Eat, Drink, Firms, Government: An Investigation of Corruption from the Entertainment and Travel Costs of Chinese Firms

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We propose entertainment and travel costs (ETC) expenditures as a measure of corruption in Chinese firms. These expenses are publicly reported in firms' accounting books, and on average they amount to about 3 percent of a firm's total value added. We find that ETC is a mix that includes grease money to obtain better government services, protection money to lower tax rates, managerial excesses, and normal business expenditures to build relational capital with suppliers and clients. Entertainment and travel costs overall have a significantly negative effect on firm productivity, but we also find that some components of ETC have substantial positive returns to firms.

1. Introduction

Corruption is one of the central issues in developing and transitional economies. Indeed, the Copenhagen Consensus identified "governance and corruption" as a global priority (Rose-Ackerman 2004). At least two crucial conditions need to

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be met to curb corruption effectively: first, we must have effective methods to detect corruption, and second, we must know the institutional determinants of corruption. Yet, because of its illicit nature, corruption is notoriously difficult to detect with objective data. As a result, most of the existing literature on corruption relies either on microlevel subjective surveys or country-specific corruption perception indices.[1] However, it is well known that subjective survey data can suffer from a number of biases (Bertrand and Mullainathan 2001).

Recent literature proposes auditing or experimental approaches to identify evidence of corruption (Olken 2006, 2007; Bertrand et al. 2007). While such objective measures of corruption are desirable, it is often costly to audit all public projects, and the very act of auditing may affect the degree of corruption. Moreover, corruption can occur in many situations in which an objective assessment is impossible. In such cases, researchers attempt to rely on predictions from economic models for indirect evidence of corruption.[2]

While finding reliable and objective, albeit indirect, evidence of corruption is important, from a public policy viewpoint, it is equally critical to understand the institutional causes and economic consequences of corruption. Of course, corruption results from weak institutions, but, as argued in Acemoglu and Johnson (2005), not all weak institutions are alike. Because of data limitations, empirical work has shed little light on the more detailed institutional causes of corruption. Moreover, most of the existing empirical research on the effect of corruption typically focuses on whether corrupt governments reduce the rates of economic growth at the macro level (Mauro 1995); there is no systematic evidence regarding the private return to bribing government officials at the firm level.[3]

In this paper, we propose entertainment and travel costs (ETC) expenditures as a measure of corruption in Chinese firms. Entertainment and travel costs are a standard expenditure item publicly reported in accounting books of Chinese firms, and on average ETC amounts to about 3 percent of a firm's total value added in our data set. Because ETC is taken directly from firms' accounting books, it is not subject to the biases associated with subjective survey data. Entertainment and travel costs are used to cover entertainment (including eating, drinking, gifts, karaoke, and sports club membership) and travel expenditures. In addition to legitimate business travel and other expenses, Chinese managers commonly use the ETC accounting category to reimburse expenditures used to bribe government officials, entertain clients and suppliers, or accommodate man-

[1] See Mauro (1995), Ades and Di Tella (1999), and Treisman (2000) for recent contributions and Bardhan (1997) for a literature review.

[2] For example, Duggan and Levitt (2002) examine corruption in Japanese sumo wrestling, Di Tella and Schargrodsky (2003) study corruption in hospital procurement in Buenos Aires, Khwaja and Mian (2005) examine corruption in Pakistan bank loans, and Hsieh and Moretti (2006) study corruption in Iraqi's oil-for-food program.

[3] An exception is Fisman and Svensson (2007), which uses self-reported bribery payments in firm-level survey data from Uganda and finds a strong negative effect of bribery payments on firm growth.

agerial excess.[4] Fake or inflated receipts are submitted for reimbursement of illegitimate expenses. While the central government is aware of such practices, proving that a particular expenditure is illegitimate is close to impossible because in China it is still the norm to do business transactions in cash. Some common business practices implicitly encourage corruption. For example, many hotels operate boutiques for expensive gifts, and those gifts can be invoiced as room charges, which would be classified as traveling costs under ETC.

In inferring the components of ETC from its total expenditure, the key empirical challenge is that ETC likely contains both legitimate business expenses and corruptive expenses. We rely on the predictions from a simple model of Chinese managers' behavior and use the indirect-inference approach to empirically investigate various institutional determinants in firms' bribery decisions. Specifically, the predictions from our model indicate that, ceteris paribus, if expropriation by local government (proxied by effective tax rates) is affected by bribery payments, total ETC will be higher for firms more prone to expropriation; similarly, if the quality of local government service affected by bribery payments, firms will bribe more in cities with a lower quality of government service. We also derive similar comparative statics predictions about how total ETC is affected by firms' relational capital with clients and suppliers and by firms' governance structure. We use these comparative statics predictions to identify components of ETC by examining how ETC responds to different environmental variables in our data set.

We find that ETC is a mix that includes "grease" money to obtain better government services, protection money to lower tax rates, managerial excesses, and normal business expenditures to build relational capital with suppliers and clients. These findings are further reinforced in our analysis of the effects of ETC on firm performance as measured by total factor productivity (TFP) and labor productivity. We find that ETC overall has a significantly negative effect on firm productivity, but we also find that some components of ETC have substantial positive returns to firms.

The remainder of this paper is structured as follows. In Section 2, we present a simple model to illustrate our identification strategy. Section 3 describes our data and presents descriptive statistics. In Section 4, we examine the determinants of total ETC expenditures. Section 5 investigates how ETC expenditures affect firm performance, and Section 6 concludes.

