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ABSTRACT

Consistent with reduced expected corruption adding value overall, Chinese shares rise sharply on the December 4th 2012 launch of major anti-corruption reforms, which started by curtailing extravagant spending by or for Party cadres. SOEs gain broadly, consistent with the reform cutting their top managers' (all Party cadres) spending on private benefits. NonSOEs gain in more liberalized provinces, consistent with reduced expected bribes to officials (also Party cadres) for getting business done. NonSOEs lose in provinces where market institutions remain weak, consistent with bribes for "greasing bureaucratic gears" still being a key resource allocation mechanism there. Firm level regressions reveal more productive nonSOEs in more growth potential and external finance-dependent industries gaining more in more liberalized provinces, consistent with investors expecting reduced corruption to complement and perhaps intensify the development of market institutions.

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1. Introduction

Curtailing official corruption is a positive public policy priority in China and many other countries (World Bank 2015). Official corruption impairs public goods provision as officials divert state resources into funding *private benefits*: cash or perks, such as lavish entertainment or travel, for themselves, their friends, families or followers, or third parties in return for favors. Corruption also diverts resources away from productivity-boosting investment and towards political rent seeking as firms pay proliferating *tolls*: bribes to officials for waiving regulations largely designed to be waived for bribes (Krueger, 1974; Shleifer and Vishny, 1993; Mauro, 1995; Fisman and Svensson, 2007; Ayyagari et al., 2014).

Corruption, while retarding economic growth, can boost shareholder value. Where institutions supporting market transactions work poorly, influencing officials can be the only way to access essential resources. In such cases, corruption becomes *grease* payments firms must pay to build "connections" with officials that lubricate "bureaucratic gears" to "get things done" (Fisman, 2001; Wei, 2001; McMillan and Woodruff, 2002; Li et al., 2008; and Calomiris et al., 2010; Agarwal et al., 2015; Zeume, 2016). Connected firms earn *political rents* from being able to "get things done" that unconnected firms cannot. Pervasive corruption can thus emerge as a second-best suboptimal equilibrium, stabilized by connected firms protecting the values of their connections and officials protecting their streams of private benefits. This second best can be profoundly suboptimal (Murphy et al., 1991, 1993).

This second best suboptimal equilibrium can also be very stable. Anti-corruption reforms, albeit net efficiency improving, are resisted by parties with vested interests on the losing side of the ledger. Corrupt officials have much to lose; as do firms with extensive past investment in official "connections". Reducing corruption, by depreciating the value of such connections, could

"seize up bureaucratic gears" and reduce investors' valuations of highly connection-dependent firms.

Recent events in China help identify expected losers and winners and the empirical findings below help illuminate the economics of anti-corruption reforms. In 2012, the Hu Jintao and Wen Jiabao administration's preset term ended, and the Xi Jinping administration formally assumed power on the last day of the 18th National Congress (November 8th to 14th, 2012). On December 4th 2012, twenty days after taking office, Xi Jinping's Politburo announced a new "Eight-point Policy", a Communist Party policy directive ordering cadres to forego conspicuous perks and other obtrusive behavior. Interpreted narrowly and literally, the Eight-Point Policy stops government officials and state-owned enterprise (SOE) top executives, both of which are Party cadres, from demanding or accepting extravagant perks. However, almost immediately after the announcement, the Communist Party official website broadcast a broader interpretation, lauding the policy as initiating a major anti-corruption campaign.

The new policy was unexpected. Its announcement only twenty days after the National Congress, rather than a year later, during the Third Plenum of the Central Committee, when new policies are normally unveiled, was unprecedented. The unexpected and sudden rollout of a potentially sweeping anticorruption policy presents an opportunity to use and event study to explore how shareholders expect reduced corruption to affect the future prospects of listed firms.

We are mindful that anti-corruption reforms can trigger chains of interactive developments. For example, reduced corruption promotes economic development by improving allocative efficiency (Krueger 1976) and economic development supports institutional development, which can then further anti-corruption reforms (Zhao et al., 2011). Event study tests are especially useful where investors anticipate such feedback effects because new information causes changes in share

prices that reflect the summations of all such effects on investors' expected values of firms. The resulting share price changes obviously depend on prior conditions. Exploring this dependence helps illuminate the underlying economics. Moreover, because new information causes share prices to move, their movements cannot endogenously contribute to prior conditions.

Consistent with investors viewing corruption as value-destroying at the economy-level, the shares of the 81 mainland firms traded in Hong Kong (H shares) rise significantly relative to all other Hong Kong listings, by 1.59% and 2.26% in 3 and 5 day windows, respectively, surrounding the Dec. 4th 2012 announcement date. Moreover, the market portfolio of all 2,260 firms listed on China's two mainland exchanges, the Shanghai and Shenzhen Stock Exchanges, has positive significant cumulative returns of 2.77% or 3.86% over the same windows. The mainland market gains represent economically significant additions of ¥533 billion or ¥742 billion, respectively, to the total valuations of Chinese listed businesses.

Disaggregating this finding using the much larger population of firms listed on the mainland exchanges provides new insights into how the literatures summarized above interact. The main patterns we find across provinces and firms in stocks' reactions to the prospect of reduced corruption, and their possible implications, are as follows:

First, the National Economic Research Institute's (NERI) *Marketization Index* tracks Chinese provinces' very different progress towards market liberalization (Fan *et al*., 2011).[1] The portfolio of firms located in high-*Marketization* (top tercile) provinces gains significantly, by 3.20% and 4.46% in three and five-day windows, respectively, around the announcement date; while the portfolio of firms in low-*Marketization* (bottom tercile) provinces posts insignificant gains in both

[1] We use the term *province* in referring to all province-level governments. These include 23 provinces, 4 province-level cities (Beijing, Chongqing, Shanghai and Tianjin) and 5 autonomous regions (Inner Mongolia, Guangxi, Ningxia, Tibet and Xinjiang).

windows (0.54% and 0.98%, respectively). These findings are consistent with investors expecting reduced corruption to be more value-creating for firms located in provinces where market machinery is more "up and running" and less value-creating for firms located in provinces where bureaucrats, not markets, allocate resources and "connections" remain essential for "getting anything done."

Second, portfolios of state-owned enterprises (SOEs) gain in both sorts of provinces in both event windows. Portfolios of SOEs gain more than portfolios of other firms (nonSOEs) but the gap disappears in more liberalized (higher-*Marketization*) provinces, where both gain substantially.

SOE shares rising more than nonSOEs shares is consistent with investors expecting to benefit from the Eight-point Policy cutting private benefits for SOE top managers, all Party cadres directly subject to the Eight Point Policy, but leaving nonSOE top managers' private benefits little affected. By "private benefits", we mean all uses of corporate resources to advance the top managers' personal or family wealth, positions, or influence.

Larger nonSOE gains in more liberalized provinces are consistent with investors expecting the reforms to interfere with powerful government officials' charging tolls in those provinces. By "tolls", we mean extravagant gifts demanded for waiving regulations designed primarily to obstruct nonSOEs' responses to market forces, and to be waive in return for bribes.

Lower nonSOE gains in less liberalized provinces accord with investors expecting the reforms to interfere with nonSOEs' ability to grease bureaucratic gears in those provinces. By "grease", we mean bribes paid to officials who retain powers to allocate resources where markets are not yet up and running. Indeed, nonSOEs in the least liberalized provinces lose 2.72% and the gap between SOEs and nonSOEs widens to 5.99% (both in the three-day window). If we use a

five-day window to measure the announcement effects, the difference between SOEs and nonSOEs further increases to 7.3% in the least liberalized provinces. In contrast, SOEs, innately politically connected and carrying out state assigned missions, therefore need make neither toll payments nor grease payments to officials.[2]

Third, we conduct regression analyses of firm level stock price cumulative returns to explore further. Listed firms disclose their entertainment and travel costs (*ETC*). Morck and Nakamura (1999) interpret the analogous item in Japanese annual reports as proxying for top corporate insiders' private benefits. *ETC* might also proxy for tolls firms must pay to officials for lifting obstructive regulatory roadblocks. Cai *et al*. (2011) view *ETC* as proxying for grease payments firms must pay to "get anything done" where officials allocate resources. Positing a firm's *ETC* to be a proxy for an unknown mix of all three permits inferences about the importance of private benefits, tolls and grease payments for different firms in different institutional environments. Non-SOEs' higher prior-year *ETC* is associated with larger share price declines in the least liberalized provinces, but with larger gains elsewhere. This is consistent with non-SOEs' *ETC* being more predominantly "grease" in less liberalized provinces and more predominantly toll payments in more liberalized provinces.

SOEs' shares rise with prior ETC, consistent with their ETC reflecting wasteful private benefits, less of which boosts valuations. This effect diminishes in more liberalized provinces where market forces are stronger. This might reflect reduced ETC effectively cutting SOE top managers' compensation, which investors might expect to reduce managerial effort or intensify adverse selection by inducing talented SOE top managers to move to nonSOEs. Or just simply that

[2] The careers of both government officials regulating SOEs and SOE top executives are directly subject to the Organization Department of the Communist Party. SOEs also have access to SOE bank loans (Cull and Xu, 2003, Allen et al., 2005) and government concessions (Xu, 2011), which nonSOEs generally lack.

high ETC SOE's managers are poor self-serving managers having difficulties in facing market competition.

Fourth, very importantly, firm-level regressions reveal significantly higher gains for nonSOEs that are more competitive (higher total factor productivity, *TFP*), in more dynamic sectors (higher growth opportunities, Q), or in finance-dependence sectors (Rajan and Zingales (1998), if the nonSOEs are also in more liberalized provinces. This is consistent with investors expecting reduced corruption to clear away tolls, and with this to disproportionately benefiting more competitive private sector firms where market machinery stands readier to allocate resources. These findings expand upon other work linking China's anti-corruption reforms to enhanced competition. Giannetti et al (2017) report the reform augmenting the performance of small entrepreneurial firms, previously less able to compete against large high-ETC firms; and Li et al (2017) report the reforms improving nonSOEs' credit access relative to that of SOEs.

Obviously, investors can be wrong, and subsequent events may reveal more about the Chinese leadership's resolve and objectives over the longer term. However, this does not invalidate the analysis. Investors' expectations, even if ultimately unfulfilled, are useful information for both economists and policy-makers about the expected implications of public policy alternatives. Overall, our results suggest that investors expect anti-corruption reforms to boost share valuations more where prior market liberalization reforms have better readied markets for allocating resources efficiently. That is, the impact of anticorruption reforms appears to depend on the extent of prior market liberalization.

Our findings survive a battery of robustness checks. Additional tests exploring alternative explanations of these findings all weigh towards the interpretation above. However, market reforms might correlate with other reforms (e.g. enforcement effectiveness) or province

characteristics (e.g. high quality government, culture, history, education, or foreign influence) that could also complement anti-corruption reforms. We can reject some such alternatives (e.g. enforcement effectiveness), but others always remain. We therefore acknowledge that our conclusions, more broadly interpreted, might suggest that investors expect reduced corruption to add more to firm values – likely by limiting connections-driven state intervention and improving resource allocation more – where market reforms, market-related reforms or other characteristics conducive to market reforms are more prominent. We welcome further research exploring these distinctions.

2. Background and Event Description

2.1 Corruption in China

Dense networks of interpersonal obligations or *guanxi* (关系, lit. "connections") are a historically and culturally deep-rooted part of business in China (Gold and Guthrie, 2002). The term does not connote venality; developing connections is a normal and respectable part of doing business, indeed of life – and not just in China. However, *guanxi* can morph into specialized relations for trading favors, socially corrosive corruption, which is an increasing concern in China in recent years (Wedeman, 2012).

Official corruption is of special importance in China because its Socialism with Chinese Characteristics system relies critically on virtuous government officials. The constitution of the People's Republic of China enshrines the Leading Role of the Communist Party of China. This gives Party policies constitutional precedence over all laws and regulations and empowers Party officials to direct judicial verdicts and regulatory decisions (Chen, 2003; Jones, 2003). The vast

discretionary powers officials wield can easily make establishing ties of *guanxi* with them a very high return investment to any nonSOE (McGregor, 2010).

In this environment, the innocuous building of interpersonal connections becomes an avenue for political rent-seeking, which Krueger (1974) models as firms investing in influencing government officials with the expectation of profiting from regulatory favors, tax breaks, subsidies, and the like. When political rent-seeking becomes more profitable than investing in boosting productivity, economy-level growth lags even as corporate profits soar (Murphy et al., 1991, 1993; Shleifer and Vishny, 1993; Mauro, 1995; Svensson, 2005; Prichett and Summers, 2013). Equilibria in which political rent-seeking crowds out investment in productivity plausibly explain the middle-income traps in which many partially developed economies stagnate for decades (Morck et al., 2005). The avoidance of this trap is an increasingly salient policy concern in China (Woo, 2012) and indeed in many other economies.

Official corruption in China can include all three forms, grease, toll, and private benefits, as discussed above. (1) NonSOE firms pay bribes (grease) to seek official permissions and regulatory forbearances. (2) Officials can also devise economically pointless regulations or bureaucratic delays, which they can waive in order to create or repay obligations (tolls collection). (3) Government officials running SOEs can use their firms' resources to oblige other officials to provide them with "private benefits" – career advancements, advantages for their relatives, or favors to bestow on members of their patronage networks.

Chinese political rent-seeking is seldom overt, but rather occurs between people who have established a relationship, or *guanxi*. This develops after lavish entertainment and other extravagant gestures between the parties to the implicit contract. All these practices threaten the legitimacy of the Communist Party of China (CPC) because the lifestyles and advantages such

officials consequently enjoy jar with socialist egalitarianism and because the resultant resource misallocation threatens the rapid economic growth that sustains the Party's legitimacy.

