From Wall Street to Hong Kong: The Value of Dual Listing for China Concept Stocks*

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Abstract

The U.S. stock market has long been the most popular venue for both foreign companies and global investors. The recent cross-border regulation tensions between the U.S. and China, however, have exposed many U.S.-listed China Concepts Stocks (CCS) to substantial delisting risks, forcing them to pursue dual listings on the Hong Kong Stock Exchange (HKEX). In this paper, we quantify the economic value of dual-listing, using the SEC's adoption of the final amendments implementing mandates of the Holding Foreign Companies Accountable Act (HFCAA) on December 2, 2021 as a natural experiment. We estimate that CCS with pre-shock dual-listing status on average have 14.88% higher returns, or USD 8 billion in market capitalization, than their peers listed only on the U.S. exchanges during a three-month period after the shock. Our findings survive a set of robustness checks, including parallel trends test, alternative treatment and control groups based on the qualified but not yet dual-listed CCS, and various sub-sample and placebo analyses. In addition to stock returns, dual-listed CCS are also less adversely affected in trading volume, volatility, and liquidity. Our findings highlight the large economic impact of the escalating political U.S.-China tensions on the global financial markets.

Keywords: Cross-border Regulation; China Concept Stocks; Dual listing

JEL Classification: G12, G14

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1 Introduction

The U.S. equity market has long been regarded as the best venue for foreign firms to list their shares overseas. The academia, as well as practitioners, has argued that listing in the U.S. offers foreign firms many benefits such as lower capital costs, a larger shareholder base, better investor protection, higher liquidity, and prestige.[1] In contrast to these well-documented benefits, the costs of listing in the U.S., mainly considered to be regulatory burdens of the U.S. Securities and Exchange Commission (SEC) reporting and compliance requirements, are often overlooked in the literature and viewed as negligible compared to the benefits.

The recent tensions between U.S. and Chinese regulators over the inspection of auditors for China-based issuers in the U.S. capital market highlight a novel but important regulatory risk faced by foreign companies. The key dispute is centered on whether the Public Company Accounting Oversight Board (PCAOB), with authorization from the Sarbanes-Oxley Act of 2002 (SOX), can inspect China-based audit firms located in their home jurisdictions, where granting access to the PCAOB would be regarded as a breach of national sovereignty and in conflicts with local laws. After years of unsuccessful negotiations between the two countries' regulators, the Holding Foreign Companies Accountable Act (HFCAA) was finally passed and signed into law by President Donald Trump on December 18, 2020, followed by the SEC's release of the final amendments implementing the HFCAA mandates on December 2, 2021. Under the law, the U.S.-listed Chinese companies will be banned from trading and eventually delisted from the U.S. exchanges if the PCAOB is not able to conduct on-site inspection and have full access to audit working papers for three consecutive years.[2]

Partially in response to the regulatory conflicts between the United States and China, as well as to compete with global exchanges, the Hong Kong Stock Exchange (HKEX) have made a series of reforms on its listing rules, with the first and most important reform taking effect on April 30, 2018.[3] These reforms greatly relax the HKEX's original listing

[1] A partial list of these studies include Mittoo (1992), Fanto and Karmel (1997), Miller (1999), Foerster and Karolyi (1999), Coffee (1998), Stulz (2018), Coffee (2002), Reese and Weisbach (2002), Doidge, Karolyi, and Stulz (2004), Siegel (2005), Kastiel and Libson (2019), and Tsang, Yang, and Zheng (2022), among others.

[2] An accelerating bill is in the legislative process and if the bill is passed, Chinese issuers have two years to have their financial reports complied with PCAOB requirements.

[3] The HKEX launched the most substantial listing reform in decades on April 30, 2018, allowing the listing of qualified pre-profit biotech companies and innovative companies with weighted voting rights (WVR) structures, as well as establishing a secondary listing route for companies incorporated outside Hong Kong and mainland China with a business focus in Greater China that are primary listed on a major exchange (i.e., NYSE, NASDAQ, and London Stock Exchange). On November 17, 2019, HKEX announced changes to further relax the listing requirements of oversea issuers and extend opportunities for Chinese homecoming listings on the HKEX. On October 19, 2022, HKEX issued a consultation paper that expands Hong Kong's listing regime to companies in one of the five Specialized Technology Industries, with a view toward launching

requirements on firm size, profit, and the structure of voting rights, and establish a secondary listing route for Chinese Concepts Stocks (CCS) listed on the U.S. exchanges. As a result, many U.S.-listed Chinese issuers start to seek dual-listings status at the Hong Kong market to mitigate the potential negative shock in case they were forced to be delisted from the U.S. exchanges. By the end of November 2021, there are in total 23 U.S.-listed CCS having the dual-listing status on the HKEX, with 18 of them obtained the dual-listing status after the HKEX's reform in 2018.[4]

In this paper, we quantify the economic value of HKEX dual-listing status, by exploiting the SEC's adoption of the final amendments implementing mandates of the HFCAA on December 2, 2021 as a natural experiment. Specifically, we follow a difference-in-differences approach that estimates the return difference between the U.S.-listed CCS with and without the dual-listing status at the HKEX around the event. We find that the dual-listed CCS have 14.88% higher average cumulative returns than their peers without the dual listing status during a three-month period after the policy shock. Magnitude wise, the average dollar value of having a listing status at Hong Kong is approximately USD 8 billion for a typical dual-listed CCS.

One concern is that the dual-listed CCS may be fundamentally different from the U.S.-listed-only CCS, which could cause the observed differential market reactions if their return sensitivities to certain market-wide shocks widen further after the policy shock. We employ multiple approaches to address this endogeneity concern. First, we include a set of interactive fixed effects across industry, market capitalization, and time in our DID analysis to absorb the time-varying impacts of size and industry, the two most important firm characteristics that are known to be related to stocks' unobserved sensitivities to macroeconomic shocks.

Second, we exploit an institutional feature that the HKEX has established explicit qualification standards for companies seeking dual-listing in Hong Kong. We identify a group of qualified but not yet dual-listed CCS and re-estimate the value of dual-listing using these firms as the control group. In this alternative setting, we find that the relatively higher return associated with dual-listing remains significant and has a slightly smaller magnitude of 13.43%. Since these qualified-but-not-yet-dual-listed CCS are comparable to the dual-listed CCS in many dimensions before the shock, the empirical evidence further supports our argument that it is the actual dual-listing status that contributes to the observed return pattern after the policy shock. Other combinations of treatment and control groups, sub-sample analyses, and placebo tests using alternative event dates, all confirm that the dual-listing on

in the first half of 2023. The official announcements of the Hong Kong Exchanges and Clearing Limited can be obtained from the exchange's website: https://www.hkex.com.hk.

[4]Additional nine U.S.-listed CCS obtain dual-listing status after the SEC's final amendments in 2021/12, adding the total number of dual-listed CCS to 32 by the end of 2022.

HKEX carries a positive value for U.S.-listed CCS.

Our paper builds on the observation that HKEX could provide an important safe harbor for dual-listed CCS in the event of a mandatory de-listing on the U.S. exchanges. Indeed, we find that investors have gradually shifted the trading and depository of CCS from the U.S. to Hong Kong, a process which has accelerated in light of increasing de-listing risk following the effectiveness of the HFCAA. As of April 2022, the U.S. market accounts for only 60% of the global trading volume of U.S. listed CCS, a large decline from nearly 100% in 2019. In terms of depository, 15% of the U.S.-listed shares are deposited in Hong Kong, accounting for almost half of the total market capitalization.

Lastly, we examine the impact of the policy shock on the Hong Kong market by comparing the performance of dual-listed CCS with similar HKEX-listed-only CCS. For dual-listed CCS, even though their HKEX listing status provides critical protection, losing access to the U.S. capital market would still have a significant impact given the U.S.'s central role in the global financial markets. The HKEX-listed-only CCS, on the other hand, are not directly affected by the policy shock since they are not under the U.S. jurisdiction. We find that the dual-listed CCS perform statistically and economically worse than their matched HKEX-listed-only peers, with a magnitude of -7% to -10% depending on the model specification. That is, while dual-listed CCS experience smaller adverse impact than those only listed in the U.S. market, they still under-perform their Hong Kong peers.

Our study adds to the broad literature on international cross-listings. Most of the existing studies focus on understanding why firms choose to go public abroad. Several theories have been proposed: the investor recognition hypothesis based on the expansion of shareholder base (Merton, 1987; Miller, 1999; Foerster and Karolyi, 1999), the bonding hypothesis based on investor protection through stronger legal enforcement and reputational concerns (Coffee, 1998; Stulz, 2018; Coffee, 2002; Reese and Weisbach, 2002; Siegel, 2005), the insulation hypothesis based on increased costs and barriers for hostile takeovers (Kastiel and Libson, 2019; Tsang et al., 2022). These theories often predict large economic benefits for listing in the U.S. stock markets, while the associated costs, such as SEC reporting and compliance requirements, legal fees, and investment banking fees, seem to be negligible. Despite the apparent imbalance between benefits and costs, Doidge et al. (2004) point out a puzzling fact that very few large foreign firms choose to be listed in the U.S., and argue that the expropriation motivations of the controlling shareholders affect firms' listing decisions.

We contribute to the literature by highlighting an important source of risk associated with listing in the U.S., which is brought up by the cross-broader regulatory conflicts instead of firms' own fundamentals. To a large extend, such risk is the opposite of the traditional bonding mechanism proposed in the literature, by which foreign firms can voluntarily comply themselves to higher disclosure standards and stricter enforcement in the U.S. capital market

to reduce agency costs and attract investors. Our paper shows that there could also be substantial risk associated with the bonding mechanism, i.e., the compliance requirements in the U.S. could expose foreign firms to forced de-listing when the regulatory conflicts between the U.S. and the listing firms' home country couldn't be reconciled.

Our paper is also related to a growing strand of literature on the PCAOB's international inspection practices. Prior studies find that PCAOB inspections not only improve audit quality (Gramling, Krishnan, and Zhang, 2011; Aobdia, 2018; Defond and Lennox, 2017; Fung, Raman, and Zhu, 2017; Gipper, Leuz, and Maffett, 2019), but also have positive real effects such as reducing information uncertainty in M&A deals and mitigating financing frictions (see., e.g., Kim, Su, Zhou, and Zhu, 2020; Shroff, 2019). Several papers study the market reactions to the announcements of PCAOB conducting international inspections. Carcello, Carver, and Neal (2018) and Gu, Jiang, and Simunic (2022) document negative market reactions to the PCAOB's announcement in May 2010 of its inability to inspect audit firms located in several foreign countries, and argue that the market reactions support the review that PCAOB international inspections create value for foreign firms through improved financial reporting quality, after net of the additional regulatory burden. Our paper complements these studies by documenting various market reactions to the delisting risk associated with the PCAOB international inspections, which was less a threat during the early years of international regulatory negotiations but has become real after the introduction of the HFCAA.

The regulatory conflict is against the backdrop of the escalating competition of the U.S. and China, which began as a tit-for-tat over tariffs in 2018 and has been gradually developed into a full-front rivalry over trade, key technologies, and capital market access between the world's largest and second-largest economies. Our paper therefore adds to the recent discussions on U.S.-China decoupling and de-globalisation, as discussed by Fajgelbaum, Goldberg, Kennedy, and Khandelwal (2020), García-Herrero and Tan (2020), Antras (2020), and Antras and De Gortari (2020), among many others. Our focus is centered around the global financial markets when the likelihood of regulatory bodies reaching cooperative agreements diminishes significantly in the mist of increased international political tensions.

The rest of our paper is organized as follows. Section 2 discussed the institutional background. Section 3 details the data used in this paper. Section 4 presents the main empirical results. Section 5 concludes the paper. Additional results and discussions are provided in the appendices.

2 Institutional Background

In this section, we provide discussions on the background of the Chinese Concept Stocks listed on the U.S. exchanges, the decade-long U.S.-China regulation disputes, and the policy shock of the SEC's announcement of the final amendments of the HFCAA implementation on December 2, 2021.

2.1 Chinese Concepts Stocks

Along with China's phenomenal economic growth in the past three decades, Chinese companies have merged as important players in the global capital markets. Due to stringent IPO requirements in the domestic China A-share market, among other reasons,[5] many Chinese firms choose to list overseas, mostly in Hong Kong and the United States. Since the first oversea IPO by the Chinese firm Brilliance China Automotive in 1992, 1,346 and 366 Chinese firms have been successfully listed on the Hong Kong and the U.S. exchanges as of 2021/12, raising USD 458.9 and 74.2 billion in proceeds, respectively.