2. Identification Strategy

Here we describe a simple model of ETC spending by Chinese managers and use its predictions to distinguish different components of ETC. Consider a man-

[4] Such practices are well known among multinationals operating in China. See Goodman (2005) for a report on how such practices affect the multinationals' operations in China. They are also observed in many other emerging economies (Bodrock 2005).

ager who decides the amount of firm funds to spend in four categories. The first category is normal business expenditures, denoted x_r, to build relational capital with suppliers and clients. This amount, among other things, includes travel expenses to meet suppliers and clients. The second category is managerial excess, denoted x_c, that goes directly to the manager's own pocket or to his or her family and friends. The third category is grease money, denoted x_g, which refers to bribes paid to service-related government agencies, such as licensing and utilities, in exchange for better government services. The fourth category is protection money, denoted x_p, which refers to bribes to government tax agencies' officials in exchange for lower government expropriation. For simplicity, we assume that the firm's performance is given by

$$\pi = a_0 + \alpha_g \ln(K_g) + \alpha_r \ln(K_r) - \alpha_p \ln(K_p) - x_r - x_c - (x_g + x_p), \quad (1)$$

where K_g is the quality of service that a firm receives from the government, K_r is the firm's relational capital with its suppliers and clients, K_p is the governmental expropriation that the firm faces, and a_0 and a_g, a_r, and a_p are nonnegative parameters. Thus, the firm's performance improves if it obtains better quality government services, has better relationships with its suppliers and clients, or faces less government expropriation.[5]

Suppose that K_g, K_r, and K_p are related to the ETC components x_g, x_r, and x_p as follows:

$$K_g = K_g^0 + a_g x_g, \quad (2)$$

$$K_r = K_r^0 + a_r x_r, \quad (3)$$

$$K_p = K_p^0 - a_p x_p, \quad (4)$$

where K_g^0 is the baseline quality of service from the government with no additional grease money, K_r^0 is the baseline level of the firm's relational capital with its suppliers and clients without any additional relational investment, K_p^0 is the baseline government expropriation in the absence of any additional protection money bribes, and a_g, a_r, and a_p are nonnegative parameters. The interpretation of these equations, taking equation (2) as an example, is as follows. The actual quality of government service that the firm receives depends on both the baseline quality K_g^0, which reflects the general attitude of the government toward business and the existing relationship of the particular firm with the government, and the grease money x_g that the firm invests in exchange for better government services. The parameter a_g measures the effectiveness of the grease money.

The manager's problem is to choose $[x_c^\star, x_r^\star, x_g^\star, x_p^\star]$ to maximize

[5] In specification (1), the contributions of the conventional production factors (capital and labor) to firm profits are summarized by the parameter a_0. See Cai, Fang, and Xu (2005) for more general specifications of the model and discussions of the six implications below.

$$U(x_c, x_r, x_g, x_p) = \ln(x_c) + \lambda\pi, \tag{5}$$

where $\ln(x_c)$ is the manager's utility from self-consumption and $\lambda\pi$ represents how much his or her incentives are aligned with maximizing the firm's performance. The parameter λ measures the congruity of managerial incentives with the firm owners' incentives.

Now we are ready to use this simple model to describe our identification strategy. It can be shown that the manager's optimal expenditure decisions are the following:

$$\begin{aligned} x_g^* &= \max\{\alpha_g - K_g^0/a_g, 0\}, \quad x_r^* = \max\{\alpha_r - K_r^0/a_r, 0\}, \\ x_p^* &= \max\{K_p^0/a_p - \alpha_p, 0\}, \quad x_c^* = 1/\lambda. \end{aligned} \tag{6}$$

In our data, we observe the total amount of ETC spent by firms, that is, ETC $= x_g^* + x_r^* + x_p^* + x_c^*$, and some proxies for K_g^0, K_r^0, K_p^0, and λ, which are described in Section 3.2. The key for our identification strategy is the realization that the baseline environment variables K_g^0, K_r^0, and K_p^0 affect ETC and firm performance π in divergent ways. For example, if the quality of the government's baseline service is low, that is, low K_g^0, then we expect to see higher ETC but worse firm performance. The following comparative statics results follow directly from equations (6).

Implication 1. If ETC is spent as grease money ($x_g^* > 0$), then it should be decreasing in the baseline level of government service K_g^0; otherwise, ETC should not be correlated with K_g^0.

Implication 2. If ETC is spent in building business relationships ($x_r^* > 0$), then it should be decreasing in the baseline level of relational capital with suppliers and clients K_r^0; otherwise, ETC should not be correlated with K_r^0.

Implication 3. If ETC is spent as protection money ($x_p^* > 0$), then it should be increasing in the baseline level of government expropriation K_p^0; otherwise, ETC should not be correlated with K_p^0.

Implication 4. If ETC is spent as managerial excess ($x_c^* > 0$), then it should be decreasing in the congruity of managerial incentives λ; otherwise, ETC should not be correlated with λ.

Our simple model also has implications regarding how ETC affects firm performance. From equations (1) and (5), the components of ETC, x_g, x_r, and x_p, are all investments chosen to maximize firm performance π; hence, ceteris paribus, a firm's performance may be positively correlated with these components of ETC. However, the managerial excess component of ETC, x_c, is completely unproductive for firm performance, which leads to a negative correlation between

firm performance and ETC. Therefore, whether ETC and firm performance on net are positively or negatively correlated is theoretically ambiguous.

