Collusive Public Corruption, Corporate Cash Holdings, and Capital Expenditures: Evidence from the United States

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Abstract

This study examines how collusive public corruption in the form of misusing corporate cash holdings resulted in increased capital expenditures in the US over the period of 1976-2019. These effects manifest among firms in the introduction, growth, and mature stages of the corporate life cycle. A strong and positive effect on capital expenditures of collusive public corruption in the form of misusing corporate cash is evident for firms located in the Midwest region, whereas the effects for those located in the West region are strong and negative. The results of the analyses reveal an impact of collusive public corruption on accounting treatments of capital expenditures.

Keywords: collusive public corruption, corporate cash holdings, capital expenditures

1. Introduction

Public corruption is an agency problem between public officials and firms. Although there are laws governing transactions that may be affected by public corruption, these laws are not enforceable in courts as long as firms transact with different officials over time (Harstad and Svensson 2011). Public corruption is evident in illicit transactions (i.e., bribery, kickbacks, or economic extortion) between public officials and their constituents, and it can be coercive or collusive in nature, depending on the level of economic friction in a given society (Alexeev and Song 2013; Shleifer and Vishny 1993). Coercive public corruption is equivalent to rent extraction by bureaucrats and ranges from petty harassment to asset extortion (Caprio et al. 2013; Tran 2020). Collusive public corruption is evidenced in pay-to-play relationships between bureaucrats and firms, in which firms voluntarily pay bribes to bureaucrats to overcome impediments caused by governmental inefficiency. Examples include protection against foreign competition, policies that induce barriers to trade, or hedging against changeable bureaucrats to promote innovation and economic growth (Ades and Tella 1999; Ayyagari et al. 2014; Leff 1964; Svensson 2003; Tran 2020). Both types of public corruption shift firms' incentives from increasing productivity for growth to transferring transaction costs to capital market participants as a means of courting bureaucrats (Alexeev and Song 2013; Butler et al. 2009; and Dass et al. 2016, among others).

Research on actual public corruption cases revealed details of convictions of market participants involved in transactions that are illegal in the accepted public equity-based, market-based American financial system (Acharya et al. 2011; Harstad and Svensson 2011; Brown and Petersen 2009). In addition, laws against corrupt deals are unlikely to be enforceable in courts when firms deal with different officials over multiple years. Finally, bureaucrats expect hefty bribes due to their exclusive positions (Harstad and Svensson 2011).

1.1 Significance of this Study

This article examines how public corruption in the form of misusing corporate cash holdings increases capital expenditures (CAPEX). Current accounting practice related to CAPEX provides ample opportunities for managerial discretion; overcapitalizing property, plant, and equipment (PP&E) and choosing to use either principle-based (IFRS) or rule-based (US GAAP) standards are examples. These strategies involve interaction with public officials to initiate major capital projects, which can impact investment decision-making by both domestic and international capital market participants.

This study investigates the impact on CAPEX of collusive public corruption in the form of misusing corporate cash holdings instead of the impact on PP&E for two reasons: 1) CAPEX captures managerial discretion over capital

investment in response to collusive public corruption, whereas 2) PP&E is used to shelter corporate assets as a response to coercive public corruption. For example, a firm can channel corporate cash holdings into PP&E to minimize political extraction by sheltering assets in countries with low shareholder protection, whereas corruption is negatively associated with corporate cash holdings in countries with adequate shareholder and creditor protections (i.e., the US and UK), where firms use cheap credit rather than cash to shelter assets (Caprio et al. 2013; Tran 2020). Thus, the influence on CAPEX of public corruption in association with corporate cash holdings for the purpose of expanding assets in a country with developed shareholder and creditor protections is an empirical question.

The primary hypothesis of this study is that a quid pro quo between firms and bureaucrats using corporate cash holdings increases CAPEX in the process of executing capital projects when firms operate in corrupt state business environments, despite the boundary of strong national legal and financial systems such as those in the US. Collusive public corruption in the form of misused corporate cash holdings and its influence on CAPEX may be reflected on the balance sheet without violating accounting rules because managers may exercise discretion over cash transfers to specific assets that have minimal value; this is true even for projects without managerial involvement (Shleifer and Vishny 1989).

The baseline results of the analysis show that firms located in more corrupt states or districts tend to misuse corporate cash holdings as CAPEX. To address potential limitations regarding the data on conviction, this study also uses a survey-based State Integrity Index to create a variable representing corruption perception, which reflects journalists' perceived risk of corruption in relation to campaign financing, ethics laws, lobbying regulations, and management of state pension funds as well as states' assessments of their own governments' accountability and transparency. The results of this study confirm that collusive public corruption in the form of misusing corporate cash holdings has a direct impact on CAPEX.

This paper can aid accounting academics, practitioners, and regulators in several ways. While prior accounting studies show how public corruption itself impedes firm performance and growth (Johnson et al. 2011; Dass et al. 2016; 2021), innovation (Ellis et al. 2020; Huang and Yuan 2021), financial policies or securities markets (Butler et al. 2009; Smith 2016; Tran 2020), or audit fees (Jha et al. 2021), this study specifically examines how collusive public corruption in the bureaucrat-firm relationship in the form of misusing corporate cash holdings increases CAPEX via managerial discretion over accounting treatments. Second, this study adds to the insights of prior studies, demonstrating that firms in the early stages and agglomerations of firms in specific regions are susceptible to collusive public corruption in relation to capital investment. Unless the problem identified in this study is carefully addressed, capital investment will remain less than optimal even after shareholder and creditor protections are increased at the national level which, in turn, will lead to a negative impact on regional economies and capital market participants in both domestic and global financial markets.

