.6136%\*\*\* | -26.6683%\*\*\* | -39.9977%\*\*\* | -0.3658% |
| CAAR group 3 (12 securities) | -39.5141%\*\*\* | -35.0130%\*\*\* | -23.5617%\*\*\* | -38.4171%\*\*\* | 1.2896% |
| METX | -17.8121% | -13.9170% | -4.1892% | -40.7781% | 31.7618% |
| AACG | -18.3154% | -45.5375% | -73.9461% | -21.7351% | -79.4495% |
| LAIX | -39.1653%\*\*\* | -31.1015% | -39.8329% | -55.0917%\*\* | 1.4575% |
| AMBO | -29.2754% | -39.5016% | -43.7060% | -44.9818% | -3.2360% |
| CSCW | -16.8799% | -13.5371% | -27.0240% | -24.5962% | -3.8077% |
| FEDU | -9.9980% | -21.4468% | -11.9101% | -25.0177% | 17.9357% |
| ZCMD | -5.9605% | 0.2020% | -4.3250% | -6.6494% | 1.5493% |
| WAFU | -27.8565% | -31.7271% | -44.7018% | -52.6300% | 1.8835% |
| CLEU | -13.9093% | -19.2825% | -21.0514% | -20.4168% | 10.3319% |
| EDTK | -28.3712%\*\*\* | -22.3287% | -2.0330% | -9.3066% | -4.0408% |
| Ptf CARs n | -30.9688% | -60.9295% | -95.2494% | -66.3729% | -37.8041% |
| CAAR group | -19.2087% | -21.7628% | -24.1419% | -27.9012% | -1.1627% |
| \*\*\* p-value < .01, \*\* p-value <.05, \* p-value <.1 | | | | | |
| \*Group 1: >$ 10Bn; Group 2: $ 1Bn - $ 10Bn; Group 3: $ 1 Mn - $ 1Bn; Group 4: <1 Mn | | | | | |

The relationship between market cap and abnormal return is not as straightforward as that of the main business and abnormal return, but there still exist similarities across different markets. For selected H-share and China concept stocks, companies with smaller market cap were less negatively affected than large-cap firms.

* 1. **Logistic Regression**

Table 19: A-shares logistic regression

|  |  |  |  |
| --- | --- | --- | --- |
|  | Odds Ratio | | |
| VARIABLES | CAAR[-1,1] | CAAR[-5,5] | CAAR[-10,10] |
| marketcapbn | 1.460 | 0.861 | 0.940 |
|  | (0.429) | (0.324) | (0.338) |
| PE | 0.972\* | 0.990 | 0.993 |
|  | (0.0150) | (0.0155) | (0.0172) |
| ROE | 0.959 | 1.023 | 1.004 |
|  | (0.0455) | (0.0247) | (0.0201) |
| Constant | 3.317 | 0.566 | 0.203 |
|  | (4.395) | (0.839) | (0.311) |
| Observations | 21 | 21 | 21 |
| Standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 | | | |

Table 20: H-shares logistic regression

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Odds Ratio | | | |
| VARIABLES | CAAR[-1,1] | CAAR[-5,5] | CAAR[-10,10] | CAAR[-10,0] |
| K-12curriculum | 5.857\* | 8.257\*\* | 1.120 | 5.428 |
|  | (5.872) | (8.383) | (1.052) | (5.908) |
| marketcapbn | 0.999 | 0.999 | 0.999 | 0.999 |
|  | (0.00162) | (0.00213) | (0.00175) | (0.00157) |
| PE | 1.008 | 0.985 | 0.994 | 1.013 |
|  | (0.0103) | (0.0107) | (0.00650) | (0.0137) |
| ROE | 1.006 | 1.006 | 0.989 | 1.014 |
|  | (0.00985) | (0.0102) | (0.0109) | (0.0117) |
| Constant | 0.388\*\* | 0.298\*\* | 0.672 | 0.507 |
|  | (0.170) | (0.145) | (0.259) | (0.237) |
| Observations | 40 | 40 | 40 | 40 |

Standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 21: China concept stock logistic regression

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Odds Ratio | | | |
| VARIABLES | CAAR[-1,1] | CAAR[-5,5] | CAAR[-10,10] | CAAR[-10,0] |
| K-12curriculum | 3.305 | 4.203 | 3.269 | 8.691\* |
|  | (4.475) | (4.287) | (4.345) | (9.717) |
| marketcapmn | 1.033\*\* | 1.001 | 1.000 | 1.002\* |
|  | (0.0156) | (0.000814) | (0.000205) | (0.000908) |
| PE | 1.003 | 1.013 | 1.003 | 1.024 |
|  | (0.0168) | (0.0190) | (0.0141) | (0.0213) |
| ROE | 1.000 | 0.995 | 1.002 | 0.996 |
|  | (0.00458) | (0.00345) | (0.00490) | (0.00336) |
| Constant | 0.0268\*\* | 0.171\*\* | 0.0621\*\*\* | 0.130\*\* |
|  | (0.0481) | (0.145) | (0.0665) | (0.121) |
| Observations | 28 | 28 | 28 | 28 |

Standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

For H-shares, whether the company belongs to the group of K-12 off-campus curriculum subject-tutoring plays a key role in whether the stock would have abnormal return in the event window. In the event window of [-5,5], if a company’s main business is K-12 off-campus curriculum subject-tutoring, it is around 8.25 times more likely to have a statistically significant negative cumulative abnormal return. As to other features, there is no sufficient evidence to indicate their causal relationship with the existence of abnormal returns.

For China Concept stocks, the market cap seems to be an influential factor resulting in negative abnormal returns. In the event window [-1, 1], if the market cap of a security increases by $1 million, it is around 3.3% more likely to have a statistically significant negative CAAR.

1. **Conclusion**

In conclusion, this paper successfully uses event study methods to evaluate the effect of the release of the “Double Reduction” policy on China's education stocks in a systematic way. There exist similar patterns in the abnormal returns of A-share, H-share, and China concept stocks if grouped by the main business. The Cumulative Average Abnormal Returns of the K-12 curriculum subject-tutoring companies are significantly larger in scale compared to that of other K-12 education service providers and non-K-12 education service providers, while technical support and equipment provider companies nearly suffered no negative effect. If viewed by a longer event window, only K-12 curriculum subject-tutoring companies reveal a persistent statistically significant negative abnormal return. Moreover, such slumps in China's education stocks do not last very long. Even the most suffered group ceases falling with no significant negative abnormal returns after 20 trading days of the event and resumed moving consistently with the market trend.

Meanwhile, there also exist differences among different markets in terms of scale and time. The abnormal returns of H-shares and China Concept Stocks are not only larger than that of the A-shares, but also occurred earlier before the event. This indicates that the market is not completely surprised by the release of the “Double Reduction” policy. On the contrary, it had known, or sensed, that the event was going to take place at least 20 trading days before the official launching day and had reacted in a timely and accurate way.

Compared with using main business to group securities, using the market cap as criteria is less efficient in terms of the pattern it reveals, so as the logistic regression methods. But they do serve as a convincing supplement to demonstrate the results mentioned above. It would be interesting to include more indicators about securities other than market caps, PE ratios, and ROEs and then investigate their relations to the existence of abnormal returns. Time series methods could also be utilized to discover which stage of a policy release, or what kind of information leaking, would have the most significant effect on the stock market.

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