Despite this ambiguity, we can still gain useful information about components of ETC from examining the marginal return of ETC to firm performance. To see this, take the grease money component, x_g, as an example. Suppose that ETC does not include a grease money component, that is, $x_g^* = 0$; then, from the first equation in (6) we know that ETC is independent of K_g^0, α_g, and a_g. Hence, a 1-unit change of ETC cannot be caused by changes in these parameters. Thus, the marginal return of ETC to firm performance should not be correlated with K_g^0. Suppose instead that ETC includes a grease money component, that is, $x_g^* > 0$. Suppose that changes of parameter values in K_g^0, α_g, and a_g lead to a 1-unit change in x_g^* and hence a 1-unit change in ETC (holding other parameters constant). We can show, using the envelope theorem, the following implications:

Implication 5. If ETC is spent as grease money ($x_g^* > 0$), then its marginal return to firm performance should be decreasing in the baseline level of government service K_g^0; otherwise, it should not be correlated with K_g^0.

Implication 6. If ETC is spent as protection money ($x_p^* > 0$), then its marginal return to firm performance should be increasing in the baseline level of government expropriation K_p^0; otherwise, it should not be correlated with K_p^0.

The intuition for this result is clear. When the baseline level of government service is lower, grease money spent in ETC will be more effective and thus will have greater marginal contributions to firm performance. Similarly, when the baseline government expropriation is high, protection money spent in ETC will be more effective. Our identification strategy is to learn about the components and thus the institutional determinants of ETC by testing these six implications.

3. Data and Measurements of Key Variables

3.1. Three Firm-Level Surveys

Our data come from three firm-level surveys conducted jointly by the World Bank and the Enterprise Survey Organization of the National Bureau of Statistics of China.[6]

The first survey was fielded during 2000–2002 and included 2,400 firms from 18 cities, representatively located across five regions of China. Either 100 or 150 firms were randomly sampled for each city from an electronic database of firms subject to the following constraints. First, firms were selected to ensure that both manufacturing and service industry firms were adequately represented. Second,

[6] Because firms are required by Chinese law to comply with surveys conducted by National Bureau of Statistics, the response rates were 100 percent for all three surveys.

only firms above a certain minimum size requirement (20 employees for manufacturing and 15 employees for service industries) were sampled.

The second survey was fielded during 2001–3 and included 1,070 firms located in all 15 major cities in Liaoning Province. Eighty firms were sampled in the cities of Shenyang and Dalian, the two largest cities in the province, and 70 firms were sampled in each of the remaining 13 cities.

The third survey was fielded in 2005 and included 12,400 firms located in 120 cities of all Chinese provinces except Tibet. In each province, the provincial capital, which is most often the most populous city, was automatically included, and additional cities were selected on the basis of the economic size of the province. One hundred firms were sampled in each city, except for the four megacities (Shanghai, Tianjin, Beijing, and Chongqing), where 200 firms were selected.

The three surveys include 15,870 firms located in 128 cities that are at very different stages of economic development.[7] Within this sample of cities, gross domestic product (GDP) per capita (in 2002 values) ranges from 3,600 yuan (about $430) in Chaoyang to 72,000 yuan (about $8,700) in Dongguan.

For the variables used in our analysis, the questionnaires for the three surveys are identical. They consist of two parts: the first is filled out by firms' senior managers and asks for qualitative information about the firm in the survey year, and the second covers financial and quantitative information, much of which goes back 3 years, about the firms' production and operation and is directly obtained from the firms' accounting books through the assistance of the firms' chief accountants.

3.2. Measurement of Key Variables

3.2.1. Measurement of ETC

The variable of central interest is ETC. We observe ETC for only 1 year for each firm in our sample. As a part of management expenses (*Guan Li Fei Yong* in Chinese), these expenditures are measured with little error because each reimbursement item in this category needs a receipt. The ETC is supposedly for the purpose of reimbursing normal businesses expenses. However, accounting practice in China is sufficiently lax that managers may be reimbursed for almost any kind of entertainment and travel for any purpose, often with fake or inflated receipts.

Entertainment and travel costs represent a significant portion of firms' expenditures. In our empirical analysis, we normalize ETC by total sales; ETC is the ratio of entertainment and travel costs to total sales. In our data, ETC has a median of .6 percent and a mean of 1.5 percent.[8] The value of ETC varies substantially across firms, with a sample standard deviation (SD) of 3.8 percent.

[7] See World Bank (2006) for more detailed discussions of these surveys.

[8] Less than .5 percent of the firms in our data have ETC of more than 100 percent. They are dropped as outliers from our analysis.

Table 1
Variations in Key Variables across Regions, Ownership Type, and Selected Industries

	ETC	Government Help	Tax Burden
By region:			
Inland	1.72	.382	.060
Coast	1.07	.408	.046
By ownership:			
State	1.65	.372	.062
Domestic private	1.59	.399	.055
Foreign	1.08	.403	.045
By industry:			
Agricultural products	.78	.444	.024
Petroleum	.48	.417	.058
Pharmaceutical	3.89	.357	.096
Ferrous metal	.46	.404	.047
General equipment	1.91	.353	.059
Electronics	1.43	.372	.049

Note. ETC is the mean ratio of entertainment and travel costs to total sales. Government Help is the city-industry median of the firm-level share of government officials who are helpful to the firm. Tax Burden is the city-industry median of the firm-level ratio of total tax to total sales in the previous year.

Across cities, the average firm ETC ranges from .3 percent in Dongguan, a coastal city and the richest in our sample, to 3.8 percent in Guiyang, an inland and relatively backward city.

The value of ETC also differs substantially for various types of firms. In Table 1, ETC is substantially higher in coastal areas than in inland areas. Domestic private firms and state-owned enterprises have similar levels of ETC, while foreign firms tend to have significantly lower ETC. Across industries, ETC seems to be significantly higher in more complex industries such as the pharmaceutical and equipment industries.