1.2 US Setting

Given that CAPEX is a well-known loophole for accounting manipulation in the US, this study utilizes the US setting, where firms can get around regulatory constraints by constructing cooperative relationships with bureaucrats by either bribing them or engaging in legal lobbying activities. US managers are unlikely to record misused cash holdings on income statements for several reasons. First, American multinational firms recognize the immediate necessity of entertainment and travel costs as part of selling, general, and administrative expenses (SG&A) from an external audit perspective. For example, entertainment and travel costs are widely incurred while building relational capital with customers, suppliers, and bureaucrats in both domestic and international markets. For this reason, many firms have stringent internal policies and guidelines to mitigate the risk of significant penalties from the government (Cornaggia et al. 2021; Zeng et al. 2016). Under these conditions, managers are less likely to be incentivized to disguise collusive corruption as SG&A. Second, unless a firm's performance improves substantially in the short term, its earnings will not meet analysts' expectations and the market price of its securities will decline. Therefore, managers pursue the net benefit of capitalizing on corporate cash holdings over multiple years, recording it on the balance sheet rather than expensing it on the income statement at the time when the expense was incurred to avoid a negative impact on current earnings and to recoup net benefits from completed expensive capital projects in the future.

For example, WorldCom, Inc. treated current expenses (i.e., lease payments to the third-party carrier) as CAPEX without substantiated evidence to justify such treatment. The company's intention was to increase earnings before interest and taxes by disguising expenses as capital assets (Securities and Exchange Commission, 2003). Anecdotal evidence suggests that many American firms entered into multi-million-dollar agreements with local governments to build facilities and are bound by contract terms and conditions to meet their long-term commitments. For instance,

American firms increased CAPEX after COVID-19 to recover losses from disrupted business operations by automating manufacturing and revamping manufacturing facilities to increase sustainable growth. This treatment of CAPEX, in turn, could result in further collusive public corruption. See Appendix A 10-K disclosures in 2021.

1.3 Corporate Life Cycle

There are five stages in the corporate lifecycle: introduction, growth, maturity, shake-out, and decline (Gort and Klepper 1982). Introduction is when innovation flourishes; growth occurs when production based on innovation is marketable; a firm reaches maturity when maximum production is reached; shake-out is the stage when production starts diminishing; and decline indicates a zero net entry in the market. To explain how the effects on CAPEX of collusive public corruption in the form of misusing corporate cash holdings are related to firm characteristics, I conduct subsample analyses based on the corporate life cycle using comprehensive portfolios of firm strategy, asset structures, and various economic fundamentals. In particular, I employ Dickinson's (2011) parsimonious proxy of the relationship between the corporate life cycle and cash flows, which predicts the future profitability of firms not influenced by the value of earnings (Lev and Zarowin 1999). The analysis reveals how collusive public corruption in the form of misusing corporate cash holdings influences CAPEX at different points in the corporate life cycle in terms of profitability, growth, and risk.

I posit that collusive public corruption using corporate cash holdings is more likely to increase CAPEX among firms in the introduction, growth, and maturity stages because young and growing firms are at a disadvantage in terms of obtaining the necessary permits or clearance to expand their assets unless they build relationships with bureaucrats. By contrast, firms in the shake-out and declining stages are not likely to use corporate cash holdings to increase CAPEX because they already have established connections with bureaucrats. They may instead choose to lobby the government and share related costs among interest groups in order to change existing regulations (Dass et al. 2016). The results of the analysis indicate that collusive public corruption in relation to cash increases CAPEX in firms that are in the introduction, growth, and maturity stages of the firm life cycle, all other things being equal.

1.4 Regional Effects

I further investigate whether the effects on CAPEX of collusive public corruption in the form of misusing corporate cash holdings differ according to regional characteristics within the US. Plans for capital investment at the firm level usually involve support from the federal or state government. Firms have a strategic choice in taking advantage of regional development programs, empowerment zones, and special economic zones (Busso et al. 2013; Kline and Moretti 2014; Xie et al. 2016). In some circumstances, they may experience a lack of competition, wage premiums, low labor productivity, union fortification, and low research and development in new industries (Alder et al. 2014; McQuarrie 2017; Xie et al. 2016). The incentive is great to secure economic rent with corrupt bureaucrats which, in turn, deteriorates overall productivity.

Collusive public corruption in the form of misusing corporate cash holdings is likely to be evident in firms in competitively disadvantaged regions, which opt to increase CAPEX to sustain their pay-to-play relationships with bureaucrats to maintain regional wealth. The results of the analysis indicate that this is true among firms located in the Midwest region, but not in the West region, all other things being equal.

1.5 Hypothesis Development

Public corruption creates opaque information environments due to the agency conflict between corrupt bureaucrats and firms; in such environments, value is ultimately transferred away from investors (Borisov, Goldman, and Gupta 2016; Dass et al. 2021; Johnson et al. 2011; Laffont and Tirole 1991; Nur-tegin and Jakee 2020; Shleifer and Vishny 1993). Increased corruption requires considerable government intervention to correct the resulting market failure, which leads to persistent and pervasive hold-up problems between public officials and firms (Mauro 1995; Tiongson, Davoodi, and Gupta 2000; Tran 2020).

When coercive public corruption is rampant, transparency among capital market participants, including firms, shareholders, and creditors, is lacking, and market participants are unprotected from political extraction by inadequate legal and financial systems (Durnev and Fauver 2008). Under these conditions, bribery to mitigate predation becomes customary (Claessens, Feijen, and Laeven 2008; Kim, Mauer, and Sherman 1998; Tahoun 2014; Wei and Kaufmann 1999; Svensson 2003; Xu, Zhang, and Yano 2017), firms increase cash holdings to reduce external costs (Kim, 1998; Opler et al. 1999), and investment tends to decrease to limit the government's bargaining power, which ultimately limits corporate profits and economic growth for society as a whole (Asiedu and Freeman 2009; Harstad and Svensson 2011).