Widespread corruption can form a stable suboptimal political-economy equilibrium.[3] Corrupt officials owed favors rationally oppose reforms that would prevent them from collecting what they deem their due. Corrupt officials owing favors rationally oppose reforms that would force them to find other ways of repaying their debts or risk the consequences of failing to do so. Both fear that anti-corruption reforms expose them to whistle blowing and punishment. This builds in inertia: powerful officials find anti-corruption reforms threatening to their personal interests, even if they recognize the public good in such reforms. A political shock to destabilize this equilibrium then becomes a necessary precursor to effective reform.

2.2 Political Background Developments in 2012

The Hu Jintao – Wen Jaibao administration's fixed term ended in 2012, and the new administration of Xi Jinping assumed office amid an ongoing struggle between multiple Party factions for political power and economic gain. This struggle appeared increasingly fierce throughout that year. One faction was allegedly led by Zhou Yongkong, then in the Standing Committee, the highest and most powerful CPC committee, though he might also have had backing from other established and powerful political grandees. Bo Xilai, like Xi Jinping, a politically ambitious princeling (son of a Mao-era revolutionary leader), despite being backed by Zhou Yongkong, was dismissed as Chongqing's Party Secretary on March 15th, suspended from the CPC's Central Committee and its Politburo a month later, and expelled from the Party on Sept. 28th 2012. The Washington Post

[3] Transparency International ranked China as a "highly corrupt country" in 2012.

wrote that Xi Jinping "disappeared mysteriously for two weeks. He went unseen, unheard, and undiscussed by official Chinese media," purportedly after being "hit in the back with a chair hurled during a contentious meeting of the 'red second generation'."[4] Regardless of the veracity of this particular report (the Post's writer expressed doubts), the period leading up to the succession was one of escalating tension.

The Party's 18th National Congress, on Nov. 8th to 14th 2012, marked the official transfer of power. On Nov. 14th, Xi assumed the title General Secretary of the Communist Party and Chairman of the Party Central Military Commission.[5] However, signs of an ongoing power struggle continued. At the beginning of the National Congress, "former President Jiang Zemin and other party veterans returned to centre stage … demonstrating their continued power to shape the country's future" (South China Morning Post, Nov. 8th 2012). By its end, Nov. 14th, Hu Jintao, the departing President of China and General Secretary of the Party, called for deepening reforms that maintain Socialism with Chinese characteristics, but unexpectedly relinquished all his titles and positions (Telegraph, Nov. 14th 2012). This unprecedented act was thought to be setting an example for other departed and departing leaders. On Nov. 17th, 2012, Hu and Xi jointly urged "the Chinese army to be absolutely loyal and to accomplish historic missions" (Xinhua News, Nov. 17th 2012). On Nov. 19th, in a meeting with the Politburo, Xi made a speech themed "firmly uphold and develop Socialism with Chinese Characteristics" and urged the Politburo to "promote and implement the spirit of the 18th CPC National Congress," (Xinhua News, Nov. 20th 2012). Political tension was still clearly on display, and no clear policy direction was yet evident.

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[4] See "The secret story behind Xi Jinping's disappearance" by Max Fisher, Washington Post Nov. 1st 2012. https://www.washingtonpost.com/news/worldviews/wp/2012/11/01/the-secret-story-behind-xi-jinpings-disappearance-finally-revealed/

[5] Xi assumed the title of President later, in March of 2013.

The first hint of these developing policies may have been a report submitted to the 18th National Congress by the *Central Commission for Discipline Inspection* (CCDI), the Party's top anti-graft body, arguing that the Party must fight corruption and treat this as a major political task, initially reported by Xinhua News on Nov. 20th 2012. However, in China (and elsewhere), attacks on corruption after an important political transition are often mere rhetoric, or even smokescreens for purging political opponents.

2.3 The Eight-point Policy

The CCDI was right: corruption had become a genuinely serious public concern. Figure 1 summarizes a 2013 PEW Research Center National Survey of Chinese respondents' top concerns reported in Financial Times (Nov 8 2013). Corrupt officials come in second, behind only inflation, and are ahead of inequality, pollution, food safety, and old age security. All mainland Chinese schoolchildren learn how corruption weakened Chiang Kai-shek's Kuomintang regime and created popular support for Mao's Communist Party. China's increasingly well-educated and cosmopolitan population appears to have accepted the Communist Party's political monopoly in return for delivering rapid economic growth. If corruption threatens to slow that growth, the Party risks being perceived as failing to uphold its half of the bargain and losing support, as Chiang did. Thus, a CCDI official warned that "*the public's trust in the Party and the government has fallen to a critical level*" (Xinhua News, Nov. 20th 2012).

Xi made cutting corruption his signature policy. Wang Qishan, who performed manual labor with Xi in Shaanxi during the Cultural Revolution, played a central role in the campaign. Wang an experienced senior party leader with a stellar vitae – Governor of China Construction

Bank (1994-7), Vice-Governor of Guangdong (1997-2002), Party Secretary of Hainan (2002-3), Mayor of Beijing (2003-7), appointed to the 17th Politburo in 2007, Vice-Premier of the State Council in charge of finance and economics in 2008, and a member of the CPC Standing Committee – became CCDI Secretary.

Xi began his anti-corruption campaign on Dec. 4th 2012 with a policy document by the *Politburo of the Central Committee of the CPC* entitled the Eight-point Policy (八项规定). Each of its points is an explicit instruction about how leading cadres are to behave going forward. The eight points are:[6]

1. Leaders must keep in close contact with the grassroots, but without inspection tours or formality.
2. Meetings and major events are to be strictly regulated and efficiently arranged; empty grand gestures are to be avoided.
3. The issuance of official documents must be reduced.
4. Overseas official visits and related formalities are to be restricted.
5. Leaders traveling by car must avoid disrupting traffic.
6. Media stories about official events are to be limited to events with real news value.
7. Government leaders should not publish self-authored works or congratulatory letters.
8. Leaders must practice thrift and strictly obey regulations regarding accommodation and cars.

Given the prior factional infighting, skeptics saw the Eight-point Policy as cover for a purge (Broadhurst and Wang, 2014) or simply an attempt to make cadres' behavior less invidious; but

[6] For details, see http://cpcchina.chinadaily.com.cn/2012-12/05/content_15991171.htm.

others saw a genuine anti-corruption campaign unfolding (Yuen, 2014).

The Eight-point Policy announcement was surprising in several ways. First, the announcement came only 19 days into the administration of President Xi Jinping. This timing was unusual because it preceded the Third Plenum, the traditional forum for announcing a new Politburo's policy directions, by roughly a year. Second, the statement was unusually concretely detailed and free of slogans. While it does contain some expected refrains, the document mainly specifies detailed rules. Third, almost immediately after the initial announcement, official elaborations made the anti-corruption objective crystal clear and explained that the Eight-point Policy was the first official policy of this sustained agenda. Professor Wang Yukai, a prominent member of the State Council directed Chinese Academy of Governance, spelled out the intent of the Policy on Dec. 7th 2012, explaining "The Politburo took the lead to change work style, it will play a critical role in fighting corruption at the root."[7] Premier Li Keqiang promised "zero tolerance to corrupt officials" and "to seriously punish any breach of the Eight-Point anti-bureaucracy and extravagance-busting guidelines as announced by the central authorities." Individual provinces quickly rolled out more detailed rules. For example, Tibet Autonomous Region released its own Ten Rules on December 5th 2012, itemizing how officials should reduce waste and extravagance and simplify official functions.

To verify that the Eight-point Policy was the only major national news story on or around Dec. 4th 2012, we use the news function in the WIND Information Database to search through a comprehensive collection of news from different sources, including the major financial media in China, the CSRC, People's Bank of China, Ministry of Finance, and other government

[7] See "Wang Yukai: Central Government Leads Drive to Root Out Corruption" *Communist Party of China News Web*, Dec. 7th 2012 (http://theory.people.com.cn/n/2012/1207/c40531-19818605.html).

organizations, and covering different areas, such as finance, business, government policy, law and regulations. We augment this by searching major news media and internet records. These exercises reveal no other major policy announcements, and confirm that the Eight Point Policy was the only major news event in the window period.

The policy gained immediate and widespread attention. Figure 2A graphs internet searches using Baidu, the Chinese analog of Google, using the terms "Eight-Point Policy" (八项规定) and "anti-corruption" (反腐), both normalized by the maximum of the former within the window. The figure shows both search volumes rising sharply on Tuesday, December 4th, the event date, with "Eight-point Policy" searches peaking two days later (Thursday December 6th) and "anti-corruption searches" peaking three days later (Friday December 7th).[8]

Figure 2B plots search volumes for terms relating to possible confounding news – 'Economic Development' (经济发展), 'Economic Growth' (经济增长), and 'Economic Reform' (经济改革) alongside "Eight-point Policy" searches, with all four normalized by the latter's maximum. The numbers of searches for all three alternative news terms remain low and magnifying them reveals no evidence of other news related economic policy changes in or near the event windows. We return to these issues in section 4, which presents additional robustness checks. The Eight Point Policy was the major standout event in this period.

The Party's subsequent actions also suggest that the policy had teeth. Xi Jinping remarked at a plenary meeting of CCDI in Jan 2013 (Xinhua, Jan 22 2013) that the administration should crack down on 'tigers' and 'flies' in rooting out corrupt politicians, eliminating illegal activities,

[8] Searches for 'anti-corruption' increase slightly prior to the event day on Nov. 20th 2012. This corresponds to Xinhua (official news agency) report on a CCDI submission to the 18th National Congress about the need to eliminate corruption, mentioning that one of Xi's close allies now headed the CCDI.

and curbing gift giving and conspicuous consumption to change the general behavior of officials and renew the Party. The CCDI subsequently launched a website on which whistleblowers could report cadres' violations of the policy. In 2013 alone, the CCDI reported disciplining 182,000 officials for corruption or abuse of power and 30,420 cadres specifically for violating the Eight-point Policy. Of the latter, 227 were province-level or higher. Other statistics reinforce the veracity of the Party's commitment. Sales of cigarettes, alcohol, shark fins, edible swallows, Gucci bags and Ferraris all dropped abruptly in 2013 (Ke et al., 2016). By 2014, a series of heavyweight cadres stood convicted of corruption. These included former Politburo member Zhou Yongkang, former Central Military Commission Vice-Chairman General Xu Caihou, People's Liberation Army General and Logistics Department Deputy Leader Gu Junshan, and even retired President Hu Jintao's Personal Secretary, Ling Jihua.

In these years, the information environment in China's stock markets had improved substantially relative to the 1990s. Using 1995 to 2012 data, Carpenter et al. (2014) report that "since the reforms of the last decade, China's stock market has become as informative about future corporate profits as in the US." Our observation window also precedes China's high market-volatility episodes of 2015 and 2016. This period of relative market calm is thus favorable to searching for information-driven share price movements in China's markets.

The above discussion validates the feasibility of an event study of the Dec. 4th 2012 announcement. The event date corresponds to no other confounding major news release of potentially economically important news. Stock returns around the event therefore plausibly reflect investors' initial expectations as to whether the policy announcement signaled the new administration firmly in charge and launching a substantive reform (with differential impact across the economy.

3. Methodology and Data

3.1 Event Study Methodology

Pervasive corruption is thought to reflect a country's institutions, broadly interpreted to include the mindsets and cultural norms of government officials, business leaders, and people in general. Institutions that constrain corruption are not clearly separable from institutions that more generally underpin a well-functioning market economy. Rather, they overlap and interact: constraints on corruption promote economic development, which encompasses the development of institutions, including those that more effectively constrain corruption which enhance anti-corruption efforts; which, in term, shift firms' objectives away from rent-seeking (Kruger 1974, Murphy et al 1991, 1993). These intertwined interactive effects likely play out over many years, so detecting them in firm or national accounting data in a manner free of endogeneity is problematic.

We therefore turn to event studies for obvious reasons. Stock prices react in hours or days to new information. In this case, the new information was the Dec. 4th 2012 announcement that corruption was to be constrained, which led investors to form new expectations about future developments. Stock price changes reveal how investors' expectations about listed firms' future prospects changed in consequence at the time. This approach has two advantages. First, because share prices are investors' expected present discounted values of all future payouts, share price changes reflect changes in investors' expectations about both direct and indirect effects on each firm's immediate and long-term prospects as the various interactions above unfold. Second, because share price changes are caused by new information, following a political shock, they cannot endogenously affect prior firm or economy conditions, such as prior levels of corruption.

Our event study tests and regressions are therefore defensibly free of endogeneity.

The main caveat to all event studies also applies. Stock price changes reveal only investors' expectations of how these changes affect firms' values. How firms actually fare in the long run requires decrypting patterns in long time-series and panel data. Because much research shows that investors can be wrong, the stock price changes we study must be interpreted as reflecting only investors' expectations at the time, not how the future actually unfolds. We argue below that the reform we study was initially widely thought to herald a major crackdown on corruption. Even if it later became something else, such as a tool for purging old guard, stock price changes when news of the reform first became public can reflect only changes in investors' expectations at that time. This caveat thus becomes an advantage in interpreting our tests.

Traditional event studies look for common patterns in the reactions of many stocks, each to its own news event on its own event date. Cross-sectional analysis uses abnormal returns, removing the influence of news with market-wide implications, because the focus is on identifying common patterns in the reactions of the individual stocks on firm-specific event dates – CEO sudden deaths, merger bids, equity issue announcements, or other such news.

The current exercise is somewhat different. The Eight-point Policy was designed to affect the entire economy, not specific firms, and to affect all firms at once. This motivates our first examining the market portfolio's raw return on and around the event date, instead of subtracting it to form abnormal returns.