[Place Figure 1 about here]

Figure 1 plots the number and proceeds of CCS IPOs in Hong Kong and the U.S. from 2000 to 2021. Despite occasional ups and downs, there is a general upward trend in CCS IPOs over the past two decades. A majority of CCS are private companies and a few of the early IPOs were large state-owned enterprises, especially in the U.S. market. More than half of CCS choose HKEX as their listing place and only around 25% of CCS IPO proceeds are raised from the U.S. The fraction of U.S. listed CCS is similar if we exclude SOEs.

The total market capitalization of the CCS excluding SOE in each of the two markets are shown in Figure 2. Note that, CCS play an important role in HKEX in terms of market capitalization. By the end of 2021, the 911 HKEX-listed CCS have a total market capitalization of USD 2.83 trillion, accounting for approximately half of the aggregate market capitalization of the Hong Kong stock market. By comparison, the 320 Chinese firms listed on the U.S. exchanges account for less than 2% of the US equity market. [6]

[Place Figure 2 about here]

[5] China prohibits firms in some certain industries to be listed in A-share market, e.g., crypto currency, FinTech, and some specific social media platform. On the other hand, many CCS are financed by USD venture capital funds, and thus it is easier for primary market investors to exit if listed in the U.S. stock markets.

[6] The aggregate year-end market capitalization of the U.S. stock market is from the CRSP database and that of the Hong Kong stock market is from the Wind database.

American Depositary Receipt. Many of the CCS list their shares on the U.S. exchanges through the creation of American Depositary Receipts (ADRs), which allow U.S. investors to invest in non-U.S. securities without direct access to the oversea markets. An ADR refers to a negotiable certificate issued by a U.S. depositary bank for a specified number of non-U.S. securities that are held by a custodian, often by an overseas branch of the depositary bank, in the home country of the non-US issuer. The depositary bank converts all dividends and other payments of the non-U.S. securities into USD and passes them to the ADR holders. The depositary bank can also issue (cancel) receipts to investors when the requisite number of shares are deposited (withdrawn) in the issuer's home country. Some CCS also choose to be listed as common stock on a U.S. exchange. For these firms, they are incorporated as companies in the U.S., although their main business and revenues are from mainland China. In our sample, 135 CCS are listed via ADRs and 78 CCS are listed via ordinary shares. For more details on ADRs, interested readers can refer to the discussions in Miller (1999) and Foerster and Karolyi (1999).

Variable Interest Entities. Foreign investors, including venture capitals and private equity, have been flocking to China for investment opportunities since the late 1990s. However, due to restrictions under the current Chinese law, direct foreign investments in certain industries such as telecommunication, media, and the internet, are strictly prohibited. To bypass these restrictions, Chinese entrepreneurs and global investors design a complicated corporate structure, the so-called variable interest entities (VIE).[7]

Figure 3 presents a simplified illustration of a typical VIE structure. Foreign investors and a British Virgin Islands (BVI) incorporated company controlled by the founder jointly create a Cayman company as the future listed entity. This offshore company uses a Hong Kong SPV—for tax advantages—to set up an onshore wholly foreign owned enterprise (WFOE), the business scope of which usually includes a variety of consulting services. Because the WFOE is not allowed to directly invest in the onshore entity, which has the legal claim on corporate assets and provides daily business operations, the WFOE signs contractual arrangements with the onshore company to ensure: (1) the de facto controlling over the domestic operating company; (2) receiving the onshore company's profits/dividends as the form of service fees.

[Place Figure 3 about here]

In addition to the benefit of bypassing the regulatory restrictions, the VIE structure also provides a convenient exit channel for international investors, allowing them to sell

[7]Sina Corporation is the first CCS listed on the U.S. stock market via a VIE structure. The company raised USD 68 million from an IPO on NASDAQ in April 2000.

their shares directly in oversea stock markets without being subject to China's strict capital controls. On the other hand, the contractual arrangement embedded in the VIE structure, which differs from the direct ownership, creates a legal gray area and regulatory vacuum, which brings up the decade-long U.S.-China regulation debate.

Weighted Voting Rights. Many CCS adopt the weighted-voting-rights (WVR) structure that gives certain group of shareholders voting power or other related rights that are disproportionate to their share holdings. Companies with a WVR structure typically issue two share classes, each with different voting rights. A small group of shareholders, usually the company's founders and other key employees, own the class of shares with multiple votes for each share, while other shareholders own the other class of shares with one vote each. The WVR structure is popular among CCS, especially for those in the burgeoning new technology sectors, because the voting bias favors the founders and puts them in a stronger position to maintain control of their companies and be able to make key corporate decisions.

The WVR structure has been allowed by major U.S. exchanges since the 1980s. Hong Kong Stock Exchanges (HKEX), on the other hand, has been holding the "one-share-one-vote" principle until recently.[8] Amid intense competition from global exchanges, the HKEX amended its listing rules in April 2018, allowing companies with the WVR structure (individual beneficiaries) to be listed for the first time. To be eligible, the issuing company needs to belong to an "Emerging and Innovative Sector", and satisfies a set of requirements on market capitalization, revenue, minimum holdings of the WVR beneficiaries, and internal corporate governance. Since October 2020, the HKEX allows certain Greater China companies that are directed by corporate WVR beneficiaries to have a secondary listing in Hong Kong.[9]

2.2 U.S.-China Cross-border Regulation

The U.S. and Chinese regulators have long disagreed on the regulation and disclosure requirements on U.S.-listed CCS. The key challenge is that whether PCAOB can access auditing working papers and conduct onsite investigations of the auditing firms that prepare CCS' financial reports, which are located in Hong Kong and mainland China, and thus may in-

[8]For example, the IPO of Chinese E-commerce behemoth, Alibaba Group, raised USD 25 billion on the New York Stock Exchange in 2014 and is one of the world's biggest IPOs. Even though the Alibaba Group did not adopt the WVR structure, the company was turned down by the HKEX, because the shareholder structure of Alibaba gives its founding shareholders the right to appoint a majority of the board, which contravenes the Exchange's "one-share-one-vote" principle.

[9]Comparisons of HKEX listing requirements before and after the 2018 reform are presented in Appendix Table A4. In 2021/3, HKEX further relaxed the listing rules by allowing overseas-listed Greater China companies with WVR structure to be secondary or primary dual listed, which were finalized in 2021/12 and became effective from 2022/1/1. In this paper, we don't differentiate secondary or dual primary listing on the Hong Kong Stock Exchange.

duce conflict with Chinese laws. From the perspective of U.S. regulators, it is important that all foreign companies listed on the U.S. exchanges comply with the same set of financial reporting rules to ensure investor protection. On the other side, Chinese regulators see the inspection as a form of cession of sovereignty and worry that possible breach of sensitive data would endanger the country's national security.

Public Company Accounting Oversight Board (PCAOB). In response to a number of major corporate and accounting scandals, PCAOB was created in 2002 as one of the regulatory consequences of the Sarbanes-Oxley Act.[10] As a nonprofit corporation under the guidance and approval of the SEC, the primary responsibility of PCAOB is to oversee auditors of public companies. PCAOB serves as the "auditor" of auditors for public companies, including U.S.-listed foreign firms, to ensure that they comply with the SEC's requirements on preparing audit reports. Over the past two decades, PCAOB has reached cooperative agreements with regulators in more than 50 foreign jurisdictions. These agreements allow PCAOB and the foreign regulators to conduct on-site inspections and request audit work papers of public companies that are listed on each other's exchanges. However, after years of negotiation, PCAOB has not been able to reach cooperative agreements with mainland China and Hong Kong (to the extent that audit clients operate in mainland China), which eventually triggered the delisting crisis of U.S.-listed CCS starting from 2020.

Holding Foreign Companies Accountable Act (HFCAA). Amid a backdrop of increasingly heightened scrutiny of U.S.-listed Chinese companies, the Holding Foreign Companies Accountable Act was proposed to address restrictions China has placed on the PCAOB's ability to inspect or investigate PCAOB-registered public accounting firms that provide audit services for CCS. The bill was passed the U.S. Senate on May 20, 2020, and then the House on December 2, 2020, both by unanimous consent.[11] On December 18, 2020, the incumbent U.S. president Donald J. Trump signed the bill into law. Figure 4 presents the timeline of important events regarding the HFCAA.

[Place Figure 4 about here]

[10]The Sarbanes-Oxley Act, also known as The Public Company Accounting Reform and Investor Protection Act, was passed in 2002 after a series of major corporate and accounting scandals, including Enron, Tyco, and WorldCom. The objective of the Act is to protect investors by improving the accuracy and reliability of corporate disclosures. The Act marks as the largest amendments to the 1934 Securities Laws Act on corporate governance, risk management, and auditing and financial report disclosure (Linck, Netter, and Yang, 2009).

[11]The consideration of the Holding Foreign Companies Accountable Act in Congress coincided with the high-profile financial scandal involving Chinese coffee chain Luckin Coffee, which fabricated approximately USD 310 million in its 2019 sales report. Luckin fired both its CEO and COO in May 2020 and was forced to delist from the NASDAQ exchange in June 2020.

2.3 The Policy Shock: the SEC's Final Amendments of the HFCAA Implementation

Our policy shock is the SEC announcement of the final amendments of the mandates required by the HFCAA on December 2, 2021. The release of the final amendments indicates that the HFCAA has advanced from the legislative process to the implementation phase, triggering a clear schedule to delist Chinese firms from the U.S. securities exchanges and the over-the-counter markets by 2024, if not earlier.

According to the final amendments, the SEC identifies issuers that file audit reports prepared by registered public accounting firms located in foreign jurisdictions and that the PCAOB is unable to inspect or investigate completely because of a position taken by an authority in those jurisdictions. Once an issuer has been identified for three consecutive years (2022, 2023, and 2024), an initial trading prohibition would be imposed on any national securities exchange as well as the over-the-counter trading.[12]

It is worth emphasizing that the development of the HFCAA contains several milestone events, as shown in Figure 4. We choose the announcement of the SEC's final amendments over other milestones, such as the enactment of the HFCAA and the release of the first provisional list of issuers, for a couple of reasons. First, the adoption of the final amendments is a clear progress in implementing the Act, which substantially increases the delisting risk of all U.S.-listed CCS. The final amendments not only establish the rules and mandates that Chinese issuers must abide by but also introduce a clear and formal delisting timetable. Second, considering that the duration between the enactment and enforcement dates may occasionally be quite long for some legal acts (Christensen, Hail, and Leuz, 2016), we expect a much weaker market response to the enactment of the HFCAA due to uncertainties of the legislation process. Indeed, we observe a smaller and statistically insignificant differential market reactions for CCS with and without HK listing status using the HFCAA enactment as the policy shock, as discussed in Section 4.2.2.

3 Data

In this section, we describe the data and construction of the key variables. We also compare the firm characteristics of dual-listed CCS to those only listed in the U.S.

[12]For more details on the HFCAA implementation procedure, see "Resolving the Lack of Audit Transparency in China and Hong Kong: Remarks at the International Council of Securities Associations (ICSA) Annual General Meeting".

3.1 Data and Variable Construction

We first obtain the list of 270 U.S.-listed CCS identified by the U.S.-China Economic and Security Review Commission from the Commission's website.[13] We apply several filters on the list, including: 1) not state owned enterprise (SOE); 2) not special purpose acquisition company (SPAC); 3) IPO date before 2020/12/31; 4) not delisted as of 2021/9/4, which is the beginning of our sample period; 5) market capitalization greater than USD 10 million as of 2020/12/31. After applying these filters, we have a total of 213 CCS listed on the U.S. stock exchanges in our sample.

Our data come from various sources. We obtain the daily returns and financial information of the U.S.-listed CCS from CRSP and COMPUSTAT. For missing observations, we use the data obtained from Wind, a leading data vendor for Chinese capital markets, to fill the gap. The high-frequency intraday trading data are obtained from the TAQ database. Institutional ownership data of U.S.-listed CCS are obtained from the SEC 13F fillings via Wind.

We focus on the sample period from September 4, 2021 to March 3, 2022, a $[-90, +90]$-day window centered around the event day of the SEC's release of the final HFCAA amendments on December 2, 2021. The *Treatment* group contains 18 dual-listed CCS as of December 1, 2021, while the *Control* group contains 195 U.S.-listed-only CCS. The full list of *Treatment* CCS is reported in Appendix Table A1.

[Place Table 1 about here]

Table 1 reports the summary statistics of the key variables. Our dependent variables include the cumulative excess returns (CER, in %), the cumulative abnormal returns adjusted by the CAPM or the Fama-French three-factor model estimated using a 252-day pre-event window with at least 150 observations (CAR, in %), daily dollar-weighted effective spreads (ES, in %), daily high-minus-low spread (HLS, in %), and the intraday five-minute return volatility (VOL, in %). Macro-related control variables include TED spread (TED, in %), the Hong Kong Hang Seng Index return (Mkt_{hk}, in %), and CBOE Volatility Index (VIX). All variables are winsorized at the 1% and 99% levels. See Appendix Table A2 for the detailed definitions of variables.