3.2.2. Measurement of K_g^0

Recall that K_g^0 is meant to capture the baseline quality of government service in the absence of additional bribes. We proxy K_g^0 for each firm in our data by the manager's answer to the following question: Among the government officials that your firm regularly interacts with, what is the percentage that tends to help the firm develop? The answer to this question reflects the firm's evaluation of the tendency of government officials to help them; hence, we call this variable Government Help. Government Help is a firm-specific measure of government helpfulness that depends on the overall government quality and the lagged relational capital each firm has with government officials. To avoid endogeneity, we use the city-industry median of firm-level observations of government help as the measure of the baseline level of government services. We allow the baseline

K_g^0 to differ by city-industry cells because there are vast regional variations in both development level and governance, and the need for government services tends to differ by industry.[9]

Table 1 also shows that government officials are more likely to be viewed as being helpful in coastal regions than in inland regions, and relative to domestic private and foreign firms, state-owned enterprises are less likely to say that government officials tend to be helpful.

3.2.3. Measurement of K_p^0

Recall that K_p^0 is the baseline government expropriation in the absence of any additional bribe to the government officials. For each firm we proxy K_p^0 by its total tax burden in the previous year, as measured by total taxes divided by total sales in that year. There is a substantial amount of across-firm variation in tax burdens. Tax rates differ across firm types (because of, for example, tax incentives to attract foreign investments) and across regions (because of, for example, negotiations between the central government and provinces or tax reductions for special economic zones). Moreover, tax law enforcement and collection efforts differ greatly across cities and firms within each city, so a firm's actual tax burden depends on the vigilance level of local tax officials and the firm's relationship with them. Again, to avoid endogeneity, we measure Tax Burden by the city-industry median of the firm-level total tax burden in the previous year.

The sample average of Tax Burden is 4.1 percent of sales, with an SD of 1.9 percentage points. The 10th percentile in the tax burden is 1.7 percent, and the 90th percentile is 6.5 percent. Table 1 shows that Tax Burden is lower in coastal regions than in inland regions. It is also highest for state-owned firms, followed by domestic private and foreign firms. It also varies greatly by industries.

3.2.4. Measurement of K_r^0

To measure a firm's baseline relational capital with its suppliers and clients K_r^0, we construct a variable called Years of Relationship, which is the sum of the years that the firm has known its most important supplier and the years that it has known its most important client. The two components of this variable are very closely correlated, and including them separately would lead to multicollinearity; thus, we bundle them as a single variable. Its sample mean is 11.8 years, and the sample SD is 5.7 years.

3.2.5. Other Variables

In our theoretical framework, the corporate governance and managerial incentive parameter λ affects a manager's ETC expenditure. However, the incentive structure for managers in Chinese firms is not at all transparent, and no good data are available on managerial incentives. We use Private Share, both domestic

[9] Since we also control for province (or other regional) and industry dummies, this city-industry tendency for government help is unlikely to be correlated with the error term at the firm level.

and foreign, to gauge how a manager's incentives are aligned with the firm's. Private owners are more motivated by profits and are thus likely to have stronger incentives to monitor managers' behavior. In our sample, the share of private ownership varies from 0 (purely state owned) to 1 (purely private), and the average firm in our sample has 38 percent private ownership, with an SD of 45 percent. The city averages of domestic private ownership vary from 78 percent in Wenzhou, a coastal city known for its private enterprises, to less than 2 percent in Dongguan; the city average of foreign ownership varies from 0 percent in Wuzhong and Tieling to 81 percent in Dongguan.

In addition to ownership, we also include in our empirical analysis basic firm characteristics such as the number of employees, firm age, and whether the firm sells to other provinces. Selling to other provinces also partly captures normal business expenditure because more cross-provincial traveling implies higher traveling costs. We capture regional characteristics by including city-level GDP per capita (in 2002 prices) and dummies for provinces and industries. Although all three surveys were implemented by the same survey team from the China National Bureau of Statistics along with the World Bank, we also include survey dummies to control for possible variation in enumerator quality and survey implementation. The survey dummies also function as controls for macrotrends because they are perfectly collinear with year dummies.

3.3. Summary Statistics

Table 2 provides definitions and statistics for the key variables.[10] Table 3 presents the raw correlations of ETC with some key variables in our analysis. It shows that overall ETC is lower in economic environments with better government services and lower tax burdens. The value of ETC is lower for firms that are more efficient, larger, and located in richer cities. It is lower in firms with more foreign ownership shares, stronger trading relationships, and higher salaries for chief executive officers (CEOs).

Table 3 also highlights one of the key advantages of using microdata to analyze corruption. In cross-country regressions using macrodata, there is often a very high correlation between corruption indices and other variables, such as GDP per capita. For example, the correlation between the International Country Risk Guide corruption indices (for about 100 countries between 1982 and 2001) and the countries' log GDP per capita (in constant U.S. dollars) is about −.60. This high multicollinearity makes any inference of the effect of corruption on economic performance difficult. In contrast, in our microdata, the correlation coefficient between log GDP per capita (in the city) and firms' ETC is only −.03.

[10] The last two variables in Table 2, Log CEO Pay and TFP, are described, respectively, in Sections 4.1 and 5.