In response to coercive public corruption, firms strategically allocate firm-level resources, converting them from

liquid assets to hard assets to protect those assets from rent-seeking bureaucrats who have direct power over property rights and limit the government's ability to do good (Shleifer and Vishny 1993). Asset structures can be altered in ways that make extortion difficult or costly, although optimal asset structures benefit shareholders (Durnev and Fauver 2008; Stulz 2005). For example, firms may choose to decrease liquidity and increase leverage, PP&E, inventory, and dividends to convert cash to tangible assets and shield corporate assets (Caprio, et al. 2013; Smith 2016).

On the other hand, when national legal and financial systems are adequate, collusive public corruption is pervasive because firms have more flexibility to build pay-to-play relationships with different corrupt bureaucrats (Alexeev and Song 2013; Tran 2020). For example, in the US, large firms systematically build up interest groups to lobby the government, and small firms are typically associated with bribes (Harstad and Svensson 2011). In such business environments, firms may withhold a large amount of cash, protecting it from market scrutiny, which leads to a quid pro quo between bureaucrats and firms (Easterbrook 1984; Jensen 1986). For firms with large cash holdings, managers are less likely to reduce commitments to specific assets that have little value without them (Shleifer and Vishny 1989). Under these conditions, managers reduce investors' ability and incentive to threaten liquidation, which transfers value away from investors to managers (Myer and Rajan 1998). For example, in US firms with weak corporate governance, controlling managers may spend cash more quickly than those in firms with strong governance. In addition, they are more likely to spend on acquisitions and capital expenditures (Harford et al. 2008).

To summarize, when firms operate in corrupt business environments, public corruption draws their attention away from creating optimal asset structures, which results in either wasted firm resources sheltered in the form of hard assets, or overspending on rent-generating projects that deviate from sound economic development plans. In particular, when firms take on long-term, high-risk capital projects that require frequent interactions with bureaucrats to comply with regulatory guidelines (i.e., licensing, safety inspections, and building permits), managers may try to circumvent government regulatory idiosyncrasies in order to expedite licensing or inspection processes (Ellis et al. 2020; Huang and Yuan 2021; Murphy et al. 1993). To do this, they may increase CAPEX to guarantee inventory, fixed assets, PP&E, preferred conditions, and optimal location; any directly related costs can be capitalized on the balance sheet over multiple years.

Firms in corrupt business environments recognize that bureaucrats adjust their demands according to firms' ability to pay bribes (Svensson 2003). In such firms, managers may decide to use corporate cash holdings as payment and to finance capital projects, encourage favorable treatment, gain access to public services, and mitigate predatory behavior (Claessens et al. 2008; Kim et al. 1998; Opler et al. 1999; Smith 2016; Tahoun 2014; Wei and Kaufmann 1999; Xu et al. 2017). Cash can be a justifiable means of increasing CAPEX under both the GAAP and IFRS guidelines in the US as long as management can prove that it is used to meet its intended purpose. In the US, if firms accumulate cash to operate in corrupt business environments, CAPEX will increase. Therefore, I present the following hypothesis in the alternative form:

Hypothesis: Collusive public corruption through misuse of corporate cash holdings increases CAPEX.

2. Methodology

In this section, I discuss the methodology employed in this study, including the sample selection process, research design, and variable measurement.

2.1 Sample Selection

Table 1 describes the sample selection process starting with all firms with headquarters located in the US, as recorded by Compustat, for the years 1976–2019. This study excludes firms without the necessary financial data related to CAPEX, cash and short-term investments, debts, and equity issuance. Also excluded are firms without state-level public corruption data. This study follows the protocol in the literature that eliminates firms in financial and regulated industries (Standard Industrial Classification (SIC) codes 6000-6999 and 4900-4999). Lastly, all regression variables are winsorized at the 1% and 99% levels. Thus, the sample consists of 193 503 firm-year observations.

Table 1. Sample selection process

Description	Observations
Total firms from 1980 to 2019	339 400
Less: Those for which no necessary data regarding financial variables are available	(76 634)
Less: Those for which no corruption data exists	(22 164)
Less: Firms belonging to financial industries (SIC 6000-6999)	(32 632)
Less: Firms belonging to regulated industries (SIC 4900-4999)	(14 467)
Final Sample, All Observations	193 503

2.2 Empirical Model

This study analyzes the impact of collusive public corruption on CAPEX using the weighted least squares regression model (1), as shown below.

$$\text{CAPEX}_{it} = \beta_0 + \beta_1 \text{PUBLIC CORRUPTION} * \text{CASH}_{it} + \beta_2 \text{PUBLIC CORRUPTION}_{it} + \beta_3 \text{CASH}_{it} + \text{Control variables Industry fixed effects}_{it} + \text{State fixed effects}_{it} + \text{Year fixed effects}_{it} + \varepsilon_{it} \quad (1)$$

The weighted least squares regression model weighs each state equally such that firm-year observations receive greater (less) weight in states with fewer (more) firm-years to ensure that the results are not driven by states with the highest numbers of firm-year observations (Moshirian et al. 2017). See Appendix B for the definitions of variables.