[13] https://www.uscc.gov/sites/default/files/2022-03/Chinese_Companies_on_US_Stock_Exchanges.pdf

3.2 Determinants of HKEX Dual-listing

We compare firm characteristics of the U.S.-listed-only and dual-listed CCS in Table 2. Panel A reports the average values of market capitalization ($Size$, in USD billion), book-to-market ratio (BM), firm leverage ($Leverage$), ROE (ROE), market beta ($Beta$), and institutional ownership ($InstOwn$, in %) for treated, control, and the difference between the two groups. All variables using accounting information are measured as of 2020/12/31, market beta is estimated using a 252-day window prior to the [−90, +90]-day event window, and the institutional ownership is measured as of 2021/9/30.

Dual-listed CCS tend to be large stocks with higher institutional ownership. On average, dual-listed CCS has a market capitalization of USD 66.62 billion at the end of 2020, compared to a much smaller size of USD 3.59 billion for U.S.-listed-only CCS. The average institutional ownership of dual-listed CCS is 43.21%, compared to just 11.30% for CCS listed only in the U.S. The two types of CCS are similar in other firm characteristics such as BM, leverage, and market beta.

[Place Table 2 about here]

In a formal test, we use kitchen sink regressions to investigate firm characteristics that are related to firms' dual-listing status. Panel B of Table 2 reports the results of OLS regressions that regress a dummy variable for firms' dual-listing status on various firm characteristics. As shown in Column (1), size alone explains 29% of cross-sectional variations of firms' dual-listing status. The estimated coefficient is 6.42 and statistically significant at the 1% significance level. Institutional ownership, book-to-market and leverage are also related to firms' dual-listing status. However, a horse-racing test that pools all firm characteristics together, as reported in Column (6), shows that size is the strongest characteristics in explaining the dual-listing status. The R^2 of the horse-racing regression is 33%, which is only a marginal improvement (4%) over the regression using size as the only regressor. The results suggest that other non-size characteristics play a minor role in determining dual-listing status. In later analysis, we carefully control size to reduce potential confounding effect on our estimation.

4 Empirical Results

In this section, we present our main empirical findings which are centered around estimating the economic value of the dual-listing status for CCS. We first present the baseline results using DID estimators. We then introduce interactive fixed effects and examine the parallel trend assumption to address endogenous concerns. We provide DID results using several

different treatment and control groups, and conduct several robustness and placebo tests. Lastly, we examine the policy impacts on CCS share depository, trading, and liquidity, as well as the impact on the Hong Kong stock market.

4.1 The Value of Dual Listing: DID Estimator

Our empirical results start with a DID design. We present our DID estimation setup, examine the validity of the parallel trend assumption, and investigate the impacts of alternative choices of treatment and control groups on our estimates.

4.1.1 DID Estimations

As discussed in Section 2.3, we choose the policy shock date as 2021/12/2 which is the day when the SEC released the final amendments to implement the HFCAA. Our sample period is from 2021/9/4 to 2022/3/3, a six-month window centered around the date of the policy shock. Our empirical strategy begins with a difference-in-differences design as following:

$$CER_{it} = \alpha Treat_i \times Post_t + a_i + \tau_t + Z_i \times \tau_t + \gamma X_{it} + u_{it}. \tag{1}$$

The dependent variable is the daily cumulative excess returns (CER_{it}) or cumulative abnormal returns (CAR_{it}) of stock i on day t. $Treat_i$ takes the value of one if stock i is a dual-listed CCS before the event day, and $Post_t$ equals one if day t is on or after the event day. We include the firm fixed effects a_i, the week fixed effects τ_t, along with the interactive fixed effects $Z_i \times \tau_t$ to absorb unobservable time-varying shocks to firms within certain industry (or size) groups.[14] Since we have already included both the firm and the week fixed effects, the term $Treat_i$ and $Post_t$ are omitted in the regression setup. Lastly, we include several daily macroeconomic variables X_{it}, i.e., the TED spread, the CBOE VIX index, and the Hong Kong stock market index return, as additional control variables.

[Insert Table 3 about here]

Table 3 presents the DID estimates for various model specifications. In the first six columns, the dependent variable is the daily cumulative excess return. Specifically, we report the results using firm and week fixed effects separately without and with controls in Columns (1) and (2); firm and industry×week fixed effects in Column (3); firm and size×week fixed effects in Column (4); firm, industry×week, and size×week fixed effects in Column (5); and

[14]The definition of $Treat_i$ and $Post_t$ follows the observation that the SEC announcement was released during the trading hours of the event day on 2021/12/2. Considering that the event date is a Thursday, τ_t is defined as the week from Thursday to the following Wednesday.

firm and industry×size×week fixed effects in Column (6).[15] The last two columns use CAPM and Fama-French three-factor-adjusted CAR as the dependent variables and have the same model specification as that in Column (6). The coefficients are in percentage, the standard errors are clustered by firms and reported in the parentheses below.[16]

After controlling for the firm and time specific shocks, Columns (1) and (2) show that CCS with pre-shock dual-listing status on average have 11.82% higher cumulative excess returns than their peers listed only on the U.S. exchanges over a six-month window around the policy shock. This effect is economically large, considering that the average annual return of U.S.-listed CCS is 9.74% over the decade from 2011 to 2020.[17]

One might be concerned about potential endogeneity issues in our findings—some unobservable firm characteristics that are related to CCS's dual-listing status may have a time-varying effect on their returns as well. Many such examples are associated with industry-specific policy changes rolled out by the Chinese government in recent years. For example, in July 2021, the Central Committee of the Chinese Communist Party, China's top leadership organization, issued a "Double Reduction" policy that prohibits private education companies from providing off-campus K-9 tutoring services. Another example is the anti-monopoly campaign launched in October 2021 to tighten controls over technology firms, especially mega-cap platform companies. These policies have a large negative impact on the stock returns of the target companies, which may confound our findings because they are rolled out at times close to our policy shock and the impacts of these industry-specific regulatory changes may vary over time. We address such endogeneity concerns by including the interactive fixed effects between industry and week.[18] Column (3) shows that the results remain quite similar – dual-listed CCS earn a significant 11.97% higher returns than their peers after the policy shock.

Another kind of endogenous concern stems from the fact that CCS with dual-listing status

[15]We use the ten first-level industry classifications provided by Wind Inc.. We use the market capitalization (as of 2020/12/31) of all NYSE-listed stocks to form size breakpoints and sort CCS into five size groups accordingly. Our results remain similar to alternative industry and size classifications.

[16]We also adopt two-way clustered standard errors by firm and week and the results remain largely unchanged (Appendix Table A3). We do not choose two-way clustered standard errors for our main results because the number of required clusters for consistency is counted independently for two dimensions in two-way clustered standard errors and a simple rule-of-thumb is 50 clusters (see., e,g, Angrist and Pischke, 2009; Cameron, Gelbach, and Miller, 2011; Cameron and Miller, 2015), while we only have 26 weekly clusters.

[17]The average annual return of U.S.-listed CCS is estimated based on the annual returns of NASDAQ Golden Dragon China Index from 2011 to 2020. The NASDAQ Golden Dragon China is a widely followed index that tracks the performance of U.S. publically traded companies with majority of business conducted within China.

[18]A more subtle endogenity concern arises from the possibility that investors may have stronger concern over CCS in certain industries after the HFCAA implemention news hit, as these CCS may be more difficult to access Hong Kong or mainland China capital market in case of forced delisting. The estimator might over-estimate the effect of dual-listing if we do not include the interactive fixed effects between industry and time.

are typically large stocks due to HKEX market capitalization requirements. Meanwhile, small stocks are more sensitive to systemic risk factors and such sensitivity may increase after the policy shock. Small stocks therefore could react more strongly to other risks after the policy shock, which increased the beta spread between small and large stocks. To absorb the unobserved time-varying effects that are related to firm size, we add the interactive fixed effects of firm size and week in our regression model. Column (4) presents the estimation result. Consistent with our conjecture that smaller CCS may experience more negative return shocks, the estimated coefficient after controlling for the size-time effect is 8.39%, which is 3.43 percent lower than the baseline estimate. However, the estimated dual-listing premium is still statistically significant with a strong t-statistic of 3.94, suggesting that the time-varying size effect can only absorb relative a small portion of the dual-listing premium and our main findings remain robust and significant.

In Columns (5) and (6), we present the results by adding the above two sets of interactive fixed effects and three-dimension interactive fixed effects across industry, size, and week. The dual-listing premia remain positive and statistically significant, with magnitudes of 9.75% and 14.88%, respectively. It is worth noting that the regression coefficient for the last specification with three-dimension interactive fixed effects is greater than the one of 11.82% in Column (2), implying that omitted variable bias is a valid concern. CCS in certain industries and size groups may be affected differently after the policy shock, and we need to account for this endogeneity in our DID regression specification.

The results for the CAPM and the Fama-French three-factor adjusted cumulative abnormal returns are presented in the last two columns of Table 3. The estimated coefficients are comparable to those based on raw excess returns.

Overall, our results support the hypothesis that dual-listed CCS enjoy a premium relative to their peers listed only in the U.S.. In terms of economic magnitude, the raw return difference of 14.88% translates to a USD 8 billion increase in market capitalization for CCS with dual-listing status, which had an average market capitalization of USD 53.73 billion prior to the policy shock. Alternatively, the raw return difference implies a USD 0.33 billion drop in market capitalization for U.S.-listed-only CCS, based on their average pre-shock market capitalization of USD 2.19 billion. When the delisting risk in the U.S. elevates substantially following the SEC's release of the HFCAA amendments, the HKEX listing status provides a critical safety net for the dual-listed CCS, allowing them to maintain access to the global capital market in the event of a mandatory de-listing from the U.S. exchanges. Our results show that this dual-listing benefit is correctly priced in the equity market as a premium and quantify the economic magnitude through a carefully designed difference-in-differences setup.

4.1.2 Dynamic Treatment Effects of the Policy Shock

After establishing the effect of the dual-listing status on the CCS stock returns, we estimate a dynamic treatment effect model to examine whether the parallel trend assumption is satisfied. In particular, we want to investigate whether the dual-listed and U.S.-listed-only CCS had similar market reactions in the absence of the release of the HFCAA implementation, which would imply a counterfactual parallel trend before the event day on 2021/12/2. The model specification is as following:

$$CER_{it} = \sum_{k=-11}^{12} d_k D_i^k + a_i + Ind_j \times Size_l \times \tau_t + \gamma X_{it} + u_{it}. \tag{2}$$

The sample period is divided into 24 weekly subperiods around the event day. D_i^k equals one for the treatment group in the post-event subperiod k and zero otherwise. We include firm fixed effects a_i, the three-dimension interactive fixed effects across industry Ind_j, size $Size_l$, and week τ_t, and macro-related control variables X_{it}. The dependent variable is the daily cumulative excess return CER_{it}.[19]

Figure 5 plots the estimates of d_k along with the associated 95% confidence intervals, where the coefficient immediately before the event date is normalized to zero. After the policy shock, returns of CCS with HKEX dual-listing status are significantly larger than those of U.S.-listed-only CCS. The return spreads react immediately at the week right after the event and become even larger afterward, ranging between 3% to 10% for the twelve-week post-event subperiod and being statistically significant.

Note that none of the return differences between the treatment and control CCS is statistically significant for the weeks before the event date, as shown by the insignificant estimates of the coefficients d_k for $k < 0$. The parallel trend assumption is therefore satisfied in our study.

4.1.3 Alternative Treatment and Control Groups

As discussed in the previous section, an important endogeneity concern for our exercise is that the dual-listed CCS may differ in nature from those that are not dual-listed. As a result, the treatment and control stocks might have different exposures to some unobservable market-wide shocks and this difference could be further amplified by the policy shock of the HFCAA implementation. In this section, we use different treatment and control stocks in

[19]The results are similar if we use CAR with respect to the Fama-French three-factor model (Panel A of Appendix Figure A1). Note that some interactive fixed effects could be redundant as they might be collinearized with the explanatory variable D_t^k. We also estimate a dynamic DID model with both firm fixed effects and time fixed effects separately, and the pattern is similar (Panel B of Appendix Figure A1).

the DID estimations to further analyze how such a possibility affects our results.

For our analysis, we depend on an important institutional detail of the HKEX, which releases a set of qualification standards for U.S.-listed CCS seeking dual-listing, either secondary listing or dual-primary listing, at the Hong Kong market. Specifically, a typical CCS without WVR share structure can apply for HKEX dual-listing if: 1) already listed on other major markets for five years with a market capitalization of at least HKD 3 billion; or 2) already listed on other major markets for two years with a market capitalization of at least HKD 10 billion. For CCS with WVR, a listing history of two years is required with 1) a minimum market capitalization of HKD 40 billion; or 2) a minimum market capitalization of HKD 10 billion and revenue of at least HKD 1 billion for the most recent audited financial year.