Table 2
Definitions and Summary Statistics of Key Variables

Variable	Definition	Mean	SD
ETC	Ratio of entertainment and travel costs to total sales	.015	.038
Government Help	City-industry median of the firm-level share of government officials who are helpful to the firm	.316	.283
Lag Tax Burden	City-industry median of the firm-level ratio of total tax to total sales in the previous year	.041	.019
Log Years of Relationship	Logarithm of the number of years that the firm has known its main client plus the number of years that it has known its main supplier	2.352	.505
Log GDP per Capita	Logarithm of real gross domestic product per capita in a city	9.614	.614
Log Lagged Labor	Logarithm of the number of employees in the previous year	5.389	1.531
Log Firm Age	Logarithm of firm age	2.282	.804
Private Share	Share of domestic private ownership	.378	.449
Foreign Share	Share of foreign ownership	.122	.291
Sell to Firms in Other Provinces	Dummy variable indicating whether the firm sells to firms in other provinces	.738	.440
Log CEO Pay	Logarithm of chief executive officer pay	3.630	1.389
TFP	Levinsohn-Petrin estimate of total factor productivity	4.250	1.433

Note. $N \sim 15{,}000$ firms.

4. Composition of ETC

Here we examine the determinants of ETC using regression specifications suggested by our simple model in Section 2. The dependent variable is ETC, and the list of explanatory variables differs by specification. In Tables 4 and 5, we express ETC in percentage points because otherwise the coefficient estimates are too small to report. For each firm, we use the data from the last year in the relevant survey because ETC is observed only for that year.

Table 4 reports the ordinary least squares (OLS) regression results from two specifications, one with and one without dummies for industry, province, and survey. Both specifications include basic firm characteristics—Log Lagged Labor, Log Firm Age, and an indicator for whether it sells to other provinces—and controls for the city-level per capita GDP. The key focus is on the variables discussed above: Government Help (proxy for K_g^0), Lag Tax Burden (proxying K_p^0), Log Years of Relationship (proxying K_r^0), Private Share, and Foreign Share (proxy for managerial incentives). Recall that Government Help and Lag Tax Burden are constructed as the city-industry medians of firm-level reported values, while the other three variables are firm-level observations. Because some of our variables are measured at the group level (that is, city-industry specific), we calculate the standard errors of the estimates clustered at the city level to avoid overstating the precision of our estimation (Moulton 1990).

Our preferred specification, reported in column 2 of Table 4, shows that larger firms, as measured by the number of employees, have lower ETC. A 1 SD increase

Table 3
Correlation Coefficients of Entertainment and Travel Costs (ETC) with Key Variables

Variable	Coefficient	*p*-Value
Lag Tax Burden	.1264	.0000
Government Help	−.0528	.0000
Log Years of Relationship	−.0644	.0000
Sell to Firms in Other Provinces	−.0141	.0815
Log Labor Productivity	−.1562	.0000
TFP	−.2348	.0000
Log Firm Age	−.0191	.0182
Private Share	.0166	.0398
Foreign Share	.0564	.0000
Log GDP Per Capita	.0325	.0001
Log Lagged Labor	.1576	.0000
Log CEO Pay	.1006	.0000

in the logarithm of number of employees (1.53; see Table 2) reduces ETC by about .5 percentage point, which is a 33 percent reduction of the ETC sample mean (1.5 percentage points). This suggests that ETC exhibits strong economies of scale. There is also some evidence that older firms tend to spend more on ETC, although the estimate is only marginally significant. This suggests that ETC is not a once-and-for-all fixed cost in establishing relationships (with either officials or trading partners). It is also useful to note that the negative correlation between ETC and a city's GDP per capita in Table 3 does not survive in the regression framework.

In both specifications, the proxy for K_g^0, Government Help, has a statistically significant negative effect on ETC, consistent with the raw correlation reported in Table 3. The estimate in column 2 indicates that a 1 SD increase in Government Help lowers ETC by .11 percentage point (or 7 percent of the mean ETC). By implication 1, this suggests that part of ETC is spent to entertain or bribe government officials in exchange for a higher quality of government services, which thus provides support for the grease money view of corruption.

The proxy for baseline government expropriation K_p^0, Lag Tax Burden, has a strong and positive effect on ETC. This confirms the positive raw correlation between Lag Tax Burden and ETC shown in Table 3. Using the estimate from column 2, a 1 SD increase in this variable increases ETC by .13 percentage point (or 9 percent of the mean ETC). By implication 3, this suggests that part of ETC is spent as protection money bribes to government officials in exchange for lower expropriation.[11]

The variable Log Years of Relationship, which proxies for baseline relational capital with its suppliers and clients K_r^0, has no statistically robust relationship with ETC. Only when we do not control for industry, survey, and province dummies do we find a statistically significant and negative coefficient. This sug-

[11] We also tried clustering the standard errors at the city-industry level and obtained similar results.

Table 4
Determinants of Entertainment and Travel Costs (ETC)

Variable	(1)		(2)	
Government Help	−.358**	(.134)	−.396**	(.139)
Lag Tax Burden	18.491**	(2.646)	6.761**	(2.373)
Log Years of Relationship	−.159^{+}	(.085)	−.023	(.071)
Sell to Firms in Other Provinces	.329**	(.071)	.445**	(.076)
Private Share	−.167*	(.085)	−.061	(.067)
Foreign Share	−.165	(.104)	−.154	(.104)
Log Lagged Labor	−.360**	(.036)	−.305**	(.028)
Log GDP per Capita	.040	(.063)	−.042	(.072)
Log Firm Age	.095**	(.036)	.070^{+}	(.039)
Industry dummies	No		Yes	
Survey dummies	No		Yes	
Province dummies	No		Yes	
Adjusted R^2	.038		.082	

Note. The dependent variable is ETC in percentage points. Robust standard errors clustered at the city level are in parentheses. $N = 14{,}976$.
$^{+}$ Significant at the 10% level.
* Significant at the 5% level.
** Significant at the 1% level.

gests that the use of normal business expenditures as a way to build relationships with suppliers and clients is absorbed in the average industry and provincial ETC.[12] In contrast, we do find that firms that sell to other provinces tend to have higher values of ETC. Other things being equal, the ETC in firms that sell to other provinces is .4 percentage point higher than in firms that do not.