Second, we nonetheless expect different sorts of firms in different parts of the country to be differently affected by the Eight-point Policy. We investigate this by comparing the returns of

portfolios of firms located in different provinces or with different ownership types.[9] These exercises use tests that Schwert (1981) recommends for event studies of regulatory changes.

Finally, we explore heterogeneity in the reactions of different sorts of firms to the announcement by running regressions explaining firm-level cumulative returns relative to industry means. These regressions assume meaningful independence in the idiosyncratic components of individual firms' reactions to the Eight-point Policy. We cluster standard errors bidirectionally: both by industry and by province.

3.2 Sample and Description of Key Variables

3.2.1 Sample

We begin with the population of all 2,336 firms listed on China's two mainland stock exchanges – the Shanghai Stock Exchange and the Shenzhen Stock Exchange. Stock returns and financial data are from the CSMAR database. We manually check whether there are corporate events in the five-day event window surrounding the Dec. 4th 2012 event date. We drop all firms with material corporate events, such as stock or cash dividends, stock splits or reverse-splits, new share or debt issuances, and announcements regarding mergers, restructurings, related-party transactions, or CEO turnover. This leaves 2,260 useable firms. Due to missing data, our final sample for regressions has 2,024 firms.

In looking at how different stocks might react differently to the Eight Point Policy announcement, we consider firm types – SOEs versus nonSOEs, their likely past spending on

[9] This assumes that firms business environments is primarily shaped by their home provinces' reforms. However, robustness checks below show that our results are unaffected by excluding firms likely to operate nationally.

official connections, and the institutional environment in which they reside.

3.2.2 Firm Type: SOEs and nonSOEs

China has two broadly defined classes of listed firms, state-owned enterprises (SOEs) and non-state-owned firms (nonSOEs). SOEs enjoy favorable official treatment, e.g., preferential access to bank loans, the dominant form of financing in China (Cull and Xu, 2003; Allen et al., 2005). Some SOEs have state-enforced monopoles in key sectors including natural resources, civil aviation, communications, and finance (Chen et al., 2011) or other government concessions (Xu, 2011). Because SOE top managers have formal and typically high ranks as both Party cadres and civil servants, the Party, via its human resource arm, the Organization Department, determines their careers. Their career paths typically move them from one SOE to another and in and out of government every three or four years, with moves to better positions depending on faithfully implementing Party directives and on the performance of the SOE or other state organ they currently manage (Wu et al., 2014; Deng et al., 2015). This has three implications. First, because of their cadre and civil servant status, SOE top managers are directly subject to the Eight-point Policy. Second, SOEs depend less than do nonSOEs on "connections" to "get things done" and are less vulnerable to "toll" extraction because SOE top executives and the officials who regulate SOEs are all ultimately under the common control of the Party. Third, SOEs might well still spend money on connections, but these are more apt to be designed to advance their top managers' careers than to benefit their shareholders, and that also fall under the heading of private benefits.

NonSOE top executives, in contrast to those of SOEs, often have substantial equity ownership stakes in their firms, and careers more tied to their firms' prospects (Conyon and Lerong, 2011). NonSOEs, not intrinsically connected to the civil service, cannot rely on the Party's

command and control mechanisms to align government officials' interests with theirs. Indeed, government officials may even erect artificial regulatory barriers in the paths of nonSOEs as tollbooths, with which to extract bribes. Moreover, non-SOEs have less access to state-owned bank loans, capital markets (e.g. IPOs) (Cull and Xu, 2003; Allen et al., 2005; Firth et al., 2008; Piotroski and Zhang, 2014), and official licenses to enter new lines of business than SOEs have. Park and Luo (2001) note, "It is not surprising to find that private firms were often left out of business opportunities due to a lack of materials even if their products were popular in the market." Thus, nonSOEs must contend with more (and more severe) bureaucratic obstacles, many of which may exist primarily for bribe extraction, than SOEs confront.

These differences suggest that genuinely reducing corruption would affect SOEs and nonSOEs differently. If anti-corruption reforms mitigated officials' discretionary powers, more competitive firms would obtain more financing and business opportunities and be subject to less bribery extraction; and this could help nonSOEs more than SOEs. In contrast, if such reforms led to bureaucratic paralysis and increased the cost of doing business, nonSOEs could be worse affected than SOEs. Furthermore, if anti-corruption reforms curtailed SOE managers' private benefits extraction, SOE performance might improve.

To classify firms as SOEs or nonSOEs, we begin with all firms with 2011 data in the China Listed Private Enterprise Research Database (CLPERD), which contains firms that China Stock Market and Accounting Research (CSMAR) classifies as "private enterprises". This list includes all firms so classified in any year between 2003 (the beginning year of the database) and 2011. We crosscheck this list against 2011 data on controlling shareholders from the China Listed Firm's Shareholders Research Database (GTA_HLD), which identifies major equity blockholders and their control and cash flow rights following La Porta et al. (1999). We double check these data by

manually collecting 2011 ownership structure data for all listed firms from the Sina Finance database (http://finance.sina.com.cn), paying special attention to cases where the two prior approaches disagree. This gives us a tentative roster of nonSOEs in 2011 and information about all listed firm's major direct shareholders that year.

To identify ultimate controlling shareholders, we construct control chains as follows. First, we identify other listed firms' stakes in each listed firm. This allows us to build control chains from each listed firm to an ultimate controlling entity that is unlisted. We say an ultimate controlling shareholder controls a firm if the minimum control block, what La Porta et al. (1999) call the weakest link, in the control chain connecting them is at least 30%. This threshold accords with CSRC (China Securities Regulatory Commission) guidelines, issued on Dec. 16 1997, for inferring control and also aligns with the definition in CSMAR data. We then use company web-site and use Baidu searches to classify these ultimate controlling shareholder as either state (governments or government or Party organs) or non-state (all others) entities. In many cases, this requires identifying ultimate controlling shareholders of unlisted holding companies or other investment vehicles. State entities include central, provincial, city, or municipal level governments, state-controlled institutions, and state-controlled investment vehicles, such as State-owned Assets Supervision and Administration Commissions (SASACs). We say a firm is an SOE if it is ultimately controlled by state entity, so defined, and as a nonSOE otherwise. These manual searches lead us to reclassify 87 firms as SOEs.

Our approach likely understates state control, as many nonSOEs are indirectly state-controlled through ostensibly nonSOE holding companies run by government officials. Moreover, all firms of any note have Party Committees and Party Secretaries to assist their boards and CEOs. Nonetheless, the SOE designation plausibly reflects a more direct Party role in governance, a

closer alignment of top executives' interests with those of cadres in the civil service, and preferential treatment by government officials and the major banks, all of which are SOEs.

3.2.3 Development of Market Institutions

Because different provinces have implemented market reforms to very different extents, the private sector accounts for very different fractions of output, employment and investment across provinces; as does state intervention in setting wages and prices. Where market reforms are farther along, mitigating corruption plausibly improves resource allocation efficiency more. Nonetheless, throughout China, officials retain sweeping economic powers. Even where officials do not directly command resource allocation, they can impose licensing and permit requirements and can force firms to submit to inspections, obtain permits, and otherwise submit to official oversight. Such measures are part of any developed market economy, but Socialism with Chinese Characteristics entrusts China's officials with especially sweeping powers. Where market reforms are well along, officials can abuse these powers by imposing arbitrary barriers and then charging tolls for removing them so firms can get on with responding to market forces. Anti-corruption reforms that reduce such tolls would presumably increase firms' shareholder valuations, all else equal. Where market reforms have come more slowly, officials still allocate critical resources so official connections might be essential to "grease" bureaucratic gears, and reducing corruption might have ambiguous implications. Indeed, if cutting corruption leads utility-maximizing officials to pursue a "quiet life" of inaction (Wilson 1989), bureaucratic gears could seize up, raising the cost of doing business where market reforms are limited. We therefore note the province in which each firm is located and the extent of market reforms there.

Of course, a province's progress towards market reforms may well correlate with other indicators of development, such as human capital or infrastructure development, all of which might

ultimately reflect the quality of its government. A province's capacity to implement such reforms might also turn on historical factors such as its previous exposure to commerce, entrepreneurship, foreign ideas, etc. We consider these interpretations of our results below.

To measure the extent of market reforms, we use the province-level *Marketization* Index produced by the National Economic Research Institute (NERI) (Fan *et al.,* 2011). The *Marketization* Index is based on official statistics and enterprise and household surveys. The index rises as the private sector shares of output, investment and employment rise, price controls and trade barriers fall, factor markets (labor, finance and investment) are liberalized, and the legal environment improves. The index is scaled to range from zero to ten in the base year 2001, with higher scores indicating more progress towards a market economy, and can exceed ten or fall below zero in subsequent years to reflect a province's progress or retrogression over time. This index is widely regarded as meaningfully measuring the progress of pro-market reforms (Wang et al., 2008; Fan et al., 2011).

Table I reports the *Marketization* Index in 2011 for each province. The five most economically liberalized provinces are Zhejiang, Jiangsu, Shanghai, Guangdong, and Beijing; the least liberalized are Tibet, Qinghai, Gansu, Xinjiang and Guizhou.

3.2.4 Investment in Connections

Prior work suggests that reducing corruption diminishes the value of a firm's political connections (Fisman, 2001). Different firms may have invested different amounts in connections. A binding anti-corruption reform that reduces the importance of such connections might adversely affect firms with substantial such investments, even as it lifts the burden of corruption from the economy as a whole. Cai *et al.* (2011) show that firm-level "entertainment & travel costs" (*ETC*) can proxy for firms' investment in connections. Analogously, firms' *ETC* might proxy for government

officials' bribery extraction. However, *ETC* also includes executives' spending on their own entertainment and travel; and Morck and Nakamura (1999) interpret the analogous item in Japanese firms' annual reports as measuring insiders' private benefits. Thus, *ETC* might also proxy for self-serving management's spending on private benefits.

We therefore allow that a firm's *ETC* could reflect a mix of all three: investment in connections essential to "getting anything done", the cost of passing through proliferating bureaucratic toll barriers designed to extract artificial bribes, and spending on private benefits for its top insiders. The traction of the Eight-Point Policy in different firms plausibly depends on this mix, which plays out differently for SOEs and nonSOEs.

NonSOE top executives diverting their firms' money to fund their private benefits are not violating the Eight-point Policy. However, government officials accepting lavish perks from nonSOEs are violating it. If the reform interferes with nonSOEs bribing officials to "grease bureaucratic wheels", nonSOEs may find doing business abruptly more difficult. This presumes that, in the absence of bribes, officials prefer inaction to action (Wilson 1989). However, if the anti-corruption reform stops officials from deploying arbitrary bureaucratic barriers as bribe extracting tollbooths, nonSOEs might benefit. We posit that these two offsetting considerations are likely to be more prominent in the *ETC* of nonSOE than of SOEs, which are intrinsically connected to the state.

SOE top executives, all top Party cadres, are violating the Eight-point Policy if they spend their firms' money lavishly entertaining, themselves, their families, each other, or anyone else. SOEs are charged with contributing to GDP growth and carrying out Party policies. Government officials who try to extract tolls from SOEs risk accusations of obstructing Party policy, something career-minded cadres aspiring for promotion within the Party hierarchy would want to avoid. If

SOE *ETC* is aimed at building connections, their purpose is more likely to be advancing the career prospects of the SOEs' top executives than the prospects of the SOE. From public shareholders' perspective, such *ETC* – which might include wining and dining superiors or potential superiors – is merely another insider perk akin to SOE executives spending on lavish living or other private benefits. We thus posit that the insider private benefits component of *ETC* is likely higher in SOEs than in nonSOEs.

We construct our *ETC* variable using data manually collected from Chinese listed firms' annual reports. Under Chinese accounting principles, entertainment costs (EC) and travel costs (TC) are secondary accounting items reported for each fiscal year in notes to the Income Statement lines for Management Expenses or Sales Costs (or both). An annual report can include up to four such notes. Chinese accounting principles allow substantial leeway about where any given *ETC* cost goes. Moreover, different firms sometimes use different Chinese names for these costs (e.g. accommodation costs, business trip costs) and disclose them in different formats. Finally, some firms report neither EC nor TC.

Inspection of annual reports shows firms reporting *EC* or *TC* or both and doing so under Management Expenses, Sales Costs or both. In some cases, one firm reports under different headings in different years, with none at all reported in some years. To allow for variation in reporting practices, we construct our primary *ETC* measure as follows: We first take ETC as the sum of all (i.e. under either Management Expenses or Sales Costs) *EC* and *TC* in 2011. In 28 cases, the firm reports neither *EC* nor *TC* in 2011, but reports one or both in 2010, and we take its *ETC* to be the sum of all *EC* and *TC* in 2010. *ETC* for remaining firms is treated as missing.

This approach is necessarily *ad hoc*, so we construct alternative measures of *ETC* in a range of ways. One alternative does not fill in the 28 cases with missing 2011 data using 2010 data, but

also treats these as missing. Another presumes that firms reporting neither *EC* nor *TC* in 2011 actually do have zero *ETC* in 2011. Still another sets ETC to zero if a firm reporting neither EC nor TC in 2011 and the three prior years, but treats ETC as missing if the firm reports either in any of those prior years. The results in the tables are preserved using these alternative *ETC* measures, and are occasionally significant in places where our primary *ETC* measure is not.

4. Empirical Findings

4.1. The Reaction of the Market

We first examine stock price reaction to the anticorruption policy using the 81 mainland stocks listing in Hong Kong. We then turn to the larger sample of stocks trading in the two mainland stock exchanges – Shenzhen and Shanghai.