Based on these HKEX qualification rules, we divide the CCS in the control group into two subgroups: firms that are not HK-listed but qualified for dual listing (Group 2) and firms that are unqualified for dual listing (Group 3), as of the policy shock date on 2021/12/2.[20] We denote the treatment group of dual-listed CCS as Group 1.[21] We estimate the DID regressions for different combinations of treatment and control groups, using the same model specification as the one in Column (8) of Table 3.

[Place Table 4 about here]

Table 4 presents the results. In the first column, we choose Group 2, i.e., the qualified but not dual-listed yet CCS, as the control group. Because CCS in Group 2 also meet the HKEX requirements and thus have similar characteristics as the dual-listed CCS, we are able to provide a better apple-to-apple comparison between the two groups. If it is not the actual dual-listing status that drives the return difference, we would expect to see no change in the returns of the dual-listed CCS (Group 1) and qualified but not dual-listed CCS (Group 2) after the event. It is not the case. Group 1 CCS earn 13.43% higher Fama-French three-factor adjusted returns than Group 2, confirming that it is indeed the dual-listing status, not some latent firm characteristics, that contributes to the higher returns of the CCS in Group 1. Compared with the baseline estimates (Group 2 and Group 3 as controls), the estimated dual-listing premium is only 0.5% lower when only Group 2 are used as controls. In Column (2), we use only Group 3 as controls. The estimated dual-listing premium is, not surprisingly, higher than our baseline estimate, at 18.56% and statistically significant.

[20]The list of firms that are not HK-listed but qualified for dual listing is reported in Appendix Table A5.

[21]The requirements for dual primary listing are a little more stringent than secondary listing. Most dual-listed CCS (14 out of 18 in our sample) choose secondary dual listing and we use secondary listing requirements to determine a CCS' dual-listing qualification. The requirements for HKEX secondary listing can be found on https://www.hkex.com.hk/Listing/Rules-and-Guidance/Listing-of-Overseas-Companies/Secondary-Listings-in-Hong-Kong?sc_lang=en, the main content of which is recreated in Appendix Table A6.

We also examine the effect of qualification by combining Groups 1 and 2 as the treatment and Group 3 as the control. Column (3) of Table 4 shows that the coefficient is 9.73% and is not statistical significant at the 5% level. The smaller estimate is as expected because the benefit of being qualified but not dual-listed should be lower than the benefit of being dual-listed. In addition, according to Angrist and Pischke (2009), this specification of "offered but (self-choose) not being treated" provides an underestimate of the true treatment effect, i.e., the value of dual-listing status in our context.

Lastly, we compare the return difference of Group 2 (qualified but not dual-listed) and Group 3 (not qualified) in Column (4). The magnitude is much smaller at 5.62% with no statistical significance. Since Group 2 are qualified for HKEX listing, they share similar firm characteristics as Group 1 and differ substantially from Group 3. The smaller and insignificant DID coefficient based on Group 2 and 3 shows again that time-varying firm sensitivities alone can not generate significant return differences between the treatment and control. In other words, our baseline results are driven by the dual-listing status of CCS, rather than the differences in firm characteristics.

4.2 Robustness Tests and Further Discussions

In this section, we present additional results, including subsample and robustness analyses, placebo tests using other alternative dates, and the impacts on depository, trading, and liquidity.

4.2.1 Subsample and Robustness Tests

Table 5 presents the results of several subsample and robustness analyses of our DID estimation. The model specification is the same as the one used in Column (8) of Table 3. Column (1) uses the subsample of CCS that are above the median market capitalization as of 2020/12/31. The regression coefficient for the DID term is at similar magnitude of 13.83%, ruling out the concern that our finding is mainly driven by smaller CCS in the control group that might experience larger price drop after the policy shock.

Column (2) uses the subsample excluding the first four weeks after the event date. The coefficient is slightly larger of 14.85%. By excluding the first four weeks of observations, we argue that our results are not driven by temporary panic selling pressure on the CCS in the control group. The SEC's release on the implementation of HFCAA has a long-term impact on US-listed-only CCS, resulting in their under-performance relative to dual-listed CCS.

Many of the U.S.-listed CCS adopt the WVR share structure. Given that HKEX requires more stringent listing requirements for CCS with the WVR, we examine the robustness of our

results with respect to this special share structure. In Column (3), we report the estimation results using only WVR firms as the control group. The estimated coefficient is 13.50% and close to our baseline estimates.

Lastly, Column (4) presents the results for a longer 12-month event window around the event date. The estimated coefficient is 12.15% and only slightly lower than our benchmark estimates. Overall, the results show that the positive dual-listing premium is robust across various CCS subsamples and sample periods.

[Place Table 5 about here]

4.2.2 Other Policy Dates

Alternative policy dates. As explained in Section 4.1.1, we choose the SEC's release of final amendments to HFCAA implementation as the policy date. Considering that the cross-border regulatory conflicts between the U.S. and China have lasted long time, many different milestones have been reached in this lengthy process, which could have a similar impact on the underlying CCS. We investigate the effects of several alternative milestone dates on CCS returns with and without HKEX dual-listing status.

The first three columns of Table 6 present the results using the $[-90, 90]$-day window around each of the three alternative policy shocks. Column (1) reports the result of using the U.S. Senate passing the bill on 2020/5/20 as the policy shock; Column (2) uses the bill-effective date of 2020/12/18 as the event date; and Column (3) uses the SEC's first release of the provisional list on 2022/3/10 as the event.[22] Following the bill-passed and the bill-effective dates, the HKEX dual-listed CCS and U.S.-listed-only CCS do not experience different returns. The estimated coefficients are -8.36% and 4.14%, respectively, and not statistically significant. After the release of the provisional list by the SEC, dual-listed CCS actually perform worse compared to U.S.-listed-only CCS with an estimate of 11.52% lower adjusted return. One possible explanation for the relatively lower returns is that those U.S.-listed-only CCS were heavily shorted around the release of the provision list, which coincides with the Federal's tightening monetary policy, leading to the "short-squeezing" type of phenomenon as documented in Richardson, Saffi, and Sigurdsson (2017).

Placebo tests. As discussed in Section 4.1.1, there are several other important regulatory policy announcements during our sample period, which have large price impact on the CCS

[22] According to the SEC's document, the first set of provisional list becomes effective from 2022/3/8. But the list was released during market hour on 2022/3/10. Therefore, we chooses 2022/3/9 as the last day of the pre-event day.

and may confound our results. To alleviate this concern, we conduct a placebo test using one of the most influential regulatory policy events in our sample period – the announcement of the "Double Reduction" policy targeting the off-campus K-9 tutoring sector on 2021/7/24.[23] While the event itself has a large negative impact on many CCS, we expect no DID effect between the treated and control groups because the policy does not depend on the listing status of CCS.[24] The estimate of the placebo test is reported at Columns (4) of Table 6. We find no significant abnormal return difference between CCS with and without dual listing around the announcement of "Double Reduction". The placebo test suggests that our main findings are unlikely driven by other concurrent events that are unrelated to the delisting risk of CCS in the U.S.

[Place Table 6 about here]

4.2.3 Additional Effects on Depository, Trading and Liquidity

Depository and trading We first examine the impact of the policy on the depository and trading of CCS listed in the U.S. market. The top panel of Figure 6 compares the depository locations for the sample of all U.S.-listed CCS, including both dual-listed and U.S.-listed-only CCS. Since April 2018, when the first U.S.-listed CCS became dual-listed at HKEX, the proportion of CCS shares (Panel A) and market value (Panel B) held in U.S. custody have been steadily declining. As of April 2022, 15% of the total CCS shares are deposited at Hong Kong, accounting for almost half of the total market capitalization of U.S.-listed CCS. The depository pattern is consistent with our hypothesis that HKEX provides an important safe harbor for dual-listed CCS, allowing their investors to transfer holdings to Hong Kong amid heightened delisting risk in the U.S..

The bottom panel of Figure 6 compares the trading volume of CCS on the U.S. exchanges and HKEX. We find a striking decline in the trading activities of dual-listed CCS at the U.S. exchanges, with a market share that decreases from 100% to approximately 60% in terms of both share and dollar volume. Overall, the evidences suggest that investors have gradually shifted their trading and depository from the U.S. to Hong Kong, a process which has accelerated in light of the increased risk of de-listing from the U.S. exchanges following the passage of the HFCAA.

[23] Another possible placebo policy event is the regulatory investigation on the Chinese ride-hailing giant Didi on 2021/7/2, which raises fears of strong government interventions in all mega-cap platform companies. Because these two events occurred less than three weeks apart, we decide to focus on the "Double Reduction" as the policy cracks down the entire education industry with a size of approximately USD 500 billion (Guo, 2022). The estimation results are quite similar if we use the Didi event date for the placebo test.

[24] For this placebo test, we exclude the CCS that belong to the Wind U.S. Education Concept Index becuase these companies are directly affected by the "Double Reduction" policy shock.

Liquidity. Next, we investigate the impact of the policy on the market liquidity, focusing on the difference between dual-listed and U.S.-listed-only CCS. Conceptually, the liquidity impact of the SEC's release is manifold. On one hand, investors and market makers may no longer want to hold U.S.-listed-only CCS amid heightened delisting risk, leading to lower liquidity for these CCS. On the other hand, investors have strong incentive to transfer their holdings from the U.S. to Hong Kong, which could result in lower liquidity for dual-listed CCS in the US market. We examine which of the two mechanisms dominates in an empirical setting similar to our baseline DID specification.

We use three liquidity measures: 1) daily dollar-weighted effective spread (Holden and Jacobsen, 2014); 2) daily high-minus-low spread; and 3) daily five-minute intraday return volatility. All liquidity measures are expressed in percentage. We use a similar DID specification as in the main analysis.

[Place Table 7 about here]

Table 7 presents the results. The effects of the policy shock on the liquidity of CCS is quite mixed. The effective spread is 0.04% larger for U.S.-listed-only CCS after the policy shock. Though statistically significant at the 5% level, it only accounts for a small portion (3.5%) of the average effective spreads of CCS during the sample period. For intra-day high-low spread and volatility, the DID coefficients are negative, but neither is statistically significant.

4.3 The Impact on the Hong Kong Market

In this section, we compare the market performance of dual-listed CCS with similar HKEX-listed-only CCS to examine the impact of the policy shock on the Hong Kong market. For dual-listed CCS, even though their HKEX listing status provides critical protection, losing access to the U.S. capital market would still have a significant impact on them given the central role of the U.S. in the global financial markets. The HKEX-listed-only CCS, on the other hand, are not directly affected by the policy shock.

For our tests, we match dual-listed CCS with HKEX-listed-only stocks with similar firm characteristics. Specifically, a HKEX-listed-only stock is considered to be matched with a dual-listed CCS if 1) the majority of its business is in mainland China; 2) it is not an SOE; 3) it belongs to the same Wind first-level industry classification, 4) the absolute market capitalization difference ranks top three. Dual-listed CCS are assigned to the treatment group while their matched peers are assigned to the control group. Table 8 reports the results with model specifications similar to our main results. We do not include size-related fixed effects here because all stocks of both treatment and control groups belong to the

largest size quintile.

[Place Table 8 about here]

As shown in Table 8, we find that the dual-listed CCS perform statistically and economically worse than their matched HKEX-listed-only peers, with a magnitude of -10% to -7% depending on the model specification. That is, while dual-listed CCS experience smaller adverse impact than those listed only in the U.S. market, they still under-perform their peers that listed only on the Hong Kong exchange.

5 Conclusion

In this paper, we quantify the economic value of dual-listing on international exchanges, using the SEC's adoption of the final amendments to implement the mandates of the HFCAA on December 2, 2021 as a natural experiment. Using a difference-in-differences approach, we compare the market reactions for U.S.-listed CCS with and without the pre-shock HKEX dual-listing status. We find that those dual-listed CCS have on average 14.88% higher cumulative returns, or USD 8 billion in market capitalization, than their peers without the dual-listing status during a three-month period after the policy shock. Our results are robust to a battery of confounding effects and subsamples. Our findings underscore the regulatory risk faced by firms listed abroad, a type of risk that is often overlooked in the literature but could have a significant and large economic impact at the current international context.