2.3 Measures

In the regression, i indicates firms, t indicates year, and CAPEX represents capital expenditures for firm i in year t scaled by a common scale factor, total assets at the beginning of year t (Brown and Petersen 2009). PUBLIC CORRUPTION is the time-series average of the rate of state-level public corruption (STATE CORRUPTION) for every 100 000 people in the state population in year t (Ellis et al. 2020; Glaeser and Saks 2006). An array of control variables is included that are known to affect CAPEX and PUBLIC CORRUPTION following the protocol in prior studies (Chen and Chen 2013; Dass et al. 2016; Ellis et al. 2020; Moshirian et al. 2017; Tran 2020). The measure of CASH is total cash and short-term investment divided by total assets in year t. The measure of cash flow, S, is the sum of income before extraordinary items and depreciation in year t scaled by total assets at the beginning of period t. D is the change in total debts from year t to year t-1, and E is net equity (both common stocks and preferred stocks) issued in year t. Both D and E are scaled by a common scale factor, total assets at the beginning of period t. DE_INC is an indicator variable that equals one if the firm is incorporated in Delaware and 0 otherwise. LEV is long-term debt divided by total assets at the beginning of year t. SIZE is the natural logarithm of total sales in year t, and ROA is earnings before extraordinary items divided by total assets in year t. PC represents cash and short-term investments in the previous year divided by total assets in year t-1, and PI is capital expenditures divided by total assets in year t-1. AD is advertising expenses divided by sales in year t, and SGP is the difference between net sales in year t and net sales in year t-1 divided by net sales in year t-1. CNW refers to the change in net working capital (current assets minus current liabilities, and cash and short-term investment) between the year t and the year t-1. CSD is short-term debt divided by total assets in year t minus short-term debt divided by total assets in year t-1. FAGE is the natural logarithm of the number of years the firm has been listed in Compustat, and PQ is the lagged Tobin's Q (market value of equity minus total equity plus total assets divided by total assets in year t). SA represents the likelihood of financial constraints; higher values for SA are associated with a greater likelihood of financial constraints. CAGE is the number of years from the first year of state constitutions until the last year of the sample period, and VOTE is the number of days an individual is required to be a state resident to be able to vote. GG is annual GDP growth, and GDP is the natural logarithm of annual GDP in each state during the sample period. The model includes industry fixed effects based on the Fama-French classification of 48 industries, with standard errors clustered at the state level. Firms are nested within states; this is a more conservative way to account for correlation in the standard errors across firms within states (Cameron and Miller 2015; Ellis et al. 2020). Lastly, year fixed effects are included.

3. Results and Discussion

3.1 Descriptive Statistics

Table 2 presents summary statistics for the variables used in the empirical analysis. The mean value for CAPEX is 0.08 (range: 0 to 0.88, suggesting that CAPEX can vary substantially by industry or firm characteristics. In the second row of Table 2, the value for the time-series of STATE CORRUPTION is 0.26 (range: 0.09 to 0.42),

indicating heterogeneity of statewide corruption convictions over the sample period.

Table 2. Descriptive statistics (N = 193 503)

Variable	Mean	Median	25th %ile	75th %ile	SD	Minimum	Maximum
CAPEX	0.08	0.04	0.02	0.09	0.13	0.00	0.88
STATE CORRUPTION	0.26	0.25	0.20	0.35	0.09	0.09	0.42
DISTRICT CORRUPTION	0.28	0.25	0.19	0.32	0.16	0.08	0.94
CASH	0.19	0.09	0.02	0.26	0.23	0.00	0.95
S	-0.23	0.03	-0.10	0.09	1.21	-9.70	0.62
D	0.02	0.00	0.00	0.00	0.73	-3.98	5.34
E	-0.19	0.00	-0.01	0.00	0.81	-6.26	0.17
DE_INC	0.00	0.00	0.00	0.00	0.06	0.00	1.00
SIZE	0.88	0.57	0.36	0.81	1.68	0.03	14.36
SIZE	4.33	4.49	2.57	6.27	2.72	-2.78	10.13
ROA	-0.23	0.02	-0.10	0.07	1.04	-8.27	0.29
MTB	4.24	1.92	1.28	3.23	10.16	0.00	83.46
PC	0.19	0.09	0.02	0.26	0.23	0.00	0.96
PI	0.08	0.04	0.01	0.09	0.12	0.00	0.82
AD	0.01	0.00	0.00	0.01	0.03	0.00	0.23
SGP	25.53	7.85	-2.48	24.69	93.36	-93.49	707.59
CNW	-0.03	0.00	-0.05	0.04	0.46	-3.30	1.79
CSD	0.03	0.00	-0.04	0.04	0.46	-1.85	3.34
FAGE	3.22	3.58	3.26	3.83	1.14	0.00	4.08
PQ	2.70	1.62	1.15	2.52	5.06	0.00	41.60
SA	-2.74	-3.48	-4.38	-0.98	2.12	-5.48	1.00
CAGE	111.71	139.00	48.00	144.00	62.61	1.00	239.00
GG	23.32	28.00	15.00	29.00	8.02	0.00	30.00
GDP	0.06	0.06	0.06	0.07	0.01	0.05	0.08

3.2 Public Corruption and Capital Expenditures

Table 3 presents the results of the regression analysis for testing of the hypothesis regarding the relationship between STATE CORRUPTION*CASH and CAPEX. In Column 1, note that the coefficient for STATE CORRUPTION is negative and significant on CAPEX at the 1% level (-0.053, t = -4.850), suggesting that CAPEX is lower in firms located in states with greater public corruption. In Column 2, there is a negative and significant relationship at the 1% level (-0.112; t = -11.690) between CASH and CAPEX, indicating that internal funding sources, such as cash holdings, are negatively related with CAPEX. When both STATE CORRUPTION and CASH are included in the same model, as shown in Column 3, the significant and negative relationship between these variables remains strong (-0.050, t = -3.630; -0.109, t = -12.250). Lastly, in Column 4, the coefficient on the interaction between STATE CORRUPTION and CASH is positive and significant at the 1% level (0.057, t = 2.970), and the coefficient of STATE CORRUPTION and CASH remains negative and significant (-0.032, t = -2.860; -0.126, t = -14.170). The positive and significant coefficient on the interaction term of STATE CORRUPTION and CASH suggests that firms operating in more corrupt states may easily build up pay-to-play relationships with bureaucrats using internal source funding, such as cash holdings, in the process of executing capital projects. In the analysis of public corruption at the district level in association with corporate cash holdings, the results are qualitatively similar, indicating that managers may exercise their discretion to transform cash into specific assets, rationalizing cash transfers to bureaucrats by classifying them as CAPEX.

