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# How does anti-corruption affect corporate innovation? Evidence from recent anti-corruption efforts in China

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## ABSTRACT

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This paper investigates the effect of anti-corruption on the financing and investing in innovation by using a detailed dataset of Chinese listed companies from 2009 to 2015. We find that stronger anti-corruption efforts make firms more likely to acquire external funds, mainly the long-term debt. Moreover, we show that firms located in provinces with stronger anti-corruption efforts invest significantly more of their newly acquired funds in R&D and generate more patents. Further empirical tests suggest this positive and statistically significant effect almost comes entirely from the current massive anti-corruption campaign launched by President Xi Jinping since 2013. We further test two mechanisms regarding the corruption-innovation nexus: the expropriation hypothesis and the rent-seeking hypothesis. The results show that only firms without political connections, non-state owned enterprises (non-SOEs), firms operating in non-regulated industries and younger firms benefit from the stronger anti-corruption efforts, all supportive of the former mechanism. *Journal of Comparative Economics* 000 (2016) 1–23. Graduate School of Economics, Kyoto University Yoshida-honmachi, Sakyo-ku, Kyoto, 606-8501 Japan.

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## 1. Introduction

Corruption has become one of the central social and political issues in China and has increased to an epidemic level since the advent of the “reform and opening policy” in 1978. Moreover, corruption in China is becoming more intensified and institutionalized in the sense that high-level, big-stakes corruption increased more rapidly than ordinary ones (Wedeman, 2004). Even though the Chinese leaders never stop their efforts in fighting corruption, it is only since President Xi Jinping came to power after 18th Congress of the Communist Party of China (CCPC) in late 2012 that a large-scale systematic anti-corruption campaign has been put in place. However, as the anti-corruption campaign continues and deepens, some critics begin to cast doubt on the real impact of the anti-corruption campaign, contending that anti-corruption is detrimental to the country’s economy. How does anti-corruption affect the economy? Is it beneficial or detrimental to economic development? However, to our knowledge no previous studies have ever tackled this important topic empirically. In this paper, we try to address this question by shedding light on the causal effect of anti-corruption on innovation, one of the most important driving forces of economic growth. Thus, our study both tries to fill this gap in literature and aims to provide policy

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implications with respect to whether the current anti-corruption campaign should continue based on systematic empirical analyses.

With respect to the link between corruption and innovation, it has received very limited attention relative to the large strand of literature focusing on the effects of corruption on economic performance indicators.<sup>1</sup> [Murphy et al. \(1991\)](#) argue that innovators are particularly vulnerable to expropriation by government officials due to their inelastic need for government services such as permits and licenses, resulting in high risks, uncertainty and vulnerability. [Blackburn and Forgues-Puccio \(2009\)](#), however, show that the effects of corruption depend on the extent to which bureaucrats coordinate their rent-seeking behavior. Several empirical studies using firm-level data generally come to the conclusion that corruption is detrimental to innovation and put innovative firms at a disadvantage (e.g., [Waldemar, 2012](#); [Paunov, 2016](#); [Habiayremye and Raymond, 2013](#)), and [Anokhin and Schulze \(2009\)](#) show similar results by analyzing cross-country macro data.

This paper tries to provide insights into this important topic from a very different perspective by exploring the causal impact of anti-corruption on innovation. We focus on China's anti-corruption mainly for two reasons. First, China has long been plagued by corruption since the foundation of PRC. Corruption has managed to flourish and even become more rampant over time, despite the introduction of some anti-corruption campaigns. However, shortly after Xi Jinping came to power in late 2012, he launched an unprecedentedly massive anti-graft campaign in the history of Communist rule in China. This creates a precious opportunity to understand and study anti-corruption, an issue closely related to corruption, yet left unexplored in literature. Second, as the largest developing economy with unbalanced development across its regions, anti-corruption effort (also corruption) within China varies greatly across provinces and time (especially between pre-2013 and post-2013). The geographical diversity along with its evolution over time provides wide variations needed for identifying the effect of anti-corruption while making us still able to control the relatively homogenous underlying institutional and cultural factors within the country.

We adopt two measures of anti-corruption in this paper. The first one is the standardized provincial number of officials of vice county-division rank and above investigated in the registered corruption cases each year, reported by the Procuratorial Yearbook of China. In the case of China, this proxy typically reflects the efforts devoted in anti-corruption by individual provinces rather than corruption itself. The second one measures the determinations and commitments of the provincial leaders along with its Commission for Discipline Inspection (CDI) to fight corruption in coordination with the Party Central Committee. As the provincial official newspaper of Communist Party of China (CPC) mainly serves a crucial function of promoting policy directives and shaping public opinions, the number of articles published in provincial CPC newspaper that advocate anti-corruption or denounce corruption is expected to well capture the provincial anti-corruption efforts. We employ the data of Chinese listed companies from CSMAR database, which allows us to construct a rich panel spanning a relatively long time period with the latest data also available.

We propose that anti-corruption campaigns can be conducive to the financing and investing in corporate R&D mainly by mitigating the expropriation problem. When corruption is pervasive, firms are reluctant to innovate due to the high probability that their rents generated from risky innovative activity will be expropriated by corrupt-prone bureaucrats (the expropriation hypothesis). This significantly aggregates the risks and uncertainty associated with innovative pursuits. In this sense, firms located in provinces with stronger anti-corruption intensity are expected to both get access to and invest more funds for R&D, which may lead to more patents as a result, due to a higher expected return to innovation.

Our concerns for the causal effect of anti-corruption include the existence of unobserved provincial factors that may correlate with both anti-corruption efforts and the financing & investing behavior of the firms, as well as the potential reverse causality, generated by the mechanism where a higher level of financing and investing in innovation may result in a greater demand for anti-corruption. We address these concerns by adopting system GMM developed by [Arellano and Bover \(1995\)](#) and [Blundell and Bond \(1998\)](#). This approach can not only control for the firm-level unobservable heterogeneity, but can also deal with the potential endogeneity of all the regressors by using their own lags as instruments. To increase the identification power of GMM, we further use two historical variables measuring the extent to which individual province was once exposed to the Anglo-American influence and a dummy indicating whether the province's Secretary of Committee for Discipline Inspection (SCDI) is "airborne" as three external IVs for anti-corruption. These variables are expected to be correlated with the provincial anti-corruption efforts while basically unlikely to directly affect the financing and investing behavior in corporate R&D.

We find that stronger anti-corruption efforts can make firms more likely to have access to external funds, mainly long-term debt. Moreover, the empirical results suggest that firms located in provinces with stronger anti-corruption efforts invest a significantly larger proportion of their newly acquired funds in R&D and generate more patents. Further empirical tests suggest this significantly positive effect comes entirely from the current massive anti-corruption campaign launched by President Xi Jinping since he came to power in late 2012. Thus facilitating financing and investing in R&D is one of the potential channels through which anti-corruption efforts can positively affect economic growth.

However, besides the expropriation hypothesis, another mechanism may also account for the negative impact of corruption on firms' innovation. As implied by [Baumol \(1990\)](#) and [Murphy et al. \(1991\)](#), when the relative payoff of corruption is

<sup>1</sup> A large number of early studies using cross-country data generally find that a higher level of corruption is associated with lower economic growth (e.g., [Mauro, 1995](#); [Mo, 2001](#)), less foreign direct investment (e.g., [Wei, 2000](#)) and more social unrest (Manion, 2004). Among the empirical literature that examines the effect of corruption on firm performance by using firm-level survey data, the conclusions are mixed (e.g., [Fisman and Svensson, 2007](#); [Cai et al., 2011](#); [Hellman et al., 2003](#)).

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