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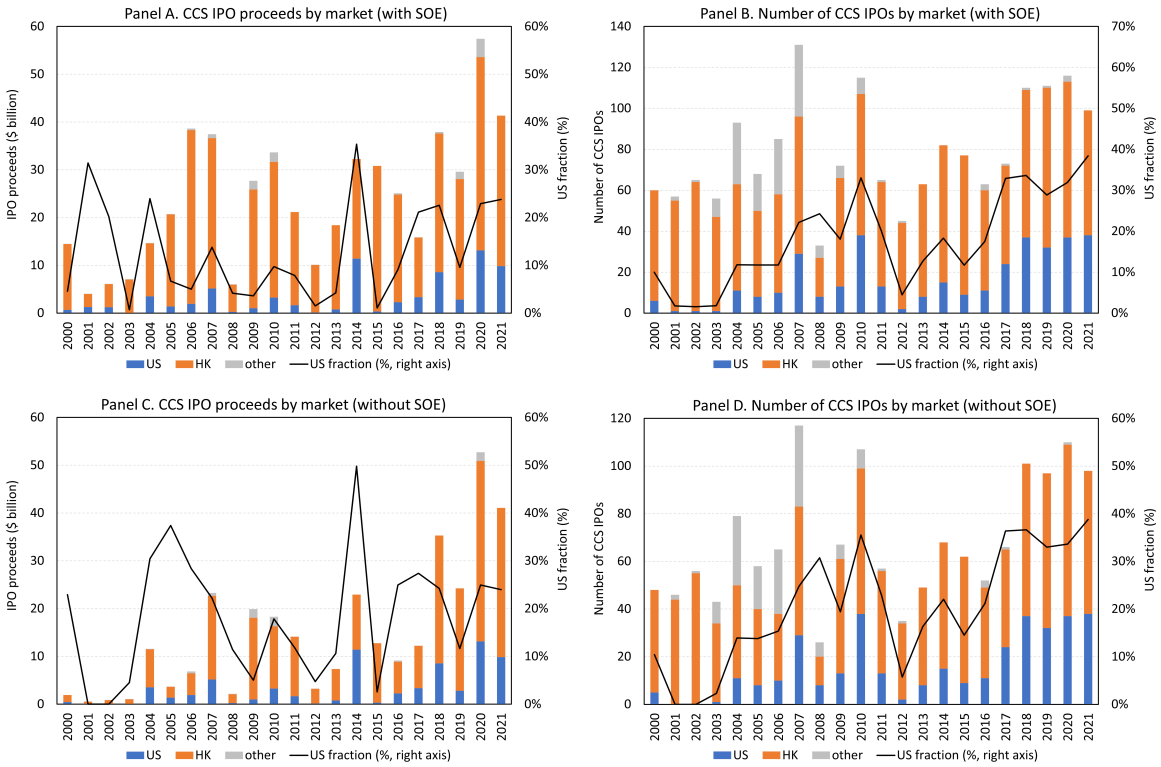


Figure 1: CCS IPO proceeds raised by market

The figure plots the proceeds (in billion USD) and numbers of China Concepts Stocks' initial public offerings by market from 2000 to 2021. Panels A and B include SOE while Panels C and D exclude SOE. We plot the U.S. fraction of all markets (the right scale) for each panel. Data on IPOs are from the Wind database.

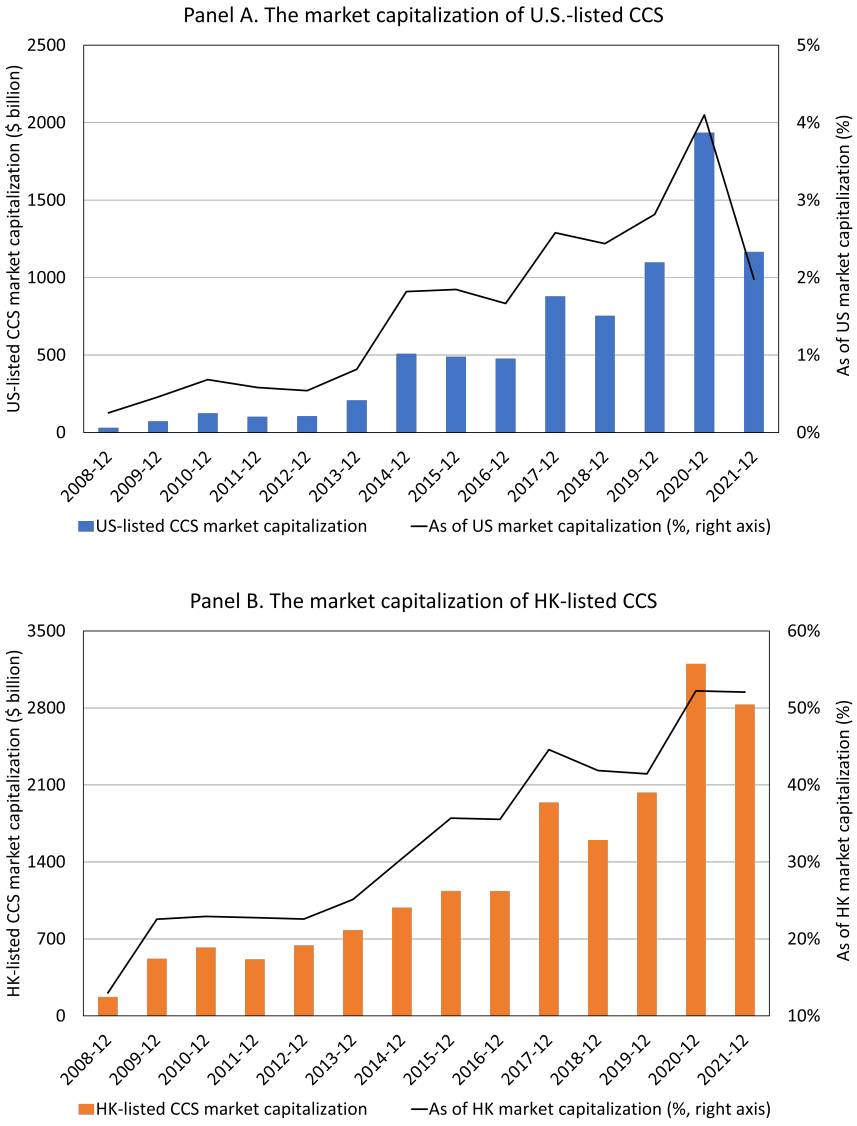


Figure 2: The market capitalization of U.S.-listed and HK-listed CCS

The figure plots the total market capitalization of China Concepts Stocks (CCS) excluding SOE listed on the U.S. exchanges and HKEX, respectively. The sample spans from 2008 to 2021. Panel A plots the aggregate market capitalization of U.S.-listed CCS, both in terms of billion dollar and as a fraction of the total U.S. market capitalization including all shares listed on NYSE, NASDAQ and AMEX (the right scale) at the end of each year. Panel B plots the aggregate market capitalization of HKEX-listed only CCS, both in terms of billion dollar and as a fraction of the total Hong Kong market capitalization including all shares listed on main board and GEM of the HKEX (the right scale) at the end of each year. Data on the total U.S. market capitalization are from the CRSP database. Data on the market capitalization of CCS and the total Hong Kong market capitalization are from the Wind database.