Table 3. Collusive public corruption and capital expenditures

Variable	Dependent variable: CAPEX							
	(1)		(2)		(3)		(4)	
STATE CORRUPTION*CASH							0.06	***
							(2.97)	
STATE CORRUPTION	-0.05	***			-0.05	***	-0.03	***
	(-4.85)				(-3.63)		(-2.86)	
CASH			-0.11	***	-0.11	***	-0.13	***
			(-11.69)		(-12.25)		(-14.17)	
S	-0.01	**	-0.01	**	-0.01	**	-0.01	**
	(-2.36)		(-2.12)		(-2.56)		(-2.12)	
D	0.00		0.00		0.00		0.00	
	(0.89)		(1.12)		(0.99)		(1.13)	
E	-0.03	***	-0.04	***	-0.03	***	-0.04	***
	(-12.87)		(-13.29)		(-13.53)		(-13.29)	
DE_INC	0.02	***	0.02	***	0.02	***	0.02	***
	(3.51)		(3.23)		(3.5)		(3.27)	
LEV	0.01	***	0.01	***	0.01	***	0.01	***
	(11.87)		(12.19)		(11.97)		(12.18)	
SIZE	0.00		0.00		0.00		0.00	
	(-0.62)		(-1.3)		(-1.57)		(-1.27)	
ROA	0.02	***	0.02	***	0.02	***	0.02	***
	(16.59)		(16.71)		(17.35)		(16.66)	
MTB	0.00	***	0.00	***	0.00	***	0.00	***
	(14.94)		(14.53)		(15.57)		(14.55)	
PC	0.01	**	0.09	***	0.09	***	0.09	***
	(2.23)		(10.19)		(10.53)		(10.23)	
PI	0.34	***	0.33	***	0.33	***	0.33	***
	(31.48)		(30.99)		(28.12)		(30.9)	
AD	0.03	**	0.03	**	0.03	***	0.03	**
	(2.53)		(2.27)		(3.05)		(2.29)	
SGP	0.00	***	0.00	***	0.00	***	0.00	
	(11.05)		(10.99)		(11.35)		(11.01)	***
CNW	-0.06	***	-0.12	***	-0.11	***	-0.12	***
	(-10.41)		(-17.07)		(-17.62)		(-17.08)	
CSD	-0.06	***	-0.12	***	-0.12	***	-0.12	***
	(-9.49)		(-15.52)		(-15.79)		(-15.52)	
FAGE	-0.01	***	-0.01	***	-0.01	***	-0.01	***
	(-3.8)		(-3.67)		(-3.78)		(-3.67)	
PQ	0.00	***	0.00	***	0.00	***	0.00	***
	(-19.22)		(-21.72)		(-23.73)		(-21.74)	

SA	0.00	***	0.00	***	0.00	***	0.00	***
	(-3.68)		(-3.84)		(-4.07)		(-3.84)	
CAGE	0.00	***	0.00	***	0.00	***	0.00	***
	(2.69)		(4.59)		(3.6)		(3.43)	
VOTE	0.00	***	0.00	***	0.00	***	0.00	***
	(5.46)		(4.71)		(4.66)		(5.59)	
GG	-0.55	***	0.31	*	-0.39	**	0.00	
	(-8.17)		(1.93)		(-2.24)		(-0.04)	
GDP	0.00		-0.01	***	0.00		-0.01	***
	(-0.56)		(-4.96)		(-0.76)		(-2.71	
Industry fixed effect	Included		Included		Included		Included	
State fixed effects	Included		Included		Included		Included	
Year fixed effects	Included		Included		Included		Included	
Adj-R^2	0.56		0.56		0.56		0.56	
N	193 503		193 503		193 503		193 503	

***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively, based on a two-tailed test. See Appendix B for variable definitions.

3.3 Robustness Checks: Alternative Measure of Public Corruption

In Table 4, the main test is repeated with an alternative measure of public corruption: the influence on CAPEX of the survey-based State Integrity Index and corporate cash holdings (CORRUPTION PERCEPTION*CASH). CORRUPTION PERCEPTION is ranked from 1 to 50 based on experienced journalists' assessment of the risk of public access to information, political financing, accountability (executive, legislative, and judicial), lobbying disclosures, and state pension funds management (the CORRUPTION PERCEPTION variable excludes the District of Columbia, Guam and Northern Mariana Islands, Puerto Rico, and the Virgin Islands from the assessment). The results are shown in Columns 1-4. In Column 1, the coefficient for the effect of CORRUPTION PERCEPTION on CAPEX is negative and significant at the 1% level (-0.00, t = -4.00), suggesting that CAPEX is lower in firms located in states where public corruption is perceived to be high. The results in Column 2 present evidence of a negative and significant relationship at the 1% level (-0.11, t=-11.44) between cash holdings (CASH) and CAPEX, indicating a negative relationship between internal funding sources, such as cash holdings, and CAPEX. When both CORRUPTION PERCEPTION and CASH are included in the same model, as shown in Column 3, the significant and negative relationship between these variables remains strong (-0.00, t = -4.00; -0.11, t = -11.44). Lastly, in Column 4, the coefficient on the interaction between CORRUPTION PERCEPTION and CASH is positive and significant at the 1% level (0.00, t = 4.47), whereas the coefficient of STATE CORRUPTION and CASH remains negative and significant (-0.00, t = -4.3; -0.12, t = -11.29). Thus, the hypothesis presented in this study is supported.