Figure 3 shows the cumulative return of the portfolio of the 81 mainland stocks rising abruptly relative to the portfolio of all other Hong Kong stocks around the event date. These gains are not quickly reversed, and are therefore unlikely to be driven by trading pressure. The 3-day cumulative return of the portfolio of Hong Kong listed mainland shares is a significantly positive 1.89% ($p < 1\%$); the 5-day cumulative return of the portfolio is also significantly positive: 2.83% ($p < 5\%$). This contrasts with the insignificant +0.40% and +0.57 three and five-day cumulative returns, respectively, for the portfolio of all other Hong Kong stocks. The difference-in-differences of 1.59% and 2.26% for the 3 and 5-day windows respectively, are highly significant, with p-levels of less than 0.001 in both.

Because foreign investors have unrestricted access to the Hong Kong market, listed mainland companies' share prices can be interpreted as gauging Hong Kong and international

investors' expectations about the reforms. These results are consistent with these investors viewed the Eight-point Policy announced on Dec. 4th 2012 as particularly positive economic news for mainland firms. The sample of 81 Hong Kong listed Chinese firms is very small, only 3.6% the size of the full sample of mainland stocks, and too small to allow meaningful cross-sectional comparisons.[10]

Table II summarizes the share price reactions of Chinese firms listed on the mainland exchanges in two windows: a three-day window [-1, +1] from the trading day before the Dec. 4th 2012 announcement date to the trading day after and a five-day window [-2, +2] beginning two trading days before the announcement date and ending two trading days after. The market portfolio gains 2.77% in the three-day window and 3.86% in the five-day window, with both figures statistically significant.[11] Both are also economically significant, representing ¥533 and ¥742 billion increases, respectively, in investors' valuations of corporate assets. These findings accord with investors viewing the Eight-point Policy as important and, on net, good news.

Nor are these returns reversed. Rather, the event date emerges as an inflection point for the market return – the end of a sustained down market and the onset of a sustained up market. This is evident in Figure 4, which presents a value-weighted cumulative total (adjusted to include dividends and account for splits) market return. An equal-weighted cumulative total market return similarly shows that the event date portfolio value changes persist.

If reducing corruption improves resource allocation by unfettering market forces (Shleifer

[10] They also may not be representative of mainland-listed stocks (Hung et al., 2012). Furthermore, most of these shares are not cross-listed on mainland exchanges, and Hong Kong accounting rules do not mandate disclosure of entertainment and travel costs.

[11] In this, and the other portfolio significance tests to follow, the portfolio's mean event window return and historical standard deviation, the latter estimated using data from 210 to 11 trading days before the event date (-211 to -11), are used to assess statistical significance.

and Vishny, 1993; Mauro, 1995; Giannetti et al 2017; Li et al. 2017), firms in more liberalized provinces would gain more. The second and third rows of Table II show the returns of portfolios of firms in provinces at different stages of liberalization. The three-day window cumulative return on the portfolio of firms in the highest-tercile *Marketization* provinces is 3.20% and statistically significant. In the 5-day window, the same portfolio rises by a statistically significant 4.46%. In contrast, the cumulative three-day window return on the portfolio of firms in the lowest-tercile *Marketization* provinces is a statistically insignificant +0.54%. In the five-day window, this portfolio registers an insignificant +0.98% rise. The differences between the portfolios of firms in the highest vs lowest-tercile *Marketization* provinces in the 3-days and 5-days windows are 2.66% and 3.49%, respectively, and are both highly statistically significant.

The divergence in valuations of the portfolio of firms in high versus low Marketization provinces is not ephemeral. The cumulative return from a hedge position, long high-*Marketization* province stocks and short low-*Marketization* province stocks, is substantial and not quickly reversed, as it might were temporary price pressure magnifying the divergence. Depending on when the position is closed, the gain ranges from just below zero to just above three percent. Closing the positions on an average day in the two trading weeks (ten event days) after the end of the five-day event window nets a statistically and economically significant 1.76% ($p = 0.06$). Closing the positions on an average day between the end of the five-day event window and thirty trading days after the event date again nets 1.50% ($p = 0.04$).

4.2 Market Development, SOEs and nonSOEs

Section 3.2.2 argues that the anti-corruption reform might affect SOEs and nonSOEs differently. Panels A and B of Table II therefore compares the cumulative returns over three- and five-day

event windows, respectively, centered on Dec. 4th, 2012, of portfolios of SOEs versus nonSOEs, as well as of sub-portfolios of SOEs and nonSOEs in the highest versus the lowest-tercile *Marketization* provinces. Several patterns emerge.

First, the portfolio of all SOEs and the sub-portfolios of SOEs in provinces with high and low *Marketization* indexes all have positive and statistically significant returns. The sub-portfolios of nonSOEs in bottom-tercile marketization provinces have cumulative losses, with the loss in the 3-days window significant; while the subportfolios of non-SOEs in the highest-tercile *Marketization* provinces gain significantly.

Second, sub-portfolios of nonSOEs in top tercile *Marketization* provinces significantly out-perform sub-portfolios of nonSOEs in bottom-tercile *Marketization* provinces. A similar but insignificant and much smaller difference is evident in the point estimates for the analogous SOE subportfolios comparison.

Third, the sub-portfolio of SOEs outpaces that of nonSOEs by a wider margin in lowest- than in highest-tercile *Marketization* provinces. Specifically, within the 3-days window, in low-*Marketization* provinces the subportfolio of SOEs gains a statistically significantly 5.99% more than does the sub-portfolio of nonSOEs; in high-*Marketization* provinces the SOE and nonSOE sub-portfolios have statistically indistinguishable returns with point estimates putting the SOE portfolio gain only 0.25% above that of the nonSOE portfolio. In the 5-day window, the corresponding numbers are a statistically significant 7.38% and an insignificant 0.13%, respectively.

Table II suggests that shareholders expect most firms to be worth more because of the anti-corruption reforms. Shareholders' valuations of SOEs rise more relative to nonSOEs in lower-*Marketization* provinces, but SOE and nonSOE gains are more comparable in high-*Marketization*

provinces. Indeed, in less liberalized provinces, Table II shows valuation losses in nonSOE portfolios.

These patterns point to several possibilities. First, the reform may indeed have directly restrained SOEs top managers, all Party cadres, from orchestrating wasteful diversions of corporate resources to fund their private benefits, including doing favors in hopes of advancing their careers or enriching themselves, their relatives, or their friends. Second, the anti-corruption reform made "greasing bureaucratic gears" harder and this may have impeded nonSOEs, more than SOEs, from getting things done, especially where market institutions are weak. Third, where market institutions are better developed, nonSOEs might function better after the reforms clear away bureaucratic tollbooths. To investigate these possibilities, we turn to firm level regression analyses.

4.3 Firm-level Regressions

Table IV presents regressions explaining individual SOE and nonSOE stock price reactions to the anti-corruption reform with firm and industry characteristics and their interactions with the level of the *Marketization* index of the firm's province. These characteristics include firm-level *Total Factor Productivity* (*TFP*), estimated as in Levinsohn and Petrin (2003), *Growth Potential* (Q), defined as industry-average Tobin's q (market-to-book ratio), and *External Finance Dependence* (*EFD*), defined as industry-average capital expenditures minus cash flow from operations over capital expenditures (Rajan and Zingales, 1998)[12]. If investors expected the anti-corruption reform to raise allocative efficiency more in more liberalized provinces, larger gains should be evident in the stocks of more competitive firms, firms in industries with more growth opportunities, and firms

[12] Both *Growth Potential* and *External Finance Dependence* are defined as the industry simple average. We also do a robustness check using value-weighted industry average, and find the results are similar.

in industries needing more external financing in those provinces. Thus, the regressions include interactions of the *Marketization* index with each of these variables.

The regressions also include firm-level *ETC*, which we take to reflect some combination of a firm's past spending on connections useful for "getting things done", tolls extracted by obstructive officials, and private benefits for corporate insiders. How a firm's past *ETC* might relate to its stock price reaction to the anti-corruption reform depends on which of these three purposes weighs more heavily in its *ETC*. We posit that nonSOE *ETC* is more about building connections for "getting things done" in low Marketization provinces and more about paying tolls to obstructive officials in high Marketization provinces. *ETC* is plausibly partly spending on private benefits for insiders, but the reforms should reduce this sort of *ETC* primarily in SOEs, whose top insiders are also career Party cadres. High *ETC* SOEs thus might have more scope for waste reduction as the reforms take hold, which would bolster SOE share prices. However, as argued above, higher ETC by an SOE might also signify less talented or less motivated managers. The regressions also explore this by including cross-terms of *ETC* with *Marketization*. The regressions also include as explanatory variables *Marketization*, *ETC* and *TFP* main effects; those of *EFD* and *Growth Potential* are subsumed by industry fixed-effects.

The regressions also control for measures of the province-level business environments: provincial *GDP Growth*, log(*GDP per capita*), and *Education Spending* as a fraction of GDP. These controls capture a location's generic economic development. The regressions also control for *Firm Leverage* (total liabilities over total assets), which mechanically amplifies equity valuation changes associated with changes to asset valuations, as well as *Firm Size* (log of total assets) and *Research and Development Spending* (R&D/ sales) to allow for shares of small firms and firms with more intangible assets moving systematically differently. The industry fixed-effects

remove common reactions across industries. Clustering is bidirectional, by both industry and province. All explanatory variables are lagged one year – that is, use 2011 data. Table III reports their means and standard deviations in the full sample and in the sub-samples of SOEs and nonSOEs used for the regressions.

Given the very different patterns of results for portfolios of SOEs and nonSOEs revealed in Table II, we run separate regressions for the two categories of firms. Table IV reports the results, with the regressions in Panels A and B, respectively, explaining 3-day and 5-day firm-level cumulative returns. Industry fixed-effects essentially leave the Table IV regressions explaining cumulative abnormal returns, defined as returns minus industry mean returns.

4.4.1 Market Institutions, Firm Characteristics and Stock Price Reactions

In both panels of Table IV, the *Marketization* index attracts highly statistically significant positive coefficients in regressions (1). The analogous coefficients in (3) are negative and that in panel A is statistically significant (p = 10%). NonSOEs in more liberalized provinces thus gain more in reaction to the Eight-point policy; while SOEs' in more liberalized provinces gain less (or lose more). Like patterns emerge for *Education Spending*, another indicator of provincial development, although this variable is insignificant in the SOE regressions.

Focusing on *Marketization* and using regressions (1) and (3) in Panel A to illustrate, a one standard deviation increase in *Marketization* is associated with a 0.37% three-day gain for nonSOEs, but a 0.35% three-day decline for SOEs. Pooling the data and running a regression containing an SOE dummy and interactions reveals the differences to be statistically significant. Thus, investors expect reduced corruption to be more beneficial for nonSOEs' where market reforms are further along; that is, where more completely liberalized leaves market forces better able to guide resource allocation. In contrast, investors expect reduced corruption to be less helpful

(or more harmful) to SOEs where market reforms are more advanced, perhaps because they expect the reform to unfetter market forces for which previously cossetted SOEs are ill prepared.

Regressions (2) and (4) elaborate on these findings by including interactions of *Marketization* with the firm and industry characteristics described above: the industry-level variables *Growth Potential* (*Q*) and *External Finance Dependence* (*EFD*) and the firm-level variables *Total Factor Productivity* (*TFP*) and *Entertainment and Travel Costs* (*ETC*). The highly significant joint F-tests of the *Marketization* main effect and its interactions with these variables, shown near the bottom of each panel, justify exploring the economic significance of the individual interaction terms.

In regression (2) of Panel A, where the dependent variable is nonSOEs' 3-days window cumulative returns, the province-level *Marketization* main effect becomes insignificant ($p = 0.58$); however, its interactions with firm-level *TFP*, industry-level *Growth Potential*, and industry-level *External Finance Dependence* (*EFD*) are all positive and significant, both individually and jointly. The same pattern emerges in the 5-days window regression (2) in Panel B. These results are consistent with investors expecting nonSOEs in more liberalized provinces to gain more from reduced corruption, particularly if they are also more productive or in sectors with more growth opportunities or more need for external capital. If investors expect reduced corruption to unleash stronger market forces where the *Marketization* index is higher, these results are also consistent with investors expecting stiffer market forces to disproportionately benefit more competitive non-SOEs in more dynamic sectors.

Regressions (4), explaining SOE cumulative returns, show intermittent significance in the cross terms of *Marketization* with *Growth Potential* (positive and insignificant in Panel A, but significant in Panel B), *External Finance Dependence* (negative and insignificant in Panel A, but

significant in Panel B) and *Total Factor Productivity* (negative and significant in Panel A, but insignificant in Panel B). This instability in the interaction coefficients leaves us reluctant to draw economic inferences.

Table IV also links past *ETC* to event window returns after controlling for firm, industry and macro characteristics. Regression (1) in Panel A shows nonSOEs with higher past *ETC* spending gaining less. Regression (2) in Panel A elaborates, showing *ETC's* main effect term to be a negatively significant -0.136 and its interaction with *Marketization* to be a positively significant 0.029. These coefficients imply that, where *Marketization* is above 4.69 (all provinces except Qinghai and Tibet), a nonSOE's *ETC* correlates positively with its stock price gain. Using the corresponding regression results in Panel B yields the same conclusion. Thus, the regressions imply that *ETC* is negatively related to non-SOEs' cumulative returns only in the two least liberalized provinces. Elsewhere, the relation is positive, and larger in more liberalized provinces.

SOEs' *ETC* shows a starkly different pattern. In both panels, SOEs with higher *ETC* gain insignificantly in regression (3), though the coefficient is significant at 10% in a one-tail test in Panel B. In both panels, regression (4) show the *ETC* main effect to be positive and significant; while *ETC*'s interaction with *Marketization* is negative and significant. Repeating the arithmetic above for SOEs shows that *ETC* correlates positively with SOEs' stock price gains only in Tibet, the least economically liberalized province. Elsewhere the correlation is negative, and more negative in higher *Marketization* provinces.