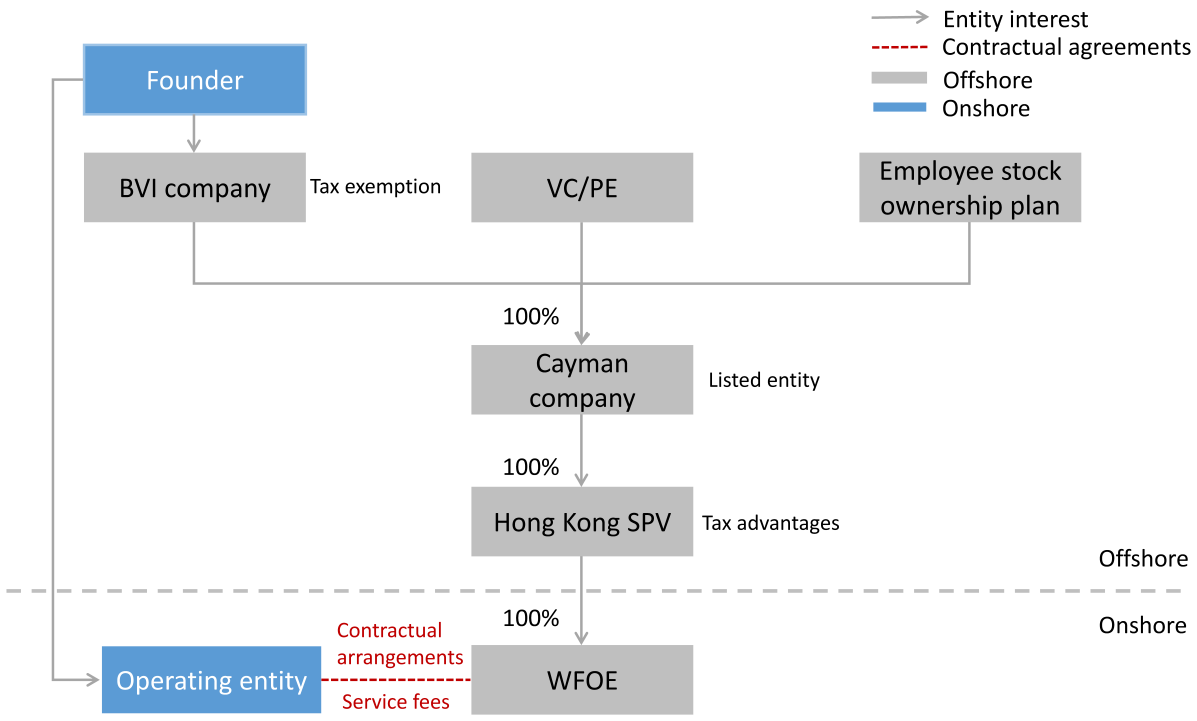


Figure 3: VIE structure

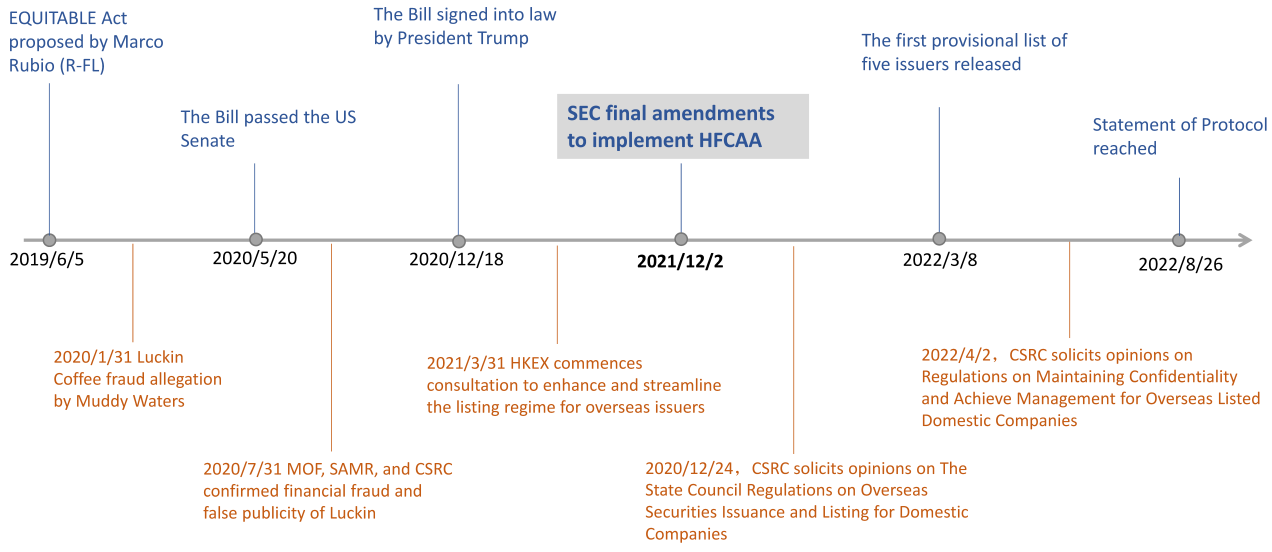


Figure 4: Timeline of the HFCAA

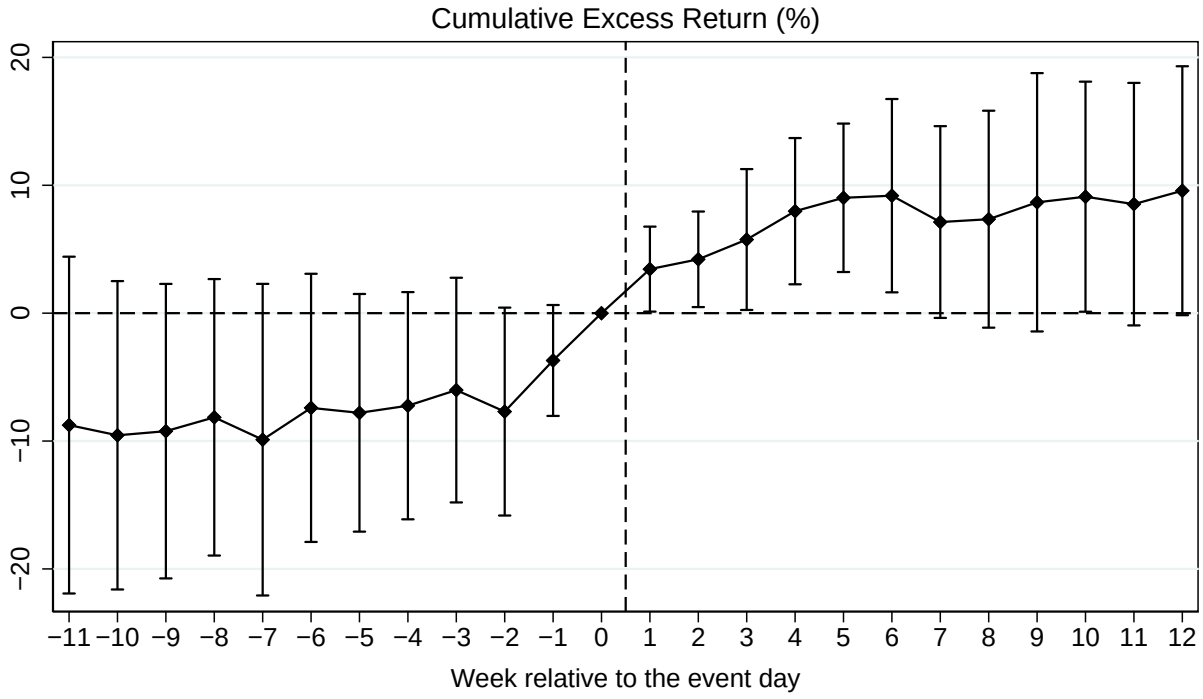


Figure 5: Dynamic treatment effects of the policy shock

This figure plots the estimated coefficients of D_t^k along with their confidence intervals calculated from standard errors clustered by firm in the diff-in-diff specification of Eq. (2). The dependent variable is the cumulative excess return. Treated firms include U.S.-listed CCS with HKEX dual listing as of 2021/12/1 and control firms include U.S.-listed CCS without HKEX dual listing as of 2021/12/1. We add controls including TED spread, the Hong Kong market return as well as VIX. The sample period from 2021/9/4 to 2022/3/3 is divided into twenty-two 7-day subperiods from $k = -10$ to $k = 11$ and two subperiods, i.e., $k = -11$ and $k = 12$ for the rest. We also add firm fixed effects and three-dimension interactive fixed effects across industry, size, and week. The point estimate immediately before the event date is normalized to zero. The dotted line indicates the event on 2021/12/2.

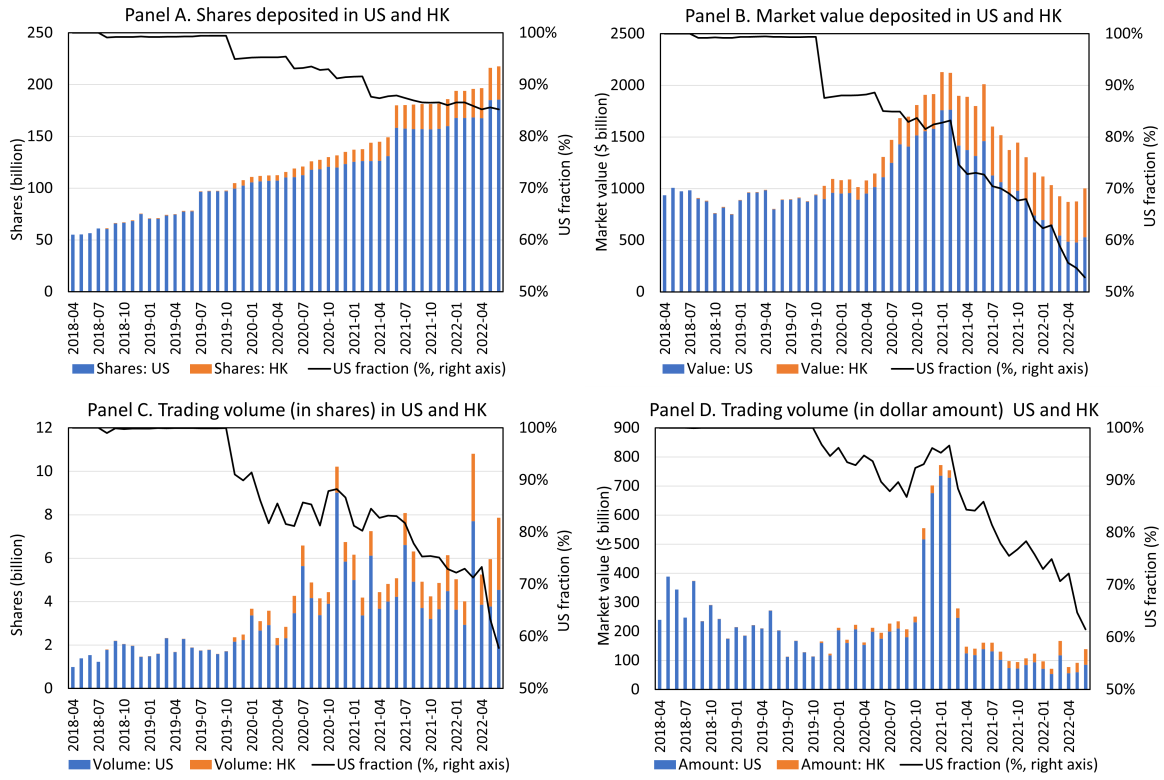


Figure 6: The impact on CCS share depository and trading amount

The figure plots the impact of the policy shock on CCS share depository and trading. For U.S.-listed CCS, Panel A plots ADR holdings in custody on the US exchanges and Hong Kong share holdings in custody on the HKEX along with the U.S. fraction (the right scale). Panel B plots the holding market value in custody on the US exchanges and HKEX along with the U.S. fraction (the right scale). Panels C and D plot the trading volume in shares and dollar amount in custody on the US exchanges and the HKEX, respectively. Shares deposited in HKEX are from Central Clearing and Settlement System (CCASS).

Table 1: Summary Statistics

This table presents summary statistics of key dependent variables including cumulative excess returns (CER, in %), cumulative abnormal returns with respect to CAPM and Fama-French three-factor model (CAR, in %), daily dollar-weighted effective spreads (ES, in %), daily high-minus-low spreads (HLS, in %), and five-minute return volatility (VOL, in %). Marco-related variables include the TED spread (TED, in %), the Hong Kong Hang Seng market return (Mkt_{hk}, in %), and CBOE Volatility Index (VIX). Firm-level characteristics include average values of market capitalization ($Size$, in USD billion), book-to-market ratio (BM), firm leverage ($Leverage$), ROE (ROE), market beta ($Beta$), and institutional ownership ($InstOwn$, in %). Accounting-related variables are measured as of 2020/12/31, market beta is estimated using a 252-day window before the [−90, +90] window, and the institutional ownership is measured as of 2021/9/30. Summary statistics include the number of observations, the mean, the standard deviation, the 10th percentile, the 25th percentile, the median, the 75th percentile and the 90th percentile. $Treat$ indicates U.S.-listed CCS with HKEX dual listing as of 2021/12/1 while $Control$ indicates U.S.-listed CCS without HKEX dual listing as of 2021/12/1. The sample period is from 2021/9/4 to 2022/3/1.

Variable	N	Mean	STD	P10	P25	Median	P75	P90
Dependent variables								
CER	25579	-23.29	26.57	-59.24	-42.05	-21.78	-6.40	5.68
CER^{Treat}	2196	-14.50	18.38	-39.16	-26.33	-10.74	-1.72	6.29
$\text{CER}^{Control}$	23383	-24.12	27.07	-60.25	-43.60	-22.80	-7.35	5.60
CAR_{CAPM}	25579	-22.62	26.54	-58.18	-41.86	-21.31	-5.14	6.08
$\text{CAR}^{Treat}_{CAPM}$	2196	-13.62	18.25	-37.34	-25.65	-9.91	0.15	6.74
$\text{CAR}^{Control}_{CAPM}$	23383	-23.47	27.04	-59.07	-43.39	-22.32	-5.90	5.99
CAR_{FF3}	25579	-14.79	29.21	-50.16	-33.61	-15.03	-0.03	16.52
CAR^{Treat}_{FF3}	2196	-4.49	22.32	-30.39	-19.44	-5.54	5.84	22.40
$\text{CAR}^{Control}_{FF3}$	23383	-15.75	29.60	-51.29	-35.11	-16.10	-0.71	15.79
ES	24862	1.13	1.602	0.12	0.25	0.72	1.45	2.47
HLS	25494	7.71	5.511	3.13	4.49	6.45	9.37	13.26
Vol	24850	8.60	6.982	2.79	4.03	6.39	10.94	17.12
Marco-related variables								
TED	25579	0.10	0.0334	0.07	0.08	0.10	0.13	0.15
MKT_{hk}	25579	-0.09	1.287	-1.64	-1.07	0.02	0.72	1.35
VIX	25579	21.20	4.601	16.31	17.66	19.73	23.85	28.62
Firm-level characteristics								
Size	213	8.92	48.88	0.03	0.05	0.26	1.79	13.70
BM	213	0.86	1.798	0.01	0.13	0.33	0.92	2.17
Leverage	213	0.56	0.665	0.14	0.24	0.44	0.64	0.93
ROE	213	-0.15	2.093	-0.70	-0.29	-0.03	0.11	0.36
Beta	213	1.21	1.283	0.35	0.75	1.18	1.67	2.28
InstOwn	213	14.00	17.04	0.43	1.28	5.57	21.55	42.21

Table 2: Comparison and Potential Determinants of HKEX Dual-Listing

The table presents the comparison between HKEX dual-listed and US-listed-only CCS as well as the potential determinants of U.S.-listed CCS with HKEX dual-listing. Panel A reports the mean value of market capitalization ($Size$, in billion dollar), institutional ownership ($InstOwn$, in %), book-to-market ratio (BM), firm leverage computed as the total liability over total assets ($Leverage$), and annualized ROE (ROE) among the U.S.-listed CCS with HKEX dual-listing and U.S.-listed-only CCS, respectively. The last column reports the difference in mean values between the two groups with the standard errors in parentheses. Panel B reports the potential determinants of HKEX dual-listing among U.S.-listed CCS in our sample using linear regressions of dual-listing dummy on firm characteristics including the natural logarithm of firm size, book-to-market ratio, firm leverage, annualized ROE, and institutional ownership. Standard errors are reported in parentheses. The symbols *, **, and *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A. Comparison between U.S.-listed CCS with HKEX dual-listing and US-listed-only CCS

Variables	Treat	Control	Difference
Size ($ Billion)	66.62	3.59	63.03***
			(11.26)
BM	0.24	0.92	-0.68
			(0.44)
Leverage	0.38	0.58	-0.20
			(0.16)
ROE (Annual)	-0.02	-0.16	0.14
			(0.52)
Beta	1.08	1.22	-0.14
			(0.32)
Inst Own (%)	43.21	11.30	31.88***
			(3.59)

Panel B. Determinants of U.S.-listed CCS with HKEX dual-listing

Dependent: Treat	(1)	(2)	(3)	(4)	(5)	(6)
Ln(Size)	6.42***					4.25***
	(1.12)					(1.56)
BM		-1.64***				0.46
		(0.46)				(0.44)
Leverage			-3.49**			-0.44
			(1.64)			(1.29)
ROE				0.24		-0.21
				(0.25)		(0.18)
InstOwn					0.85***	0.45**
					(0.16)	(0.21)
R-square	0.29	0.01	0.01	0.00	0.27	0.33
N	213	213	213	213	213	213

Table 3: Market Reactions to the SEC Final Amendments: Difference-in-Differences

The table reports the difference-in-differences estimation of market reactions to the SEC final amendments on 2021/12/2. The sample period is from 2021/9/4, to 2022/3/1. The dummy *Treat* takes a value of one for dual-listed CCS as of 2021/12/1. The dummy *Post* equals one from 2021/12/2. The dependent variables are daily cumulative excess returns in Columns (1) to (6), cumulative abnormal returns (CAR) with respect to CAPM in Column (7), and CAR with respect to the Fama-French three-factor model in Column (8). CAR are estimated using a 252-day window with a minimum observation requirement of 150 days. All dependent variables (in %) are winsorized at 1% and 99%. Macro-related control variables include TED spread, the Hong Kong market return, and VIX in Columns (2) to (8). We use NYSE breakpoints to sort CCS into five groups according to their market capitalization as of 2020/12/31. We include firm and week fixed effects separately without and with controls in Columns (1) and (2); firm and industry×week fixed effects in Column (3); firm and size×week fixed effects in Column (4); firm, industry×week, and size×week fixed effects in Column (5); and firm and industry×size×week fixed effects in Column (6) to (8). Standard errors clustered by firm are reported in parentheses in all specifications. The symbols *, **, and *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