Table 4. Alternative measure of corruption: corruption perception

Variable	Dependent variable: CAPEX			
	(1)	(2)	(3)	(4)
CORRUPTION PERCEPTION *CASH				0.00 ***
				(4.47)
CORRUPTION PERCEPTION	0.00 ***		0.00 ***	0.00 ***
	(-4.00)		(-4.22)	(-4.43)
CASH		-0.11 ***	-0.11 ***	-0.12 ***
		(-11.44)	(-11.44)	(-11.29)
Control variables	Included	Included	Included	Included
Industry fixed effects	Included	Included	Included	Included
State fixed effects	Included	Included	Included	Included
Year fixed effects	Included	Included	Included	Included
Adj-R^2	0.55	0.56	0.56	0.56
N	193 503	193 503	193 503	193 503

***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively, based on a two-tailed test. See Appendix B for variable definitions.

3.4 Additional Analyses

3.4.1 Collusive Public Corruption and Capital Expenditures by Life Cycle Stage

Next, this study examines the relevance of the firm life cycle to collusive public corruption in relation to CAPEX. In Table 5, when firms are in the introduction, growth, or maturity stages (Columns 1, 2, and 3, respectively), the coefficient terms on the interaction between STATE CORRUPTION and CASH are positive and significant on CAPEX at the 5%, 1%, and 5% levels, respectively (0.111, t = 2.53; 0.12, t = 2.88; 0.05, t = 2.03, respectively), whereas the coefficient terms on STATE CORRUPTION and CASH in relation to CAPEX are not significant for firms in the shake-out or decline stages (Columns 4 and 5). These results support the idea that firms that are ready to sell marketable products based on innovation are vulnerable to public corruption as they expand their production capacity. For example, firms in the early stage may interact with bureaucrats to acquire operating licenses, inspections, permits, and various environmental approvals to support their innovative activities (Murphy et al. 1993). Such interactions increase the possibility of collusive public corruption influencing the process of facilitating entrepreneurial activities as capital projects are pursued to maximize growth (Dass et al. 2016; Ellis et al. 2020). In contrast, established firms in the shake-out or declining stages already have connections with politicians; they may leverage these connections to change existing regulations and promote sharing of government-related costs among interest groups through legal lobbying activities. Thus, firms in the shake-out or decline stages are less likely to be involved in pay-to-play relationships or to misuse internal sources of financing such as corporate cash holdings. Taken together, the results indicate that CAPEX is more likely to increase in firms in the introduction, growth, or maturity stages because siphoning cash to CAPEX with bribery in mind facilitates operations in corrupt local business environments.

Table 5. Collusive public corruption and capital expenditures by life cycle stage

Variable	Dependent variable: CAPEX									
	(1) Introduction		(2) Growth		(3) Maturity		(4) Shake-out		(5) Decline	
STATE CORRUPTION*CASH	0.11	**	0.12	***	0.05	**	-0.05		0.02	
	(2.53)		(2.88)		(2.03)		(-1.5)		(0.77)	
STATE CORRUPTION	-0.32	***	3.43	**	-0.11	***	-0.06		0.20	***
	(-8.78)		(2.08)		(-7.31)		(-0.06)		(11.8)	
CASH	-0.13	***	-0.17	***	-0.13	***	-0.18	***	-0.02	***
	(-11.42)		(-11.86)		(-13.29)		(-13.71)		(-3.77)	
Control variables	Included		Included		Included		Included		Included	
Industry fixed effects	Included		Included		Included		Included		Included	
State fixed effects	Included		Included		Included		Included		Included	
Year fixed effects	Included		Included		Included		Included		Included	
Adj-R^2	0.55		0.68		0.71		0.59		0.26	
N	32,163		38,047		51,153		56,404		15,736	

***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively, based on a two-tailed test. All variables are described in appendix B.

3.4.2 Collusive Public Corruption and Capital Expenditures by Region

The next analysis examines how the STATE CORRUPTION*CASH variable influences CAPEX based on cross-sectional regional variations. As shown in Table 6, for firms located in the Midwest region (Column 2), the coefficient term on the interaction between STATE CORRUPTION and CASH is positive and significant on CAPEX (0.05, t = 2.37) at the 5% level, whereas in firms located in the West region (Column 4), the coefficient term on STATE CORRUPTION and CASH in relation to CAPEX is negative and significant at the 1% level (-0.07, t = -3.93). There is no significant relationship between collusive public corruption and capital expenditures in the Northeast or South regions (Columns 1 and 3, respectively). These results reveal that regional characteristics have an impact on the relationship between collusive public corruption and capital expenditures.

Historically, the productivity of firms located in the Midwest region gradually declined from 1973 to 2007 because of recursive technological advancement and systematic withdrawal of institutional, state, and financial investment compared to those in the West region; these changes prompted the collapse of the regional economy (McQuarrie 2017). A positive relationship between collusive public corruption and CAPEX is therefore more likely for Midwest firms with less competitive advantage. This is because such firms opt to increase CAPEX to sustain their pay-to-play relationships with bureaucrats to maintain regional wealth. When collusive public corruption increases CAPEX, devaluation of these firms prevents new manufacturing agglomerations, which hinders growth of the regional economy.