Our interpretation of the *ETC* results follows from our assumption that the component of non-SOE *ETC* most directly affected by the anti-corruption reforms is their spending on private benefits for top Party cadres in government who can help or hinder them. In less liberalized provinces, such as Qinghai and Tibet, where government officials retain more sweeping power to

allocate real resources, nonSOEs' *ETC* spending builds "connections" essential to "getting things done." In these provinces, limiting officials' scope for accepting private benefits "seizes up bureaucratic gears" and paralyzes nonSOEs as well as reducing the value of their past investment in connection. In more liberalized provinces, where better functioning market institutions can allocate resources, corrupt officials can still obstruct nonSOEs unless they pay "tolls" by providing the officials with private benefits. In these provinces, limiting officials' scope for accepting private benefits clears the tolls away, letting nonSOEs respond to market forces.

NonSOE *ETC* doubtlessly also includes the costs of self-serving insiders' private benefits. If nonSOE managers who consume larger private benefits are also lower quality managers, investors might also expect reduced corruption that unleashes market forces to be more problematic for non-SOEs with higher ETC, and their stocks would thus gain less. Our regression results suggest that the positive impact of limiting nonSOEs' toll payments predominates in general: it exceeds the negative impact of nonSOEs being less able to "grease bureaucratic gears" plus that of nonSOEs with lower quality managers faltering under heightened competition. Specifically, the stocks of nonSOEs with higher past *ETC* decline only in the least liberalized provinces, but gain elsewhere, and gain more the higher their past *ETC*.

In contrast, SOEs have hardwired connections because their top managers and the officials regulating them are career Party cadres serving the same Party leadership. Because SOEs have less need to bribe officials, either to "get things done" or to remove artificial toll barriers, SOE *ETC* is more likely to be spending on private benefits for top SOE insiders. Investors may thus view the anti-corruption reform as primarily cutting more waste in SOEs with higher *ETC*, consistent with SOE stocks gaining broadly on news of such reforms, and gaining more if their prior ETC was higher.

The finding that SOEs with higher past *ETC* gain less in more liberalized provinces can be reconciled with our general interpretation of these results in several ways. If an SOE's high ETC signaled inept (if consummate at rent-seeking) top managers, investors would expect reduced corruption to render inept management costlier in more liberalized provinces with more stiffened competition. If an SOE's high ETC were high compensation (as private benefits) for highly talented top managers, investors might expect curtailed private benefits to trigger a brain drain of talented managers to nonSOEs, and would trim SOE valuations more where talent losses would be costlier –in more liberalized provinces where they also expect stiffer competition. Even absent a brain drain, cutting SOE top managers' private benefits might reduce their effort, which investors would again deem costlier in more liberalized provinces where they expect more stiffened competition.

Combining these explanations, the stock prices of SOEs with higher past *ETC* increase in less liberalized provinces, but drop in more liberalized provinces, and drop by more the greater their past *ETC*.

In summary, our regression results are consistent with the following investor expectations. First, investors expected the anti-corruption reform to unleash market forces to allocate resources and heighten market competition. Investors may also have expected the anti-corruption reform to presage still more market reforms in the longer run, perhaps especially in higher Marketization provinces, whose ability to implement reforms is more proven. Thus, more productive nonSOEs in industries with greater growth potential and more need for external financing gain more where market reforms are more advanced. In contrast, previously more cosseted SOEs with more self-serving managers or less ability to compensate talented manager well to gain less where market reforms are more advanced.

Second, investors expected the anti-corruption reform to deter officials from accepting bribes and handing out favors. This expectation plays out via two effects: (i) a reduction in investors' valuations of nonSOEs existing "connections", which can no longer "grease bureaucratic gears" where this is essential to "get things done" and (ii) an increase in investors' valuations of nonSOEs future cash flows as bribe-seeking officials are deterred from erecting tollbooths to expropriate nonSOEs' earnings. The former predominates in the least liberalized provinces while the latter predominates elsewhere.

Third, investors expect the Eight-Point Policy to curtail SOE top managers' wasteful diversions of corporate resources to finance their private benefits, interpreted broadly to encompass actions to advance their careers or enrich their families and friends. This boosts SOE shares.

4.4.2 Important Potential Alternative Interpretations

One of our key results is that the anti-corruption reform boosts nonSOE share prices more in more liberalized provinces. A province's *Marketization* is taken as gauging its progress in implementing market reforms, so our result is consistent with anti-corruption reforms unleashing latent market forces, which disproportionately helps more competitive nonSOEs, more in provinces whose market machinery is more fully up-and-running. Importantly, this interpretation links the positive of the anti-corruption reform to presence of market forces.

However, some alternative interpretations merit consideration. These turn on whether the Eight-Point Policy event signals reduced future corruption or something else, such as a broader commitment to further market reforms, and on whether the Marketization Index gauges the development of market institutions or something else, such as better quality government. The following discussion explores these alternative interpretations in detail.

Economic Reforms vs Anti-corruption Reforms

We interpret event window stock returns as reflecting investors' reactions to news that future corruption would be reduced, rather than news that economic reforms would continue. Although the Eight-Point Policy was unambiguously an anti-corruption measure, discussion about further economic reforms was ongoing. For example, the World Bank's "China 2030" study, urging continued reforms, circulated after Feb. 2012 and was formally published on March 23rd 2013. Moreover, economic reforms and reforms aimed at reducing corruption are not unrelated, so our interpretation must be justified.

Our primary justification is the internet search graphs in Figure 2. Consistent with the Eight-point Policy being news of an anti-corruption reform, rather than general economic reform, internet searches for anti-corruption spiked around news of the Eight-point Policy while searches for economic reform did not.

In addition, many of our results are more parsimoniously explained if investors viewed the Eight-point Policy as heralding reduced corruption, rather than renewed general economic reforms. If investors presumed that further general economic reforms would disproportionately benefit firms in provinces whose market reforms were already farther along, some of our results might follow. This is possible, but not *a priori* obvious because a central reinvigoration of the economic reform process might have the greatest impact where reforms had stalled. Provinces whose market reforms were already well along might have less left to do. Moreover, some of our findings are difficult to explain if investors did not expect the Eight-Point Policy to curtail corruption.

One such finding is that SOE shares rise with ETC in all provinces, whether they are in very low and very high Marketization provinces. If investors interpreted the Eight-point Policy as

signaling more reforms to come, this pattern suggests investors expected such reforms to include restraints on SOEs top executives' private benefits – that is to curtail a form of corruption.

Another is nonSOE shares drop with ETC in less liberalized provinces, but rise with ETC in more liberalized provinces. This is not obviously explicable if the Eight Point Policy merely signaled deeper economic reform to come, but is readily explained by reduced corruption impeding nonSOEs from making essential grease payments in lower Marketization provinces and impeding corrupt officials from charging obstructive tolls in higher Marketization provinces.

Market Machinery vs Enforcement

Provinces with more advanced market reforms might also be better run generally, and investors might expect better run provinces to better enforce the anti-corruption reform. Better-enforced reforms could boost share prices more in those provinces. Furthermore, better enforcement might also explain the larger gains by nonSOEs with higher past *ETC* in higher *Marketization* provinces. If nonSOE's *ETC* is more likely to be tollbooth payments to corrupt officials in more liberalized provinces, and investors expect better enforcement of the anticorruption reform to more thoroughly eradicate these tollbooths in better run provinces, this result would follow. However, although investors may indeed have expected more effective enforcement in higher Marketization Index provinces, several lines of reasoning weigh against the Marketization Index primarily proxying for effective enforcement and in favour of it also reflecting progress in market reforms.

First, if the reform were well enforced in high *Marketization* provinces and ill enforced in low *Marketization* provinces, Table II would show more positive returns for the high-*Marketization* portfolios and less positive or insignificant returns for low-*Marketization* portfolios. In fact, the low-*Marketization* nonSOE portfolio has large significantly negative returns in the 3-

day window. This would result if investors expected the reforms to be well enforced in those provinces, disabling old greases for bureaucratic wheels and rising the cost of doing business. Indeed, the Party discipline is plausibly stronger, not weaker, in less reformed provinces, so Party policies are likely to be more rigorously enforced in less liberalized provinces. For instance, China's least liberalized province-level jurisdiction, Tibet, was the first to show support of the Eight-point Policy by releasing its own Ten Rules on December 5th 2012, itemizing how Tibet officials should reduce waste and extravagance and simplify official functions.

Furthermore, the arithmetic calculations presented above in connection with the Table IV regressions show nonSOEs' share price reactions around news about the Eight-Point Policy negatively related to *ETC* for firms in Tibet and Qinghai, the two lowest *Marketization* provinces. The negative *ETC* combined effect in these provinces is inconsistent with enforcement being ineffective in low *Marketization* provinces., But this is readily explicable if the anti-corruption policy is well enforced, but markets work poorly in those jurisdictions, so investors assign lower valuations to their nonSOEs, abruptly unable to "get things done" via "connections" because of the reforms. Moreover, bigger gains for SOEs with higher prior ETC in low *Marketization* provinces accords with investors viewing that ETC as private benefits, which the anti-corruption would curtail.

Marketization and stronger developmental response

Provinces with stronger market machinery might also have better quality governments, which better promote market institutions, which improve resource allocation. These provinces might also have larger pools of well-educated potential top executives better able to boost firm productivity. Both SOEs and nonSOEs might react to a less corrupt business environment by replacing old top

managers, whose expertise is connection-building, with new ones whose expertise is increasing productivity. If investors expected this shift to be more complete in more liberalized provinces, our results might follow.

More generally, we must accept that different forms of institutional development overlap and interact. The *Marketization* index might reflect other province-level institutional characteristics such as a culture more supportive of entrepreneurship, a history of commercial activity, greater openness to foreign ideas, or any other latent factor that, when intervention by corrupt officials is blocked, promotes better resource allocation. Such characteristics might reinforce any positive impact investors expect reduced future corruption to have on firm's future prospects. We take the Marketization Index as its formulators present it, as a measure of each province's progress towards free markets; but accept that it might proxy for any number of the aforementioned other institutional characteristics. We welcome further research exploring alternative explanations of our findings.

4.5 Robustness Discussion

The first robustness issue is the newsworthiness of our event. Information leakage is a potential concern in event studies. Figure 2 shows internet searches for 'anti-corruption' (反腐) rising slightly somewhat before their much larger spike on and immediately after our event date. Checking news reports reveals a Nov. 20th 2012 Xinhua report describing a Central Commission for Discipline Inspection (CCDI) submission to the 18th National Congress on the need to eliminate corruption immediately. The date was just after the handover of power from the old to the new administration, and thus might be an alternative event date if investors viewed the CCDI submission as marking a genuine crackdown on corruption, rather than a repetition of prior

politburos' rhetoric condemning corruption.

To explore this, we examine stock returns around Nov. 20th 2012. In contrast to the significant positive reactions evident around the Dec. 4th event date, the market return in a three-day window around Nov. 20th is an insignificant 0.82%. The 5-day cumulative return is -0.54%, and is also insignificant. This exercise supports the validity of the Dec 4th news as a surprise, which fits our event framework to explore the economic implications of decreased expected corruption.

Another confounding event is on Dec. 7th 2012, the day on which Xi's visit to Shenzhen. The event is widely hailed as Xi signaling that the economic reforms launched by Deng Xiaoping in Dec 1992 would continue under his administration and also that Xi was immediately demonstrating the practice of the principles laid out in the Eight-point Policy[13]. While the news received much less mass media stories relative to the Eight-Point Policy announcement, we accommodate this event by repeating our work using a (-1, +4) window; that is, our event window stretches from Dec 3 to Dec 8th. The results are similar to those reported in Table 2. The regression results for non-SOEs are qualitatively similar to those reported in Table 4. For SOEs, the cross term results and the main effect of ETC become insignificant but the portfolio results remain. Given that SOE portfolios all gained substantially, the results suggest that investors expect gains beyond those captured by ETC spending.

Second, our findings survive a battery of standard robustness checks. Where a robustness check generates a pattern of signs and statistical significance identical to that in the tables, and point estimates roughly concordant to those in the tables, we say qualitatively similar results ensue. Where qualitatively similar results do not ensue, we explain the discrepancies in detail.

[13] See e.g. "Echoes of Deng Xiaoping as Xi Jinping heads to Shenzhen on first inspection trip," *South China Morning Post*, December 7th 2012. http://www.scmp.com/news/china/article/1099413/new-party-leader-xi-jinping-heads-shenzhen-first-inspection-trip

To ensure that our results are not driven by outliers, we winsorize firm-level cumulative returns at 1% prior to running the regressions in Table IV. The regression results are qualitatively unchanged if we do not winsorize the returns. A more conservative approach repeats the regressions excluding observations whose estimated residuals exceed ±2.5 times the standard deviations of the residuals. Qualitatively similar results ensue.

To ensure that our results are not driven by unusual provinces, we first exclude firms located in Tibet, whose cultural, social, political, and economic characteristics differ substantially from those of other provinces. This generates qualitatively similar results. We next exclude firms based in Beijing and Shanghai because these are China's most developed province-level jurisdictions and because firms with nationwide operations tend to be headquartered in them. This also generates qualitatively similar results. Finally, we drop firms based in Beijing, Shanghai, and Tibet to ensure that the results do not depend on the contrast between China's most and least developed provinces. This too generates qualitatively similar results.

Financial and real estate firms are regulated differently from other firms; and listed firms in these sectors have national operations. Dropping firms in finance, real estate, and in both sectors all yield qualitatively similar results.