Dependent:	CER						CAR_{CAPM}	CAR_{FF3}
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treat × Post	11.82***	11.82***	11.97***	8.39**	9.75**	14.88***	15.30***	13.83**
	(2.97)	(2.97)	(2.86)	(3.94)	(3.91)	(3.46)	(3.63)	(5.85)
TED		-7.29***	-7.29***	-7.27***	-7.27***	-7.26***	-5.31***	-7.19***
		(1.40)	(1.40)	(1.40)	(1.40)	(1.42)	(1.44)	(1.73)
MKT_{hk}		0.33***	0.33***	0.33***	0.33***	0.33***	0.27***	0.38***
		(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)
VIX		-0.44***	-0.44***	-0.44***	-0.44***	-0.44***	-0.04	-0.09***
		(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
Firm FE	✓	✓	✓	✓	✓	✓	✓	✓
Week FE	✓	✓	–	–	–	–	–	–
Industry × Week FE	–	–	✓	–	✓	–	–	–
Size × Week FE	–	–	–	✓	✓	–	–	–
Industry × Size × Week FE	–	–	–	–	–	✓	✓	✓
R-square	0.76	0.76	0.77	0.77	0.78	0.80	0.79	0.73
N	25,579	25,579	25,579	25,579	25,579	25,579	25,579	25,579

Table 4: Market Reaction to the SEC Final Amendments: DID Estimation for Alternative Treatment and Control Groups

The table reports the difference-in-differences estimation of market reactions to the SEC final amendments on 2021/12/2 using alternative treatment and control groups. The sample period is from 2021/9/4, to 2022/3/1. The dummy *Post* equals one from 2021/12/2. We indicate the treatment group of dual-listed CCS as Group 1. We divide the control group into two subgroups, i.e., firms that are not HK-listed but qualified for dual listing (Group 2) and firms that are unqualified for dual listing (Group 3). The dependent variables are CAR (in %) with respect to the Fama-French three-factor model, which are estimated using a 252-day window with a minimum observation requirement of 150 days, and winsorized at 1% and 99%. We include firm fixed effects, three-dimension interactive fixed effects across industry, size, and week, and macro-related control variables including TED spread, the Hong Kong market return, and VIX. Standard errors clustered by firm are reported in parentheses in all specifications. The symbols *, **, and *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

Treat Control	Group 1 Group 2	Group 1 Group 3	Groups 1& 2 Group 3	Group 2 Group 3
	(1)	(2)	(3)	(4)
Treat × Post	13.43**	18.56*	9.73	5.62
	(5.96)	(9.99)	(6.95)	(5.61)
TED	-14.28***	-5.44***	-7.19***	-6.76***
	(2.59)	(1.93)	(1.73)	(1.88)
MKT_{hk}	0.57***	0.34***	0.38***	0.36***
	(0.05)	(0.03)	(0.03)	(0.03)
VIX	-0.19***	-0.06	-0.09***	-0.09**
	(0.04)	(0.04)	(0.03)	(0.04)
Firm FE	✓	✓	✓	✓
Industry × Size × Week FE	✓	✓	✓	✓
R-square	0.78	0.73	0.73	0.73
N	6,588	21,187	25,579	23,383

Table 5: Market Reactions to the SEC Final Amendments: DID Estimation for Additional Results

The table reports the difference-in-differences estimation of market reactions to the SEC final amendments on 2021/12/2 for additional results. The sample period is from 2021/9/4, to 2022/3/1. Column (1) restricts the sample to CCS above the median market capitalization as of 2021/9/3, i.e., the weekday right before the event window. The sample excludes weeks 1 to 4 post the event date in Column (2), and only keep CCS with WVR structure in control group in Column (3). Column (4) presents the result of a longer event window that is twelve months around the event date. The dependent variables are CAR (in %) with respect to the Fama-French three-factor model, which are estimated using a 252-day window with a minimum observation requirement of 150 days, and winsorized at 1% and 99%. We include firm fixed effects, three-dimension interactive fixed effects across industry, size, and week, and market-level control variables including TED spread, the Hong Kong market return, and VIX. Standard errors clustered by firm are reported in parentheses in all specifications. The symbols *, **, and *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

Dependent:	Large	Excl. week 1-4	Keep WVR	[−6, 6]-month
CAR FF3	(1)	(2)	(3)	(4)
Treat × Post	13.83**	14.85**	13.50**	12.15**
	(5.91)	(6.80)	(5.90)	(6.12)
TED	-9.27***	-6.77***	-10.01***	-4.28***
	(2.08)	(1.75)	(2.68)	(0.75)
MKT_{hk}	0.45***	0.36***	0.44***	0.25***
	(0.04)	(0.03)	(0.04)	(0.02)
VIX	-0.14***	-0.15***	-0.14***	-0.11***
	(0.03)	(0.04)	(0.04)	(0.02)
Firm FE	✓	✓	✓	✓
Industry × Size × Week FE	✓	✓	✓	✓
R-square	0.81	0.71	0.83	0.77
N	12,728	21,608	10,921	50,834

Table 6: DID Estimation: Placebo Tests

The table reports the difference-in-differences estimation of market reactions to alternative policy dates and other regulatory changes. The sample period is a [−90, +90]-day window around the event date in each column: the bill passing the U.S. Senate on 2020/5/20 in Column (1), the bill signing into law on 2020/12/18 in Column (2), the SEC's first release of the provisional list on 2022/3/10 in Column (3), and the announcement of "Double reduction" policy on 2021/7/24 in Column (4). The dependent variables are cumulative abnormal returns with respect to the Fama-French three-factor model, which are estimated using a 252-day window with a minimum observation requirement of 150 days, and winsorized at 1% and 99%. We include firm fixed effects, three-dimension interactive fixed effects across industry, size, and week, and market-level control variables including TED spread, the Hong Kong market return as well as VIX. Standard errors clustered by firm are reported in parentheses in all specifications. The symbols *, **, and *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

Dependent:	Senate	Effective	Provisional	DR
CAR FF3	(1)	(2)	(3)	(4)
Treat × Post	-8.36	4.14	-11.52***	5.80
	(9.12)	(10.30)	(4.06)	(5.90)
TED	-2.40	65.92***	-5.30***	1.96
	(1.56)	(12.80)	(1.20)	(5.68)
MKT_{hk}	-0.08**	0.37***	0.26***	0.26***
	(0.03)	(0.07)	(0.03)	(0.03)
VIX	0.16***	-0.74***	-0.01	0.01
	(0.03)	(0.08)	(0.04)	(0.03)
Firm FE	✓	✓	✓	✓
Industry × Size × Week FE	✓	✓	✓	✓
R-square	0.66	0.75	0.73	0.76
N	20,313	22,072	25,363	22,880

Table 7: Other Effects of the SEC Final Amendments: DID Estimation

The table reports the difference-in-differences estimation of other effects of the SEC final amendments on 2021/12/2. The sample period is from 2021/9/4, to 2022/3/1. The dependent variables are as follows and in %: daily dollar-weighted effective spreads in Column (1), daily high-minus-low spread in Column (2), and five-minute return volatility within each day in Column (3). Firms with missing values in relevant data in the TAQ database are not included in Columns (1) and (3). We include firm fixed effects, three-dimension interactive fixed effects across industry, size, and week, and market-level control variables including TED spread, the Hong Kong market return, and VIX. Standard errors clustered by firm are reported in parentheses in all specifications. The symbols *, **, and *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

Dependent:	ES	High-Low	Vol
	(1)	(2)	(3)
Treat × Post	-0.04**	-0.38	-0.11
	(0.01)	(0.30)	(0.16)
TED	-0.42	1.20	0.37
	(0.29)	(1.50)	(1.58)
MKT_{hk}	-0.02***	-0.10***	-0.14***
	(0.00)	(0.02)	(0.02)
VIX	0.01***	0.18***	0.14***
	(0.00)	(0.02)	(0.01)
Firm FE	✓	✓	✓
Industry × Size × Week FE	✓	✓	✓
R-square	0.68	0.31	0.65
N	24,862	25,494	24,850

Table 8: Market Reactions Relative to Matched Hong Kong Listed Stocks: DID Estimation

The table reports the difference-in-differences estimation of dual-listed CCS market reactions relative to matched HK-listed-only stocks to the SEC final amendments on 2021/12/2. The sample period is from 2021/9/4, to 2022/3/1. The dummy *Treat* takes a value of one for dual-listed CCS as of 2021/12/1 and zero for the matched HK-listed-only CCS stocks, which belong to the same Wind first-level industry classification, have the smallest three absolute market capitalization difference compared to the dual-listed ones, and are not SOE. The dummy *Post* equals one from 2021/12/2. All returns are from Hong Kong stock market. The dependent variables are daily cumulative excess returns in Columns (1) to (3), cumulative abnormal returns (CAR) with respect to CAPM in Column (4), and CAR with respect to the Fama-French three-factor model in Column (5). CAR are estimated using a 252-day window with a minimum observation requirement of 150 days. Asia Pacific excluding Japan three factors are obtained from Kenneth French's data library. All dependent variables (in %) are winsorized at 1% and 99%. Macro-related control variables include TED spread, the Hong Kong market return, and VIX in Columns (2) to (5). We include firm and week fixed effects separately without and with controls in Columns (1) and (2); firm and industry×week fixed effects in Column (3) to (5). Standard errors clustered by firm are reported in parentheses in all specifications. The symbols *, **, and *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

Dependent:	CER			CAR_{CAPM}	CAR_{FF3}
	(1)	(2)	(3)	(7)	(8)
Treat × Post	-6.65*	-6.65*	-6.67**	-7.10*	-10.04**
	(3.74)	(3.74)	(3.26)	(3.70)	(3.99)
TED		-15.93***	-15.93***	-4.58***	-8.33***
		(1.47)	(1.48)	(1.54)	(1.64)
MKT_{hk}		0.42***	0.42***	0.27***	0.28***
		(0.05)	(0.06)	(0.05)	(0.05)
VIX		-0.11***	-0.11***	0.15***	0.19***
		(0.03)	(0.03)	(0.03)	(0.04)
Firm FE	✓	✓	✓	✓	✓
Week FE	✓	✓	–	–	–
Industry × Week FE	–	–	✓	✓	✓
R-square	0.76	0.76	0.80	0.75	0.74
N	5,244	5,244	5,244	5,160	5,160

Appendix

Table A1: List of US and Hong Kong dual-listed CCS as of 2021/12/1

Company Name	US Ticker	HK Ticker	Dual-listing date	Type
BeiGene	BGNE	6160.HK	2018-08-08	Primary
Alibaba	BABA	9988.HK	2019-11-26	Secondary
NetEase	NTES	9999.HK	2020-06-11	Secondary
JD.com	JD	9618.HK	2020-06-18	Secondary
Yum China	YUMC	9987.HK	2020-09-10	Secondary
H World	HTHT	1179.HK	2020-09-22	Secondary
Zai Lab	ZLAB	9688.HK	2020-09-28	Secondary
Baozun	BZUN	9991.HK	2020-09-29	Secondary
ZTO Express	ZTO	2057.HK	2020-09-29	Secondary
GDS	GDS	9698.HK	2020-11-02	Secondary
New Oriental	EDU	9901.HK	2020-11-09	Secondary
Autohome	ATHM	2518.HK	2021-03-15	Secondary
Baidu	BIDU	9888.HK	2021-03-23	Secondary
Bilibili	BILI	9626.HK	2021-03-29	Secondary
Trip.com	TCOM	9961.HK	2021-04-19	Secondary
Hutchmed	HCM	0013.HK	2021-06-30	Primary
Xpeng	XPEV	9868.HK	2021-07-07	Primary
Li Auto	LI	2015.HK	2021-08-12	Primary