Table 6. Collusive public corruption and capital expenditures by region

Variable	Dependent variable: CAPEX							
	(1) Northeast		(2) Midwest		(3) South		(4) West	
STATE CORRUPTION*CASH	0.08		0.05	**	0.01		-0.07	***
	(1.12)		(2.37)		(0.27)		(-3.93)	
STATE CORRUPTION	-0.65	***	-0.18	***	-0.03		0.03	
	(-8.95)		(-10.36)		(-0.92)		(1.11)	
CASH	-0.12	***	-0.14	***	-0.12	***	-0.10	***
	(-5.1)		(-25.97)		(-4.67)		(-5.73)	
Control variables	Included		Included		Included		Included	
Industry fixed effects	Included		Included		Included		Included	
State fixed effects	Included		Included		Included		Included	
Year fixed effects	Included		Included		Included		Included	
Adj-R^2	0.52		0.61		0.59		0.54	
N	50,540		35,226		57,387		50,350	

***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively, based on a two-tailed test. All variables are described in appendix B.

4. Conclusion

This paper makes several contributions. Using the number of actual public corruption convictions in the US, this study reveals the pervasive and persistent impact of corrupt business environments on firms operating in such environments. Firms can elect to involve themselves in pay-to-play relationships, using corporate cash holdings to take advantage of capitalizing processes, address specific costs, or expand assets. Such behind-the-scenes actions are not legally addressable, at least in terms of accounting treatment, because laws regarding capital expenditure treatments using either the rule-based US-GAAP (ASC 360) or the principle-based IFRS (IAS 16) are similarly vague. They fail to define clearly how cash payments for CAPEX are necessarily incurred expenses to obtain permits or licenses from bureaucrats.

Furthermore, this study provides additional insight into the results of prior studies on public corruption, which indicated that firms in the early stages of the corporate life cycle are susceptible to collusive public corruption in relation to CAPEX. For example, past capital investment failure in the US Rust Belt demonstrated the impact of huge capital investment without regional technological evolution. In this region, already marginal productivity was reduced and the Midwest regional economy deteriorated further.

Lastly, unless the collusive public corruption between governments and firms in relation to the discretionary treatment of CAPEX is carefully addressed by both domestic and international policy makers, capital investment will remain less than optimal; this, in turn, will result in further curtailment of investment in innovation and economic growth, and regional, national, and global economies will be impacted negatively. This will ultimately hurt capital market participants in both domestic and global financial markets.

The results of this study are subject to data limitations in that US data on public corruption is not directly linked to specific firms or executives. Nonetheless, this paper is an initial step towards understanding the pervasive effects of public corruption in relation to bureaucrats who have power and discretion over corporate activities. Future research may increase our understanding of the effects of public corruption on accounting treatments from a risk management perspective, particularly in the oil and gas industry (Guo 2020).

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Appendix A

Capital Expenditure Disclosures on 10-K

ISRG (Intuitive Surgical) 10-K 2021

Our business is not capital equipment-intensive. However, with the growth of our business and our investments in property and facilities and in manufacturing automation, capital investments in these areas have increased. We expect these capital investments to increase significantly in 2022 to a range between $700 million and $1 billion. A significant portion of this investment involves construction of facilities to provide incremental space for growth, to consolidate operations to enhance efficiency, and to replace leased spaces with owned spaces. These capital investments also expand our OUS footprint in support of opportunities for growth in key international markets. We intend to fund these capital investments with cash generated from operations.

Source: SEC (2021a).

GM (General Motors Co.) 10-K 2021

The COVID-19 pandemic and its impact on the global economy may disrupt our business and operations, which could materially adversely impact our business, financial condition, liquidity, and results of operations. Capital expenditures and payments for engineering and product development activities. Our ability to meet these cash requirements may be negatively impacted by the ongoing COVID-19 pandemic.

Source: SEC (2021b).

Tesla (TSLA) 10-K 2021

Gigafactory Shanghai—Land Use Rights and Economic Benefits

We have an agreement with the local government of Shanghai for land use rights at Gigafactory Shanghai. Under the terms of the arrangement, we are required to meet a cumulative capital expenditure target and an annual tax revenue target starting at the end of 2023. In addition, the Shanghai government has granted to our Gigafactory Shanghai subsidiary certain incentives to be used in connection with eligible capital investments at Gigafactory Shanghai. These incentives offset the related costs of our facilities in our consolidated financial statements included elsewhere in this Annual Report on Form 10-K. Finally, the Shanghai government granted a beneficial corporate income tax rate of 15% to certain eligible enterprises, which is lower than the 25% statutory corporate income tax rate in China. Our Gigafactory Shanghai subsidiary was granted this lower rate for 2019 through 2023. This lower tax rate reduces the income tax provision in our consolidated financial statements included elsewhere in this Annual Report on Form 10-K. Capital expenditures amounted to $6.48 billion during 2021, compared to $3.16 billion during 2020. Sustained growth has allowed our business to generally fund itself, but we will continue investing in a number of capital-intensive projects in upcoming periods.

We are likely to see heightened levels of capital expenditures during certain periods depending on the specific pace of our capital-intensive projects and rising material prices and increasing supply chain and labor expenses resulting from changes in global trade conditions and labor availability associated with the COVID-19 pandemic.

As discussed in and subject to the considerations referenced in Part II, Item 7, Management's Discussion and Analysis of Financial Condition and Results of Operations—Management Opportunities, Challenges and Risks and 2022 Outlook—Cash Flow and Capital Expenditure Trends in this Annual Report on Form 10-K, we currently expect our capital expenditures to support our projects globally to be between $5.00 to $7.00 billion in 2022 and each of the next two fiscal years. In connection with our operations at Gigafactory New York, we have an agreement to spend or incur $5.00 billion in combined capital, operational expenses, costs of goods sold and other costs in the State of New York through December 31, 2029 (pursuant to a deferral of our required timelines to meet such obligations that was granted in April 2021 and which was memorialized in an amendment to our agreement with the SUNY Foundation in August 2021). We also have an operating lease arrangement with the local government of Shanghai pursuant to which we are required to spend RMB 14.08 billion in capital expenditures at Gigafactory Shanghai by the end of 2023. For details regarding these obligations, refer to Note 15, Commitments and Contingencies, to the consolidated financial statements included elsewhere in this Annual Report on Form 10-K.