The *ETC* variable is missing for 12% (264 of 2,260) of all firms for which all other data are available and with no confounding news during the event window. We substitute 2010 ETC for missing 2011 data to fill in 11% (28 of 264) of these to obtain our sample for the ETC regressions in Table IV. Thus, 88% of firms reporting no ETC in 2011 also reported none in 2010, raising the possibilities that these firms might either genuinely have insubstantial ETC in in some years or systematically manipulate their reporting to avoid disclosing ETC. Our results are robust to setting *ETC* to zero where it is missing in 2011, to setting *ETC* to zero where it is missing in

both 2010 and 2011, and to dropping observations with missing ETC in 2011.

Likewise, our results in Table II, where we tabulate comparisons of returns on the market portfolio, SOE and nonSOE portfolios as well as their sub-portfolios grouped by top and bottom terciles of provinces by *Marketization*, are obtained using the full sample including firms with missing *ETC* observations. The patterns in terms of magnitude and statistical significance are qualitatively identical if we drop observations with missing *ETC,* and regardless of whether or not we winsorize the returns at 1%.

We use total assets to measure firm size and scale *R&D* and *ETC* by total sales. Rerunning our tests using total assets to scale *R&D* and *ETC* yields qualitatively similar results.

The explained variable in the Table IV regressions is the event window cumulative total return of each stock. Because the regressions include industry fixed-effects, the operational explained variable is the firm's cumulative abnormal return, defined as the stock return minus the mean return of all stocks in its industry, a widely used event study methodology. Using simulations, Thompson (1988) shows that cumulative abnormal returns calculated in this way generate results imperceptibly different from cumulative abnormal returns generated from asset pricing models. Furthermore, a serious campaign against corruption may well change the risk environment, and therefore firms' risk factor loadings. Putting these issues aside, we repeat the Table IV regressions using three and five-day event window cumulative abnormal returns, calculated as cumulative returns minus cumulative estimated market model returns using the contemporaneous market return and market model parameters estimated using stock returns from trading day –210 to day –11, where day 0 is the event date of Dec. 4th 2012. The coefficients of primary interest – those of the *Marketization* index, *ETC*, and the interactions of the *Marketization* index with industry *Growth Potential* and *External Finance Dependence* and with firm-level *Total Factor Productivity*

and *ETC* – are qualitatively similar to the results in Table VI, save that the *Growth Potential* cross with *Marketization* variable loses significance in the SOE regression (4) in Panel B of Table VI.

The firm-level tests cluster separately by industry and province (two-way clustering). Redoing the tests clustering by industry only, by province only, or by industry-province cell all generate identical signs and point estimates to those in the tables, but higher t-ratios than those in the tables in many cases. We therefore present two-way clustering results as the most conservative.

5. Conclusions

China's per capita GDP, among the lowest in the world in 1978, when Deng Xiaoping began market reforms, has reached global middle-income levels. Those reforms created a hybrid system, accurately called Market Socialism with Chinese Characteristics, in which the Communist Party of China exercises a constitutionally entrenched Leading Role. In practice, this grants officials sweeping discretionary powers to reinterpret, waive, or enforce laws and regulations. The money at stake in swaying these officials' decisions has grown in step with the economy to the point where widespread corruption may well be locking into power a stable network of political rent-seeking-based cronyism that risks undermining the Party's legitimacy.

Such problems are not unique to China. Corruption is associated with slow growth (Shleifer and Vishny, 1993) and exacerbated inequality (Alesina and Angeletos, 2005), both symptomatic of the so-called Middle Income Trap, a stable low-level equilibrium characterized by pervasive political rent-seeking thought to have ensnared many economies (Rajan and Zingales, 2003a, b). Entrapped middle-income economies' resources flow into connection-building, which has negative economy-level spillovers, rather than increasing productivity, which has positive economy-level spillovers (Murphy et al., 1991, 1993). This equilibrium is stabilized by connected

firms' increasing returns to scale from learning-by-doing in political rent-seeking (Morck et al., 2001) and commensurately increasing vested interests in preserving their political rents (which let them "get things done" that unconnected firms cannot), officials' vested interests in firms' continued spending on connections, and the vested interests of both in concealing their past behavior.

Our findings show that news of the Eight-point Policy, an initially unexpectedly genuine anti-corruption reform, left investors expecting a destabilization of this situation. The key findings are:

1. Listed firms' market valuations rise broadly and significantly around this event.
2. SOE shares also rise broadly and significantly. These gains mostly stem from a positive correlation with past entertainment and travel costs, but less so for SOEs in more liberalized provinces.
3. NonSOEs' gains also relate to their past ETC. NonSOEs in more liberalized provinces gain more if their past ETC was higher; in less liberalized provinces, this effect diminishes and reverses. In the least liberalized provinces, non-SOEs' shares lose, and lose more if their past entertainment and traveling costs were higher.
4. The shares of non-SOE that are more productive or in more external finance-dependent or higher growth industries gain more if the nonSOE is located in a more liberalized province.

The first key finding, that shares gained broadly on expectations of reduce corruption, is consistent with markets expecting the reforms to be meaningful, rather than propaganda, and beneficial on net to public shareholders. This supports prior work arguing that curtailing corruption has economy-level benefits (Krueger, 1974; Murphy et al., 1991, 1993; Shleifer and Vishny, 1993; Mauro, 1995; and others).

SOE shares' rising broadly is consistent with investors expecting nation-wide implementation of the Eight-point Policy. A key part of the policy is curtailing top cadres' private benefits, and SOEs senior executives are all top cadres. Investors' upward revaluation of SOE shares is consistent with their expecting cadres running SOEs to divert fewer corporate resources to private benefits in the future.

The third key finding, more past ETC correlating with greater gains for nonSOEs in more liberalized provinces and with greater losses for nonSOEs in the least reformed provinces, suggests nonSOEs' ETC served different purposes in different provinces. Greater price gains for higher ETC nonSOEs in more reformed provinces suggests that investors viewed that ETC as more predominantly tolls. This is reasonable because, market institutions being more functional in those provinces, officials' intervention was more predominantly lifting of artificial barriers designed to be lifted for bribe. In less reformed provinces, where officials still allocate key resources, a larger fraction of ETC was likely grease – payments to officials to start the gears of bureaucratic resource allocation turning. If investors expected the Eight-Point Policy to interfere with grease payments, nonSOEs more dependent on grease payments (i.e. nonSOEs with high prior ETC and in the least liberalized provinces) would lose more.

Taken together, these three findings highlight three qualitatively different components of the firm-level costs of official corruption. One is firms' investment in connections with government officials that are essential to "grease bureaucratic gears" to "get anything done" in economic environments where bureaucracies, not markets, allocate resources. A second is firms' payment of "tolls" to officials who then waive regulations designed to obstruct firms that have not paid. A third is top managers, especially in a corrupt environment, diverting corporate resources to finance their private benefits, broadly interpreted to include perks for themselves, their friends,

and their families; connections to advance their careers; and their favor-trading with other members of their patronage networks.

The fourth key finding, which is particularly fundamental, is consistent with investors expecting reduced corruption to unleash market forces to the extent that prior institutional development permits. More market-dependent nonSOEs (those that are more competitive, in more dynamic sectors, and more dependent on external financing) gain more if located where market institutions are already stronger.

More generally and a bit speculatively, this finding is consistent with reduced corruption reinforcing institutional development in provinces with stronger existing institutions, with this allowing yet stronger constraints on corruption, and so on. Such effects operating via market institutions cannot preclude similar effects operating via other dimensions of institutional development – government quality, education, or behavioral norms.

These findings contribute in illuminating the economy-level costs of corruption and of curtailing corruption. Our findings that expected reductions in corruption favor more competitive nonSOEs more in more economically liberalized provinces support the views that corruption renders resource allocation sub-optimal (Murphy *et al.* 1993) and that reducing corruption can improve allocative efficiency more where market institutions are stronger.

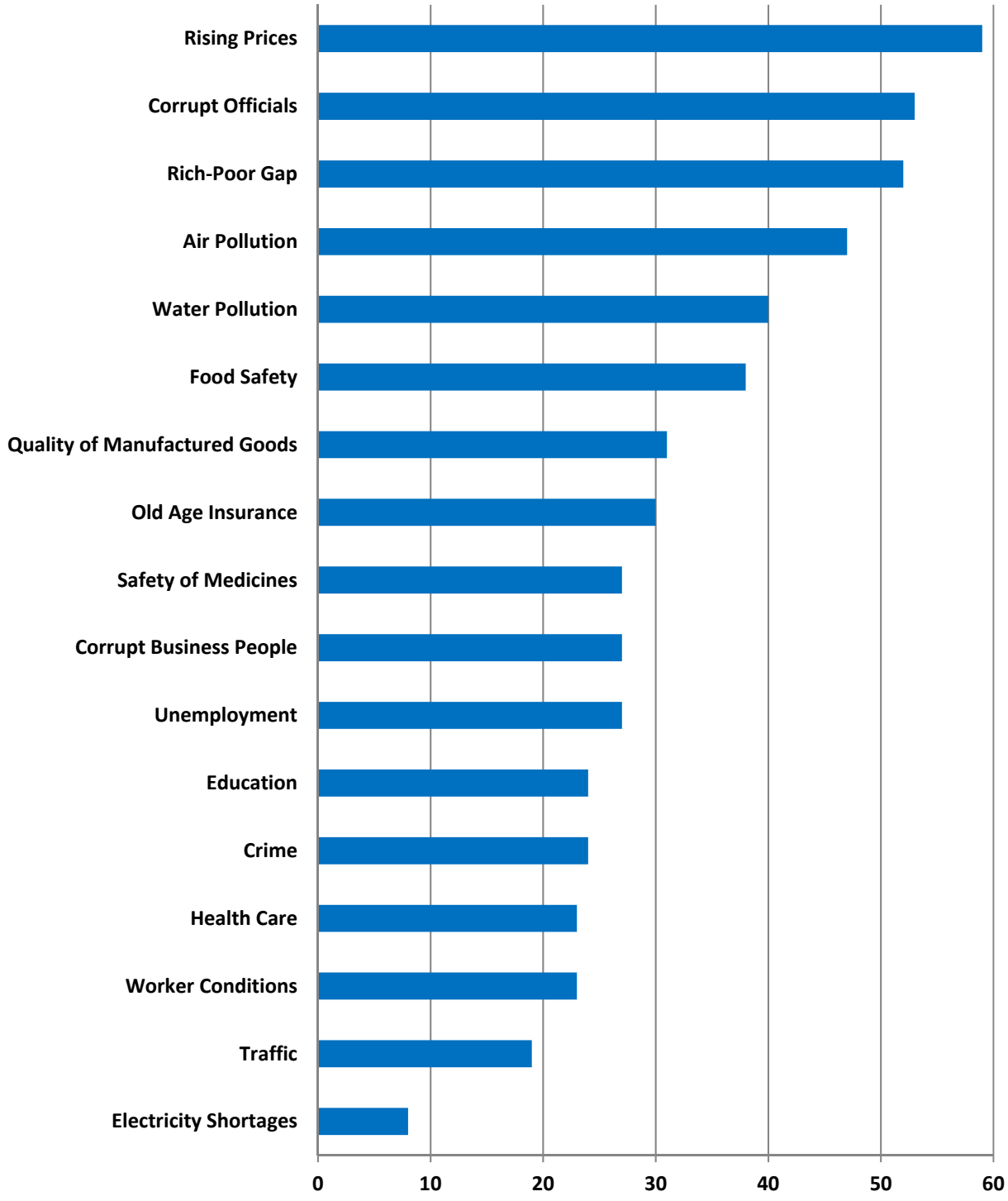
Furthermore, our findings highlighting the complementarity between market liberalizing reforms and corruption-cutting reforms, may well be important for economic development. Our results suggest that extensive market liberalization together with reforms aimed at curtailing corruption may offer a path out of a corruption ridden low-level equilibrium. One factor stabilizing this equilibrium is connected firms' vested interests in preserving the value of their past investment in connections. Market reforms, by eroding the value of these connections, weaken those vested

interests. A second stabilizing factor is officials' vested interests in the benefits they glean from bribery extraction. Market reforms leave officials taking bribes more for removing regulatory obstructions and less as grease for allocating resources markets cannot deliver: tolls are surely less politically defensible than grease. This may well have been a factor in Xi's decision to attack corruption when he did. Furthermore, a genuine anti-corruption campaign may augment growth by strengthening market forces, which lessens inefficiencies in resource allocation. This too may well have featured in Xi's decision.

The complementarities alluded to above then set the stage for path-dependence in institutional development because stronger economic growth, following initial reforms, can build momentum for further reforms. This reasoning means that prior market reforms in Chinese provinces may well correlate with other dimensions of past economic, social, or governmental development. Our main results all survive controlling for lagged education spending, lagged per capita GDP, and lagged GDP growth and suggest that prior market reforms are paramount. However, we cannot preclude all possible alternative development measures. Moreover, distinguishing highly correlated variables subject to different or unknown measurement error problems is econometrically extremely problematic, especially if interaction coefficients are of critical interest (Leamer 1978, pp. 170-81).

Finally, stock markets are not strong form efficient. Even if shareholders' expectations prove incorrect, an event study accurately measures changes in shareholders' expectations – in this case about the effects of reduced future corruption across firms and provinces. If unfolding developments ultimately reveal the Eight-point Policy to be something other than a broad attack on corruption, the event study results remain economically useful as evidence about what investors expected to happen upon a general drop in corruption is surely helpful information.

Figure 1: Fraction of Chinese Respondents Viewing Issues as a "Big Problem"



Source: PEW Survey Research Center Spring 2013 Survey, reported in Financial Times Nov 8 2013 "Inflation, Corruption, inequality top list of Chinese public's concerns"

Figure 2: Online Attention to the Eight-point Policy

Panel A: Daily Baidu internet search volume for 'Eight-point Policy' (in Chinese, 八项规定), indicated by the solid line, and for 'anti-corruption' (反腐), indicated by the dashed line. The event date, Tuesday, December 4th 2012, is indicated by the dark gray band. The three-trading-day window, also includes the darker grey bands around the event date, and the five-trading-day window (which spans the weekend), also includes the light gray bands. Search volumes are scaled by the maximum for 'Eight-point Policy' searches, which occurs on Thursday Dec. 6th 2012.