We use private and foreign share to proxy for corporate governance. Table 4 shows that Private Share and Foreign Share have a negative but statistically insignificant effect on ETC once we control for regional and industry dummies.[13]

It is useful to note that the results in column 2 are unlikely to be contaminated by the omission of geography or infrastructure variables. We have already controlled for province dummies (and city dummies in unreported results), which should capture most regional variation in geography and infrastructure.

4.1. Discussion and Robustness Checks

Our main results remain robust when we consider the possibility that an important determinant of firm ETC may be firm CEO pay. It is well known that Chinese firms pay their CEOs less than typical Western firms. Thus, part of the

[12] Some may argue that it may make more sense to separate the years of relationship with clients from those with suppliers. We tried that and found that the two variables are closely correlated, and the qualitative results are similar.

[13] We also tried replacing the continuous ownership variables with two dummy variables for domestic and foreign private ownership. Consistent with a common way of defining ownership, the domestic private dummy takes a value of one if the domestic private ownership surpasses 50 percent, and the foreign dummy takes a value of one if foreign ownership is positive. With the rest of the controls being the same as those in column 2, we find that both the domestic private and the foreign dummies are negative but insignificant.

firm ETC may function as a substitute for regulated CEO pay or as a tax-free income supplement to regular CEO salary. To evaluate this hypothesis, column 1 in Table 5 reports the regression results from a specification in which we include an additional control, Log CEO Pay.[14] If ETC indeed serves as a substitute form of CEO pay, we would expect a statistically significant negative relationship between ETC and Log CEO Pay. This is confirmed in column 1: the coefficient on Log CEO Pay is negative and highly statistically significant. Reducing log CEO Pay by 1 SD increases ETC by .18 percentage point. Of course, this result is consistent with the interpretation that stronger managerial incentives, in the form of higher CEO pay, reduce manager excess and waste. We are unable to distinguish the two hypotheses. However, the coefficient estimates on Government Help and Lag Tax Burden barely change with the inclusion of Log CEO Pay.

Our results are also robust for several prominent alternative interpretations of the positive correlation of Lag Tax Burden and firm ETC. The first alternative interpretation is tax evasion: higher tax burdens lead to stronger incentives for tax evasion, and higher values of ETC may simply reflect more tax evasion. This alternative story, however, is not plausible because the tax base in China is revenue, not profit. Indeed, many firms in our sample had net losses, yet they all paid positive taxes. Thus, spending more on ETC would not serve the purpose of tax evasion. In addition, Lag Tax Burden, measured as the city-industry median, is less likely to be directly affected by firm-specific ETC.[15] The second alternative interpretation for the positive correlation between firm ETC and Lag Tax Burden is that a higher tax burden may simply reflect a better auditing and legal system, in which case the positive correlation between ETC and Lag Tax Burden may simply reflect the effect of the omitted legal system. In column 2, we control for Court Share, which is the city-industry median share of commercial disputes resolved by the court system as reported by the firms. Presumably, the more a firm relies on the court system, the more likely that the legal system is better. Clearly, adding this control does not make a difference in our key results. The third alternative interpretation for the positive correlation between ETC and Lag Tax Burden is that it is due to omitting firm profitability in our regression. A highly profitable firm may face a higher tax rate and at the same time attract more harassment from government officials and thus have higher ETC. To check this possibility, we also control for the ratio of lag profit to sales (lagged by 1 period to avoid contemporaneous bias) in column 3. The key results are again not affected. Finally, an artificial correlation between ETC

[14] We do not directly observe CEO pay in our data set. We observe the relative ratio of CEO pay to average middle-manager pay and the ratio of the latter to average worker pay. We compute the absolute CEO pay as the product of the two ratios times the average wage of the firm.

[15] A variation of this concern is that a high tax burden may reflect substitution of ETC for personal income tax. In other words, when firms' tax burdens are high, personal income tax may also be high, and ETC may be used to evade personal income tax. This is not plausible in China because personal income tax rates are uniform across China, and personal income tax is directly withheld from the payroll.

Table 5

Determinants of Entertainment and Travel Costs (ETC): Sensitivity Checks

Variable	(1)	(2)	(3)	(4)
Government Help	−.365** (.139)	−.396** (.139)	−.402** (.139)	−.349** (.133)
Lag Tax Burden	6.865** (2.459)	6.861** (2.399)	6.858** (2.369)	4.592+ (2.374)
Log Years of Relationship	.031 (.062)	−.023 (.071)	−.023 (.071)	.091 (.070)
Sell to Firms in Other Provinces	.459** (.070)	.445** (.077)	.443** (.076)	.645** (.084)
Log CEO Pay	−.132** (.037)			
Court Share		.043 (.138)		
Lag profit/sales			−.092 (.062)	
Log lag sales				−.519** (.042)
N	14,532	14,935	14,937	14,960
Adjusted R^2	.087	.082	.083	.108

Note. The dependent variable is ETC in percentage points. All regressions include the following controls: Private Share, Foreign Share, Log Lagged Labor, Log GDP per Capita, Log Firm Age, industry dummies, survey dummies, and province dummies. Robust standard errors clustered at the city level are in parentheses.

+ Significant at the 10% level.

** Significant at the 1% level.

and Lag Tax Burden may arise because both use sales as the denominator (although the sales are for different years). To check this possibility, in column 4 we control for log sales lagged by 1 period. Again, the qualitative results remain similar, although the coefficient on Lag Tax Burden drops from 6.8 to 4.6.