Table A2: Variable definition

Variables	Definition	Source
Dependent variables		
CER	Cumulative excess returns	CRSP
CAR_{CAPM}	Cumulative abnormal returns estimated with respect to CAPM using a 252-day window with a minimum observation requirement of 150 days	CRSP
CAR_{FF3}	Cumulative abnormal returns estimated with respect to the Fama-French three-factor model using a 252-day window with a minimum observation requirement of 150 days	CRSP
ES	Daily dollar-weighted effective spread	TAQ
HLS	Daily high-minus-low spread	CRSP
Vol	Daily five-minute return volatility	TAQ
$\Delta\#Inst$	Change in the number of institutional investors scaled by the average number of institutions holding stocks in the same market capitalization quintile at the beginning of the period	Wind
Macro variables		
Ted	The difference between the three-month T-bill and the LIBOR rate	Federal Reserve of St-Louis FRED database
Mkt_{hk}	Hong Kong Hang Shen Index return	Wind
VIX	CBOE Volatility Index	Federal Reserve of St-Louis FRED database
Firm-level characteristics		
Size	Total market capitalization	Wind
BM	Book to market ratio as of 2020/12/31	Compustat, Wind
Leverage	Total liabilities over total assets as of 2020/12/31	Compustat, Wind
ROE	Net income over book equity as of 2020/12/31	Compustat, Wind
InstOwn	The percentage of shares held by institutional investors	Wind

Table A3: Difference-in-Differences: Two-way Cluster

The table reports the difference-in-differences estimation of market reactions to the SEC final amendments on 2021/12/2. The sample period is from 2021/9/4, to 2022/3/1. The dummy *Treat* takes a value of one for dual-listed CCS as of 2021/12/1. The dummy *Post* equals one from 2021/12/2. The dependent variables are daily cumulative excess returns in Columns (1) to (6), cumulative abnormal returns (CAR) with respect to CAPM in Column (7), and CAR with respect to the Fama-French three-factor model in Column (8). CAR are estimated using a 252-day window with a minimum observation requirement of 150 days. All dependent variables (in %) are winsorized at 1% and 99%. We add market-level control variables including TED spread, the Hong Kong market return as well as VIX in Columns (2) to (8). We include firm and week fixed effects separately without and with controls in Columns (1) and (2); firm and industry×week fixed effects in Column (3); firm and size×week fixed effects in Column (4); firm, industry×week, and size×week fixed effects in Column (5); and firm and industry×size×week fixed effects in Column (6) to (8). Standard errors clustered by firm and event week are reported in parentheses in all specifications. The symbols *, **, and *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

Dependent:	Excess						CAPM	FF3
CAR	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treat × Post	11.82***	11.82***	11.97***	8.39**	9.75**	14.88***	15.30***	13.83**
	(3.05)	(3.04)	(2.95)	(3.87)	(3.82)	(3.39)	(3.58)	(5.69)
TED		-7.29	-7.29	-7.27	-7.27	-7.26	-5.31	-7.19
		(7.79)	(7.78)	(7.78)	(7.78)	(7.78)	(7.52)	(7.92)
MKT_{hk}		0.33***	0.33***	0.33***	0.33***	0.33***	0.27**	0.38***
		(0.11)	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)	(0.13)
VIX		-0.44***	-0.44***	-0.44***	-0.44***	-0.44***	-0.04	-0.09
		(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.06)	(0.07)
Firm FE	✓	✓	✓	✓	✓	✓	✓	✓
Week FE	✓	✓	–	–	–	–	–	–
Industry × Week FE	–	–	✓	–	✓	–	–	–
Size × Week FE	–	–	–	✓	✓	–	–	–
Industry × Size × Week FE	–	–	–	–	–	✓	✓	✓
R-square	0.76	0.76	0.77	0.77	0.78	0.80	0.79	0.73
N	25,579	25,579	25,579	25,579	25,579	25,579	25,579	25,579

Table A4: Consolidated Main Board Listing Rules on the HKEX before / after the 2018 reform

Effective date	Before April 30, 2018			April 30, 2018-December 31, 2021
Requirement	Rule1	Rule2	Rule3	
Profits	Not less than HK$20 million for the latest year, and not less than HK$30 million during the 2 years prior to the latest year	/	/	A Biotech Company with a Biotech Product that is evaluated and approved by a Competent Authority based on data derived from clinical trials can be exempt from other financial requirements when: 1) Market capitalization more than HK$1.5 billion; 2) At least 2-year operating history in the field; 3) Available working capital for 125% of the groups present requirements, that is for at least the next 12 months; 4) third party investment as a percentage of 1% to 5%; 5) A portion of the total number of its issued shares with a market capitalization of at least HK$375 million held by the public at the time of its initial listing.
Revenue	/	Not less than HK$500 million for the latest year	Not less than HK$500 million for the latest year	
Cash Flows	/	Not less than HK$100 million for the most recent 3 years	/	
Market capitalization	/	Not less than HK$2 billion	Not less than HK$4 billion	
Percentage of public float	Not less than 25%, and more than HK$50 million			Not less than 25%, and more than HK$125,000,000
Operating history	3 years			3 years
WVR structure	Prohibited			Allowed with additional requirements: 1) Innovative Company; 2) Market capitalization not less than HK$ 40 billion; or market capitalization not less than HK$ 10 billion and profits not less than HK$1 billion for the latest year; 3) A class of shares conferring weighted voting rights in a listed issuer must not entitle the beneficiary to more than ten times the voting power of ordinary shares, and non-WVR shareholders must be entitled to cast at least 10% of the votes.
Secondary listing	A Greater China Issuer is generally prohibited to be secondary listed on the main board.			Allowed with additional requirements: 1) Market capitalization not less than HK$ 40 billion; or market capitalization not less than HK$ 10 billion and profits not less than HK$1 billion for the latest year; and 2) Primary listed on a Qualifying Exchange on or before 15 December 2017 with a minimum of 2-year track record.

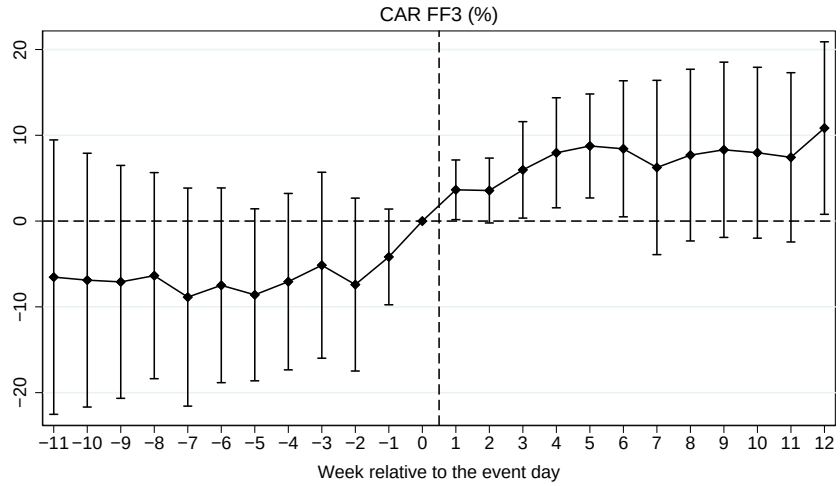
Table A5: List of firms qualified for dual listing as of 2021/12/1

Ticker	Company Name	Industry	WVR	Market Capitalization (billion HK$)	Revenue (billion HK$)
WB	Weibo Corporation	Information Technology	Y	90.79	13.10
NIO	NIO Inc.	Consumer Discretionary	Y	538.47	19.32
BEKE	Ke Holdings Inc.	Real Estate	Y	448.67	83.74
OCFT	Oneconnect Financial Technology Co., Ltd.	Information Technology	N	42.66	3.94
NOAH	Noah Holdings Limited	Financials	N	21.16	3.93
MNSO	Miniso Group Holding Limited	Consumer Discretionary	Y	55.02	9.83
TME	Tencent Music Entertainment Group	Consumer Discretionary	Y	237.02	34.64
QFIN	360 DigiTech,Inc.	Financials	Y	30.04	15.38
KC	Kingsoft Cloud Holdings Limited	Information Technology	N	71.66	7.81
MOMO	Hello Group Inc.	Information Technology	Y	23.73	17.85
DAO	Youdao, Inc.	Consumer Discretionary	Y	22.16	3.76
YSG	Yatsen Holding Limited	Consumer Staples	Y	61.35	6.22
YQ	17 Education & Technology Group Inc.	Consumer Discretionary	Y	10.57	1.54
YALA	Yalla Group Limited	Information Technology	N	21.88	1.05
NIU	Niu Technologies	Consumer Discretionary	Y	20.03	2.90
VIPS	Vipshop Holdings Limited	Consumer Discretionary	N	138.32	121.02
IMAB	I-Mab	Health Care	N	35.71	1.83
VNET	Vnet Group, Inc.	Information Technology	N	29.66	5.74
ACMR	Acm Research, Inc.	Information Technology	Y	13.11	1.21
API	Agora, Inc.	Information Technology	Y	38.21	1.04
CD	Chindata Group Holdings Limited	Information Technology	N	44.08	2.18
JOBS	51job, Inc.	Industrials	N	36.61	4.38
PDD	Pinduoduo Inc.	Consumer Discretionary	Y	1300.00	70.69
LU	Lufax Holding Ltd	Financials	N	238.46	54.81
JKS	Jinkosolar Holding Co., Ltd.	Information Technology	N	17.36	41.74
YY	Joyy Inc.	Information Technology	Y	53.13	15.72
HUYA	Huya Inc.	Information Technology	Y	34.07	12.97
TAL	Tal Education Group	Consumer Discretionary	N	217.19	34.86
HLG	Hailiang Education Group Inc.	Consumer Discretionary	N	9.84	1.62
GHG	Greentree Hospitality Group Ltd.	Consumer Discretionary	Y	9.75	1.10
GOTU	Gaotu Techedu Inc.	Consumer Discretionary	Y	74.70	8.47
DOYU	Douyu International Holdings Limited	Information Technology	N	22.86	11.41
DQ	Daqo New Energy Corp.	Information Technology	N	41.92	5.24
DADA	Dada Nexus Limited	Consumer Discretionary	N	53.85	6.82
IQ	Iqiyi, Inc.	Information Technology	Y	102.21	35.30
CSIQ	Canadian Solar Inc.	Information Technology	N	20.53	26.95

Table A6: The key requirements for the HKEX secondary listing

	Without weighted voting rights (WVR)		With WVR
Stock Exchange of Primary Listing	Recognized Stock Exchanges	Qualifying Exchanges	Qualifying Exchanges
Center of Gravity in Greater China	Generally Prohibited	Permitted	Permitted
"Innovative Company" Requirement	Not Required	Not Required	Required
Minimum Market Capitalization at Listing	HK$ 3 billion	HK$ 3 billion	HK$40 billion or HK$10 billion and revenue of at least HK$1 billion for the most recent audited financial year
Minimum Track Record on Primary Exchange	5 years of listing with good compliance record	5 years of listing with good compliance record (or 2 years of listing with good compliance record if its market capitalization has at least HK$ 10 billion at the time of listing)	2 years of listing with good compliance record

Panel A: Cumulative abnormal return with respect to FF3



Panel B: Cumulative excess return with firm and week fixed effects

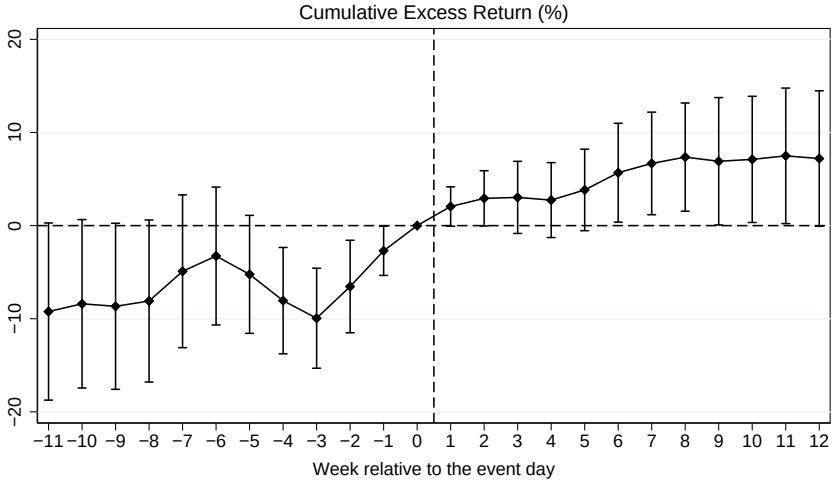


Figure A1: Dynamic Treatment Effects of the Policy Shock

Panel A plots the estimated coefficients of D_t^k along with their confidence intervals calculated from standard errors clustered by firm in the diff-in-diff specification of Eq. (2). The dependent variable is the cumulative abnormal return with respect to the Fama-French three-factor model. We include firm fixed effects, three-dimension interactive fixed effects across industry, size, and week, and market-level control variables including TED spread, the Hong Kong market return, and VIX. Panel B figure plots the estimated coefficients of D_t^k along with their confidence intervals calculated from standard errors clustered by firm in the diff-in-diff specification with firm fixed effects, week fixed effects, and market-level control variables including TED spread, the Hong Kong market return, and VIX. The dependent variable is the cumulative excess return. We include firm fixed effects, week fixed effects, and market-level control variables.