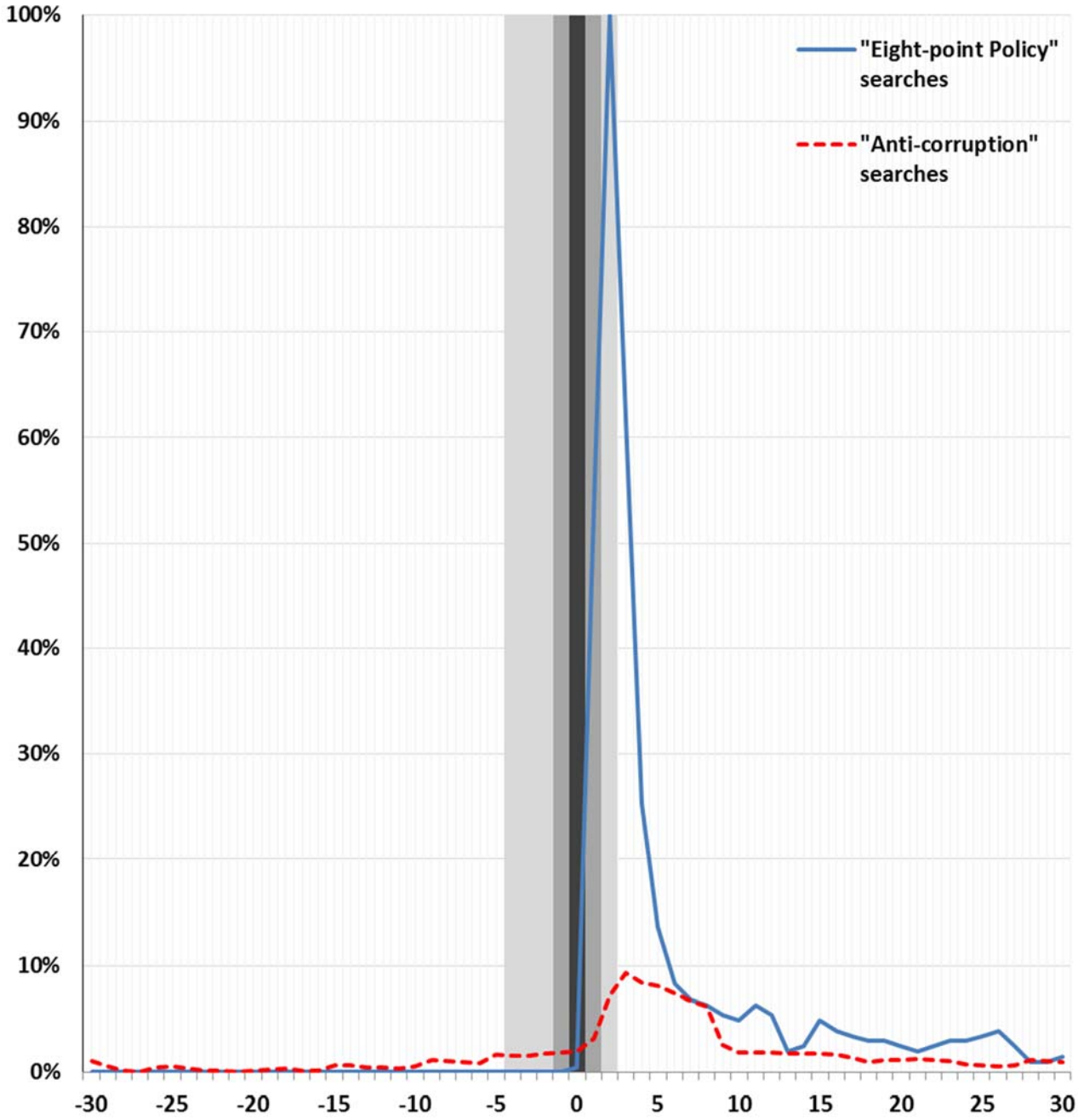


Figure 2 (Continued)

Panel B. Daily Baidu internet search volume for 'Eight-point Policy' (in Chinese, 八项规定), indicated by the solid line, and for 'Economic Development' (经济发展), 'Economic Growth' (经济增长), and 'Economic Reform' (经济改革) indicated by successively finer dashed lines. The event date, Tuesday, December 4th 2012, is indicated by the dark gray band. The three-trading-day window, also includes the darker grey bands around the event date, and the five-trading-day window (which spans the weekend), also includes the light gray bands. Searches are scaled by the maximum for 'Eight-point Policy' searches, which occurs on Thursday Dec. 6th 2012.

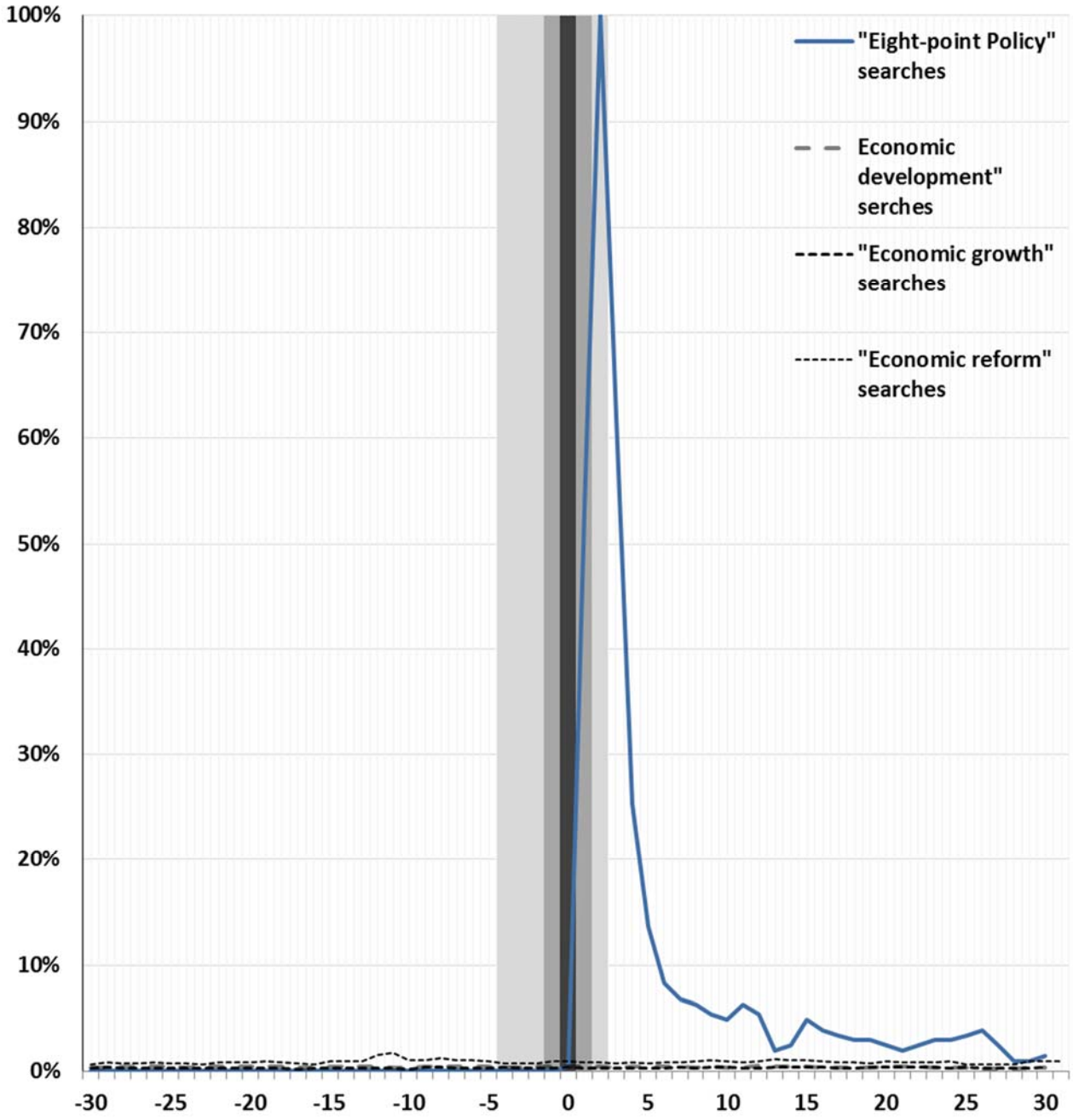


Figure 3. Hong Kong listed mainland Chinese firms versus other Hong Kong firms

Cumulative total return indexes of all mainland firms (H shares) listed on the Hong Kong Stock Exchange and all other stocks listed there before and after the event date, the Party's December 4th 2012 adoption of the Eight-point Policy to curtail corruption in the Party's ranks of leading cadres. Both indexes are normalized to 100% at the beginning of the five-day event window surrounding the event date.

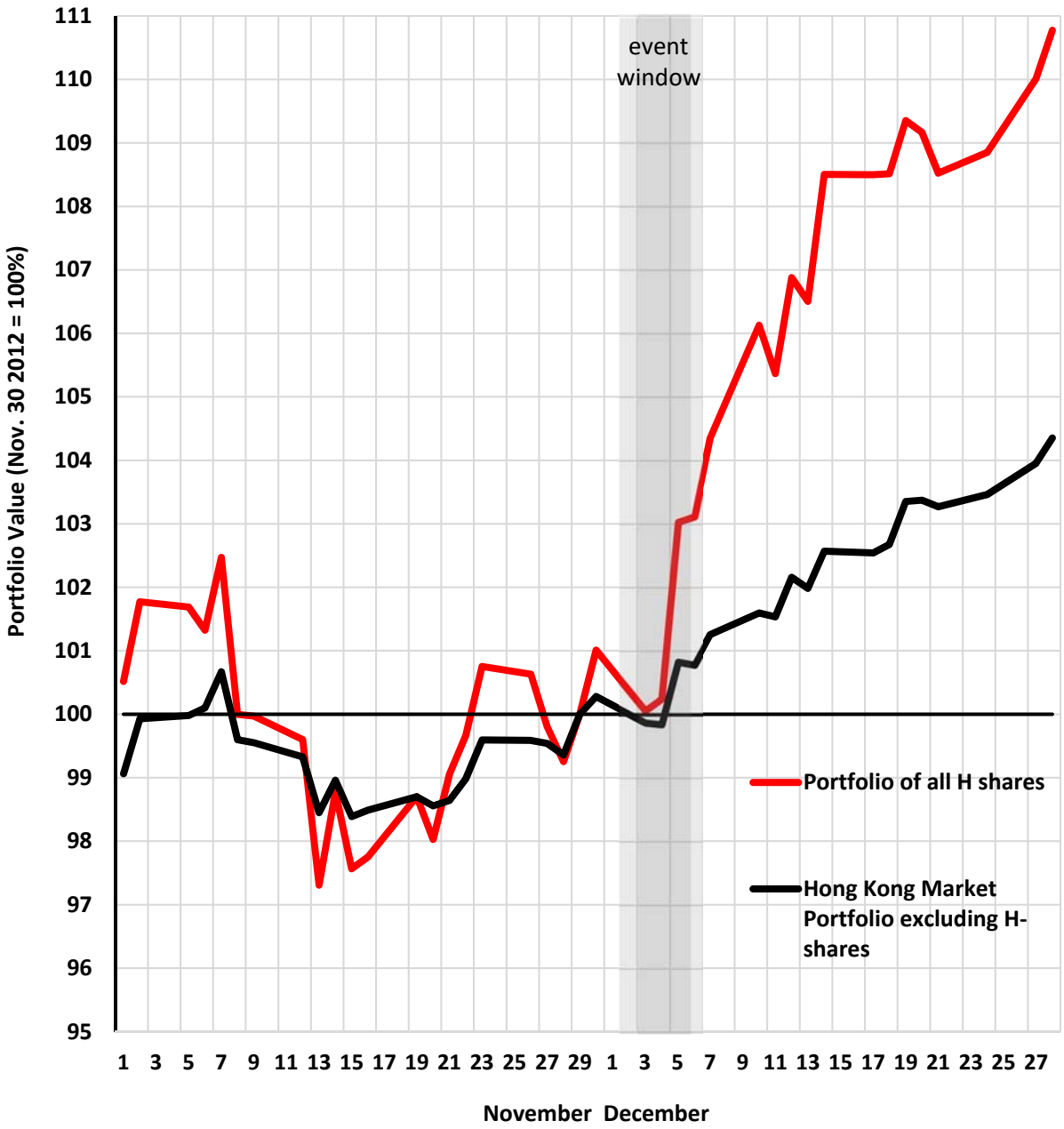


Figure 4: Chinese market index before and after the initiation of the Eight-point Policy

Cumulative return of a value-weighted portfolio of all listed shares on China's two mainland stock exchanges, the Shanghai Stock Exchange and the Shenzhen Stock Exchange. Successively darker grey bands indicate five day and three-day event windows and the event date, the Party's December 4th 2012 adoption of the Eight-point Policy to curtail corruption in the Party's ranks of leading cadres.