5. ETC and Firm Performance

Here we examine the impact of ETC on firm performance to shed further light on the nature of ETC. Specifically, we test implications 5 and 6. In our empirical analysis, the performance measure is productivity, primarily TFP. We estimate TFP using the Levinsohn and Petrin (2003) procedure. The Levinsohn-Petrin estimator is easy to implement and addresses the simultaneity issue raised by Marschak and Andrews (1944; see Petrin, Levinsohn, and Poi 2004).[16]

5.1. Ordinary Least Squares Results

Table 6 reports the OLS regression results of the effects of ETC on TFP.[17] The estimates are reassuringly robust across columns 1 and 2. The coefficient estimates for most of the control variables have the expected sign. For instance, firm productivity is higher for larger, younger, foreign-owned firms. Firms located in cities with higher log GDP per capita have higher productivity. Firms that have stronger relationships with trading partners also have higher productivity.[18]

The term ETC has a large and significantly negative effect on TFP. Estimates for the OLS regressions indicate that a 1 SD increase in ETC (.038 from Table 2) reduces TFP by approximately .2. However, when we include the interaction terms between ETC and Government Help and Lag Tax Burden, the effects on TFP of ETC and of the two interaction terms are all statistically significant at the 1 percent level. Consistent with implications 5 and 6 of our model, the private returns from ETC on TFP depend on the proxy variables for K_g^0 and K_p^0. The negative coefficient of ETC × Government Help means that if the government provides lower quality baseline public service, then ETC has smaller negative contributions to firm productivity, which indicates that part of ETC is used as grease money to obtain better government services. The positive coefficient of ETC × Lag Tax Burden means that if a firm faces more government

[16] For the Levinsohn-Petrin method to work, the variable input must not be a deterministic function of state and proxy variables (Woodridge 2005). This assumption is apparently satisfied in our context: the regression of log labor on log capital and log material yields R^2-values of .6–.8 for various industries.

[17] In unreported results, we tried interacting ETC_{ijc} with Years of Relationship (for K_r^0), and the interaction was largely insignificant. This is not surprising, as we found earlier that this variable is not a significant predictor for ETC. Including the interaction of ETC with Years of Relationship also leaves the other results intact.

[18] One surprising result is that domestic private ownership is associated negatively with productivity, although the magnitude is small. This perhaps reflects the fact that domestic private ownership is measured with systematic errors: it captures only individual, but not institutional, private ownership, and therefore it may not capture the benefits of large private shareholders who can internalize the benefits of monitoring.

Table 6

Effects of Entertainment and Travel Costs (ETC) on Total Factor Productivity

	OLS		GMM	
Variable	(1)	(2)	(3)	(4)
Government Help	−.021 (.064)	.068 (.068)	−.036 (.039)	.025** (.076)
Lag Tax Burden	−.504 (.889)	−1.290 (.988)	−.301 (.637)	−2.846** (.895)
Log Years of Relationship	.175** (.022)	.175** (.022)	.174** (.020)	.174** (.021)
Sell to Firms in Other Provinces	.275** (.028)	.278** (.027)	.291** (.026)	.315** (.026)
Private Share	−.064* (.027)	−.067* (.027)	−.065** (.021)	−.073** (.022)
Foreign Share	.332** (.063)	.325** (.063)	.328** (.034)	.301** (.035)
Log Lagged Labor	.204** (.010)	.202** (.010)	.193** (.020)	.180** (.012)
Log GDP per Capita	.307** (.038)	.303** (.038)	.306** (.020)	.290** (.020)
Log Firm Age	−.208** (.017)	−.206** (.017)	−.206** (.012)	−.199** (.012)
ETC	−5.113** (.709)	−6.076** (1.631)	−8.516** (2.943)	−15.362** (4.249)
ETC × Government Help		−8.026** (1.946)		−22.963** (5.505)
ETC × Lag Tax Burden		53.650** (21.697)		180.934** (40.207)
∂TFP/∂ETC:				
At means of Government Help and Lag Tax Burden		−6.286** (.718)		−14.77** (3.21)
At Lag Tax Burden 1 SD above its mean and mean Government Help		−5.210** (.633)		−11.15** (3.01)
At Government Help 1 SD below its mean and mean Lag Tax Burden		−4.011** (.880)		−8.26** (3.34)

Note. The dependent variable is the Levinsohn-Petrin estimate of the total factor productivity, estimated separately for each industry. All specifications include industry, province, and survey dummies. For the generalized method of moments (GMM) specifications, the instrumental variable for ETC is its city-industry median. For specification 3, first-stage $F = 39.25$ and Shea partial $R^2 = .011$. For specification 4, the F-statistics from the three first-stage regressions are 16.4, 40.7, and 13.8, and Shea partial R^2-values are .044, .057, and .097. Robust standard errors clustered at the city level are in parentheses. The adjusted R^2-values are .507 and .509 for specifications 1 and 2, respectively. $N = 14{,}503$. OLS = ordinary least squares.

* Significant at the 5% level.

** Significant at the 1% level.

expropriation, ETC also has smaller negative contributions to firm productivity, which indicates that part of ETC is spent as protection money to reduce government expropriation. These results lend strong support to our hypotheses.