Note 15 – Commitments and Contingencies

Operating Lease Arrangement in Shanghai, China

We have an operating lease arrangement for an initial term of 50 years with the local government of Shanghai for land use rights where we are constructing Gigafactory Shanghai. Under the terms of the arrangement, we are

required to spend RMB 14.08 billion in capital expenditures by the end of 2023 and to generate RMB 2.23 billion of annual tax revenues starting at the end of 2023. If we are unwilling or unable to meet such target or obtain periodic project approvals, in accordance with the Chinese government's standard terms for such arrangements, we would be required to revert the site to the local government and receive compensation for the remaining value of the land lease, buildings and fixtures. We expect to meet the capital expenditure and tax revenue requirements based on our current level of spend and sales.

Source: SEC (2021c).

Appendix B

Variable Definitions

Variable	Description
CAPEX	capital expenditures divided by total assets at the beginning of year t.
STATE CORRUPTION	time-series average of state-level corruption convictions for every 100 000 people in the population.
DISTRICT CORRUPTION	time-series average of district-level corruption convictions for every 100 000 people in the population.
CORRUPTION PERCEPTION	survey-based state integrity perception of journalists on state-level corruption risk. Higher rank indicates greater corruption. The data is publicly available at https://publicintegrity.org/state-politics/state-integrity-investigation/how-does-your-state-rank-for-integrity/
CASH	cash and short-term investments in the previous year divided by total assets in year t.
S	income before extraordinary items and depreciation divided by total assets at the beginning of year t.
D	total debts minus previous year total debts divided by total assets at the beginning of year t.
E	total equity issued measured as purchase of common and preferred stocks minus sale of common and preferred stocks divided by total assets at the beginning of year t.
DE_INC	an indicator variable that equals 1 if the firm is incorporated in Delaware and 0 otherwise.
LEV	long-term debt divided by total assets at the beginning of year t.
SIZE	natural logarithm of sales in year t.
ROA	ratio of earnings and income before extraordinary items to assets in year t.
MTB	ratio of book assets minus common equity plus market value of equity to book assets at total assets at the beginning of year t.
PC	cash and short-term investments in the previous year divided by total assets in year t-1.
PI	capital expenditures divided by total assets in year t-1.
AD	advertising expenses divided by sales in year t.
SGP	sales growth rate (sales in current year-sales in previous year)*100.
CNW	changes in net working capital to assets in year t to year t-1.
CSD	changes in current liabilities to assets in year t to year t-1.
FAGE	log of the number of years the firm has been on Compustat with a non-missing stock price.
PQ	Tobin's Q (ratio of the market value of equity minus the book value of equity plus total assets to total assets) in year t-1.
SA	-0.737(natural logarithm of total assets) +0.043(natural logarithm of total assets) 2-0.040(firm age), a measure of financial constraint; firms with higher SA values are more likely to be constrained.

CAGE	number of years from the beginning of state constitutions until December 31, 2019.
VOTE	number of days an individual must be a state resident to be able to vote.
GG	annual GDP growth from 1976 to 2019.
GDP	log value of annual GDP from 1976 to 2019.
FIRM LIFE CYCLE STAGE	Three net cash flow activities (operating, investing, and financing) can have a positive or negative sign, resulting in 8 possible combinations. The eight patterns are collapsed into five firm life cycles as shown below:
1) Introduction	If predicted signs of operating cash flow activities and investing activities are negative, whereas the predicted sign of financing activities is positive, then the firm is in the introduction stage.
2) Growth	If predicted signs of operating cash flow activities and financing activities are positive, whereas the predicted sign of investing activities is negative, the firm is in the growth stage.
3) Mature	If the predicted sign of operating cash flow activities is positive, whereas the predicted signs of investing activities and financing activities are negative, the firm is in the mature stage.
4) Shake-out	The firm is in shake-out stage under either of the following two conditions: 1) When the predicted signs of all cash flow activities (operating, investing, and financing) are either negative or positive; 2) When the predicted signs of operating and investing cash flows are positive, whereas the predicted sign of financing activities is negative.
5) Decline	The firm is in the decline stage under either of the following two conditions: 1) When the predicted sign of operating activities is negative, whereas the predicted signs of investing and financing activities are positive; 2) When the predicted signs of operating and financing activities are negative, whereas the predicted sign of investing is positive.
REGIONS	Four US regions depending on geographic positioning according to the Census Bureau classification system: Northeast, Midwest, South, and West.
1) Northeast	Northeast includes states belong to New England (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont) and the Middle Atlantic region (New Jersey, New York, and Pennsylvania).
2) Midwest	Midwest includes states belong to the East North Central (Indiana, Illinois, Michigan, Ohio, and Wisconsin) and West North Central (Iowa, Nebraska, Kansas, North Dakota, Minnesota, South Dakota, and Missouri) regions.
3) South	South includes states belong to the South Atlantic (Delaware, Washington D.C., Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, and West Virginia), East South Central (Alabama, Kentucky, Mississippi, Tennessee), and West South Central (Arkansas, Louisiana, Oklahoma, and Texas) regions.
4) West	West includes states belong to the Mountain (Arizona, Colorado, Idaho, New Mexico, Montana, Utah, Nevada, and Wyoming) and Pacific (Alaska, California, Hawaii, Oregon, and Washington) regions.