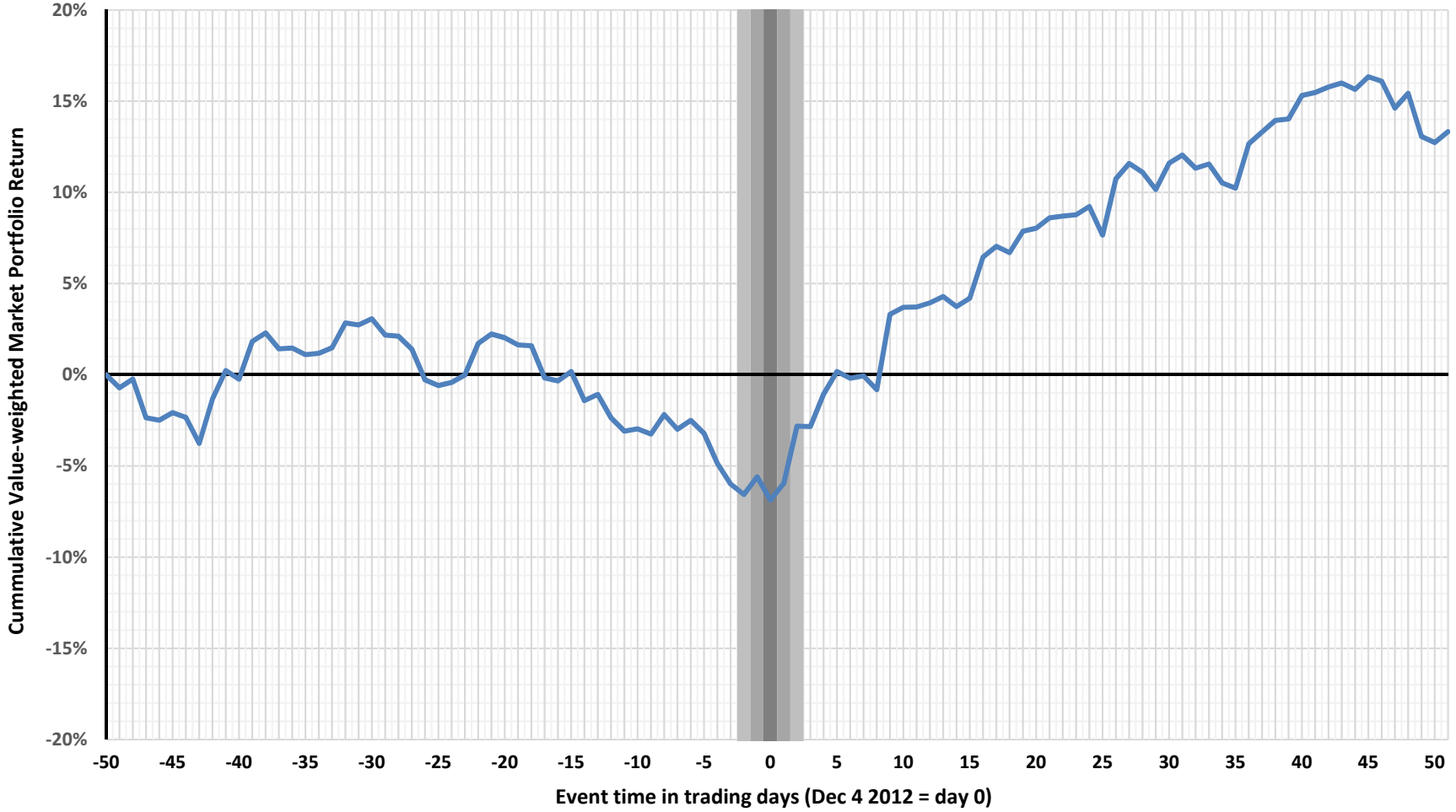


Table I
***Marketization* Index by province-level Jurisdiction**

Higher Marketization index indicates more progress towards implementing market reforms. Province-level jurisdictions include provinces, province-level cities and autonomous regions. Indexes and subindexes are described in detail in Appendix I.

Province	*Marketization*	Province	*Marketization*
1. Zhejiang	11.8	17. Hebei	7.3
2. Jiangsu	11.5	18. Jilin	7.1
3. Shanghai	11.0	19. Hainan	6.4
4. Guangdong	10.4	20. Inner Mongolia	6.3
5. Beijing	9.9	21. Guangxi	6.2
6. Tianjin	9.4	22. Shanxi	6.1
7. Fujian	9.0	23. Heilongjiang	6.1
8. Shandong	8.9	24. Yunnan	6.1
9. Liaoning	8.8	25. Ningxia	5.9
10. Chongqing	8.1	26. Shaanxi	5.7
11. Henan	8.0	27. Guizhou	5.6
12. Anhui	7.9	28. Xinjiang	5.1
13. Jiangxi	7.7	29. Gansu	5.0
14. Hubei	7.7	30. Qinghai	3.3
15. Sichuan	7.6	31. Tibet	0.4
16. Hunan	7.4		

Source: National Economic Research Institute (NERI) data as reported by Fan et al. (2011)

Table II
Stock Market Reaction and Differentiate by Marketization

This table reports value-weighted cumulative stock returns of market portfolios around the announcement of the Eight Point Policy on Dec. 4th 2012. Portfolios contain all firms, non-state-owned enterprises (nonSOEs) only, or state-owned enterprises (SOEs) only; firms in all provinces, low (bottom tercile) *Marketization* provinces, or high (top tercile) Marketization provinces and all combinations thereof. Marketization gauges provinces' progress in implementing market reforms. Differences between nonSOEs and SOEs and between stocks in high versus low-*Marketization* provinces are also computed. Panel A uses a 3-day event window. The standard deviation used to test whether *CR(-1, 1)* is significantly different from zero is the square root of 3 times the variance of daily stock returns from day -211 to day -11. Panel B uses a 5-day window. The standard deviation used to test whether *CR(-2, 2)* is significantly different from zero is the square root of 5 times the variance of daily stock returns from day -211 to day -11. Significance at the 10%, 5%, and 1% level is indicated by *, **, and ***, respectively.

Panel A: Mean 3-day cumulative returns, *CR*(-1, 1)

	All firms	**nonSOEs**	**SOEs**	**nonSOE minus SOE**
All provinces	2.77*	2.44	2.94**	-0.51***
Low *Marketization* provinces	0.54	-2.72*	3.27*	-5.99***
High *Marketization* provinces	3.20**	3.03*	3.28**	-0.25
High minus low *Marketization* provinces	2.66***	5.75***	0.01	

Panel B: mean 5-day cumulative raw returns, *CR*(-2, 2)

	All firms	**nonSOEs**	**SOEs**	**nonSOE minus SOE**
All provinces	3.86**	3.55*	4.01**	-0.46**
Low *Marketization* provinces	0.98	-3.00	4.30*	-7.30***
High *Marketization* provinces	4.46**	4.38*	4.50**	-0.13
High minus low *Marketization* provinces	3.49***	7.38***	0.20	

Table III

Summary Statistics for Main Variables

Variables definitions and descriptions are provided in Appendix I

Samples	All firms		nonSOEs		SOEs	
N	2,024		1,173		851	
	Mean	Std.	Mean	Std.	Mean	Std.
3-day cumulative return CR(-1, 1), %	2.54	3.43	2.41	3.25	2.71	3.67
5-day cumulative return CR(-2, 2), %	3.77	4.65	3.55	4.43	4.09	4.92
Entertainment and travel costs (*ETC*)	1.46	1.98	1.75	2.18	1.06	1.58
Marketization	9.15	2.07	9.56	2.00	8.59	2.05
Growth Potential (*Q*)	2.94	2.43	3.18	2.64	2.60	2.06
External Finance Dependence (*EFD*)	-0.59	2.95	-0.44	2.71	-0.79	3.25
Total Factor Productivity (*TFP*)	2.84	5.49	3.02	5.49	2.60	5.49
GDP Growth, %	11.75	1.88	11.56	1.75	12.02	2.02
Log(*GDP per capita*)	10.59	0.45	10.63	0.41	10.52	0.49
Education Spending/GDP, %	2.69	1.16	2.52	1.10	2.92	1.21
Firm Size (log of *Total Assets*)	21.67	1.31	21.24	1.06	22.26	1.40
Leverage (*Liabilities*/*Total Assets*)	0.46	0.62	0.40	0.76	0.55	0.31
Research and Development (R&D/sales)	0.02	0.03	0.02	0.03	0.01	0.02

Table IV
Regression Analyses on Firm-level Cumulative Returns

Regressions explain 3-day (Panel A) and 5-day (Panel B) cumulative returns, relative to industry fixed effects. Explanatory variables include the market reform index (*Marketization*), Entertainment and Travel Costs (*ETC)*, and *Total Factor Productivity,* provincial *GDP Growth*, Log(*per capita GDP*), *Education Spending/GDP*, and firm-level controls (*Firm Size*, *Leverage*, and *R&D*). Regressions also include interactions of *Marketization* with *External Finance Dependence* (industry fixed effects subsume *External Finance Dependence* main effects), *Growth Potential* (industry fixed effects subsume *Growth Potential* main effects), and *ETC* and *Total Factor Productivity*. Appendix I presents detailed definitions of all variables. P-values are in parentheses. Significance at 10%, 5% and 1% levels indicated by *, **, and ***, respectively.

Panel A: Explained variable is 3-day cumulative raw return *CR(-1,1)*

Subsamples	nonSOEs		SOEs	
	(1)	(2)	(3)	(4)
Marketization	0.181***	0.047	-0.169*	-0.135
	(0.00)	(0.58)	(0.09)	(0.26)
× *Growth Potential*		0.037***		0.007
		(0.00)		(0.60)
× *External Finance Dependence*		0.019***		-0.011
		(0.00)		(0.34)
× *Total Factor Productivity*		0.029**		-0.027*
		(0.02)		(0.08)
× *ETC*		0.029**		-0.040*
		(0.03)		(0.05)
Total Factor Productivity	0.040**	0.030	0.021	0.030
	(0.03)	(0.12)	(0.60)	(0.45)
ETC	-0.111***	-0.136***	0.044	0.099**
	(0.00)	(0.00)	(0.40)	(0.04)
GDP Growth	0.208***	0.213***	-0.044	-0.041
	(0.00)	(0.00)	(0.35)	(0.41)
Log(*GDP per capita*)	0.208*	0.223	-0.073	-0.097
	(0.06)	(0.29)	(0.72)	(0.63)
Education Spending/GDP	0.238***	0.227*	-0.194	-0.166
	(0.00)	(0.06)	(0.239)	(0.31)
P-value of *Marketization* and its cross terms joint F-test		0.04		0.06
Controls & Industry Fixed Effects	Yes	Yes	Yes	Yes
Bidirectional clustering by	Prov, Ind	Prov, Ind	Prov, Ind	Prov, Ind
Observations	1,173	1,173	851	851
Adjusted R-squared	0.057	0.062	0.075	0.078

Panel B: Explained variable is 5-day cumulative raw return *CR(-2,2)*

Subsamples	nonSOEs		SOEs	
	(1)	(2)	(3)	(4)
Marketization	0.266**	0.128	-0.138	-0.155
	(0.02)	(0.35)	(0.17)	(0.21)
× *Growth Potential*		0.029***		0.034**
		(0.00)		(0.02)
× *External Finance Dependence*		0.035***		-0.016**
		(0.00)		(0.02)
× *Total Factor Productivity*		0.026*		-0.023
		(0.05)		(0.23)
× *ETC*		0.059***		-0.062**
		(0.00)		(0.03)
Total Factor Productivity	0.071***	0.060***	0.085	0.092
	(0.00)	(0.00)	(0.21)	(0.15)
ETC	-0.199***	-0.249***	0.076	0.158**
	(0.00)	(0000)	(0.17)	(0.02)
GDP Growth	0.287***	0.284**	-0.098	-0.089
	(0.00)	(0.01)	(0.24)	(0.32)
Log(*GDP per capita*)	0.172	0.223	-0.453**	-0.499**
	(0.50)	(0.50)	(0.034	(0.02)
Education Spending/GDP	0.375**	0.354*	-0.176	-0.139
	(0.05)	(0.09)	(0.41)	(0.51)
P-value of *Marketization* and its cross terms joint F-test		0.04		0.03
Controls & Industry Fixed Effects	Yes	Yes	Yes	Yes
Bidirectional clustering by	Prov, Ind	Prov, Ind	Prov, Ind	Prov, Ind
Observations	1,173	1,173	851	851
Adjusted R-squared	0.099	0.105	0.090	0.093

Appendix I
Variable Descriptions

Variables	Descriptions
CR(-1, 1)	Three trading-day cumulative stock return around the initiation of the Eight-point Policy on Dec. 4th 2102, in percent.
CR(-2, 2)	Five trading-day cumulative stock returns around the Dec. 4th 2012 initiation of the Eight-point Policy, in percent.
ETC	Entertainment and travel costs as percent of sales in 2011.
SOEs	Indicator variable set to one if the firm is ultimately controlled by the state or state organs and to zero otherwise, using a 30% "weakest link in the control chain" rule as per CSMAR (China Stock Market and Accounting Research) and CSRC (China Securities Regulatory Commission) guidelines.
Marketization	A summery index measuring progress in implementing market reforms for each of China's province-level jurisdictions (provinces, province-level cities, and autonomous regions). A higher index means more complete market reforms. Source: Fan et al (2011).
Growth Potential	Industry-average market value over book value of equity.
External Finance Dependence (EFD)	Industry average capital expenditures less cash flow from operations, all divided by capital expenditures.
Total Factor Productivity (TFP)	Total factor productivity, estimated for each firm using the methodology developed by Levinsohn-Petrin (2003).
GDP Growth, %	Province real GDP growth, averaged over 2009 to 2011.
Log(*GDP per capita*)	Log of province real GDP *per capita*, averaged over 2009 to 2011.
Education Spending/GDP, %	Province education expenditures over GDP, averaged over 2009 to 2011.
Firm Size Log(total assets)	The logarithm of firm total assets.
Leverage Liabilities/total assets	Firm total liabilities over total assets.
Research and Development (R&D/sales)	Firm research & development expenses over total sales, set to zero for firms not reporting research and development spending.

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