At the bottom of Table 6, we report ∂TFP/∂ETC, taking into account both the direct and the interaction effects. Evaluated at the mean level of Government Help and Lag Tax Burden, ∂TFP/∂ETC is −6.3. A 1 SD (.038) increase in ETC is associated with a reduction in TFP of .24 (or 17 percent of an SD of TFP). However, when the institutional environment is worse, the negative ∂TFP/∂ETC becomes less pronounced. When Government Help decreases by 1 SD, ∂TFP/∂ETC becomes −4.0, which is roughly a one-third drop in magnitude from −6.3; similarly, when Lag Tax Burden increases by 1 SD, ∂TFP/∂ETC becomes −5.2, which is roughly a one-fifth drop in magnitude from −6.3.

5.2. Generalized Method of Moments Results

Since ETC is an endogenous variable, the OLS estimate of the effect of ETC on TFP is likely inconsistent because there may be omitted factors that affect both a firm's ETC and its TFP. To deal with this issue, we need to find an instrumental variable that is significantly correlated with firm ETC but does not directly affect the outcome except indirectly through ETC.

We propose using the median ETC in the firm's city-industry cell as the instrument for the firm's ETC. This choice of instrument is justified by our theoretical model. In Section 2, we show that a firm's grease money x_g^* is a function of government service quality K_g^0, and its protection money x_p^* is a function of K_p^0. To the extent that some components in K_g^0 and K_p^0 are not fully captured by their proxies, and firms within the same city and industry all have to deal with these unmeasured components (some are common to all of them, and some are firm specific), then their expenditures x_g^* and x_p^* should be correlated.[19] Here our identifying assumption is that the city-industry median ETC as a proxy of local corruption tendency is correlated with firm ETC but does not directly affect firm TFP once other city-industry controls (including regional and industry dummies) are included in the regression. For the interaction terms of ETC with Government Help and with Lag Tax Burden, we use the corresponding interaction of city-industry median ETC with these terms as instruments. Our identification assumption may be violated when the city-industry median ETC may affect firm productivity directly (that is, not just through firm ETC)—after all, we control for regional dummies and industry dummies separately and do not control for full city-industry dummies. To the extent that there are city-industry-level variables that are omitted from the productivity equation and directly affect productivity, our identifying assumption is violated, and our generalized method of moments (GMM) estimates may still be incon-

[19] These arguments are similar to those of Nevo (2001), who argues that regional average prices (excluding the city being instrumented) can be used as an instrument for the city-level price because both prices respond to the product's common marginal cost.

sistent. The GMM results, therefore, should be viewed as another bit of suggestive evidence rather than as definitive.

We find that the median ETC in a firm's city-industry cell is strongly correlated with the firm's own ETC: the note to Table 6 shows that we have a strong first stage in the sense of Bound, Jager, and Baker (1995). The table shows that the GMM results are remarkably similar to those of the OLS specification. The GMM results differ from the OLS results in that the magnitudes of ∂TFP/∂ETC have become larger. For the specification in column 3, ∂TFP/∂ETC changes from about -5.1 in OLS to about -8.5 in GMM, which suggests that ETC is positively correlated with the unobservable determinants of firm performance. However, as we show at the bottom of Table 6, ∂TFP/∂ETC at the means of Government Help and Lag Tax Burden is about -14.77. A 1 SD increase in ETC (.038) increases TFP by .56, or 40 percent of the standard deviation of TFP. As before, ∂TFP/∂ETC becomes more muted when Lag Tax Burden increases or when Government Help decreases.

It is also interesting to use the estimated coefficients to examine how much of the differences in productivity between inland and coastal areas can be explained by their differences in ETC. The inland firms spent about .65 percent more on ETC than firms in coastal areas (see Table 1). Using the ETC coefficient in column 3, we see that the sample differences in ETC between inland and coastal firms can explain a difference of $.0065 \times 8.516 \approx .055$ in TFP. In the sample, firms in the coastal area have an average TFP that is .69 higher than those of inland firms. Thus, close to $.055 \div .69 \approx 8$ percent of the productivity differences between inland and coastal areas can be explained by the differences in ETC according to the no-interaction model. The corresponding value is about 6 percent when using the coefficient estimates with the interaction terms. Thus, ETC and corruption play a significant, although not a major, role in explaining the inland disadvantage in productivity.[20]

5.3. Three Additional Robustness Checks

First, the main results are robust to various ways of measuring productivity. In the previous section, we used the Levinsohn-Petrin estimate of TFP. But the qualitative and quantitative results reported in Table 6 are robust to three alternative measures of productivity:[21] the fixed-effects estimates of productivity assuming Cobb-Douglas production function,[22] the fixed-effects estimates of

[20] Of course, the total effects of ETC may be higher because the effects may also show up in shifting of the skilled labor force to low ETC areas, slower investment in higher ETC areas, and so on. We also found a strong negative relationship between city average ETC and city growth rate in GDP per capita. The correlation is $-.49$, with a p-value of close to zero.

[21] See Cai, Fang, and Xu (2005) for these omitted results.

[22] The productivity is estimated individually for each two-digit industry, allowing for firm fixed effects and using the value-added capital-labor framework. Note that although our regression is based on cross-sectional data because our key variables (ETC from accounting books and qualitative variables from the manager survey) are available for the last year of the 3-year panel, for the purpose of estimating productivity, we have full 3-year panel data, so fixed-effects estimation is possible.

productivity assuming a more general translog production function, and simple labor productivity measured as log value added per employee.

Second, we examine how the main results differ by income level. The value of ETC is higher in low-income regions (see Table 3), which also tend to have worse institutional environments in terms of lower values for Government Help and higher Lag Tax Burden. Our theory would suggest, relative to the high-income region, that ETC spending by firms in low-income regions should be more effective in improving TFP. To check this, we separate our data into firms from high- and low-income cities, according to whether the city's real GDP per capita is above or below the median. Table 7 reports the results. Indeed, the negative effects of ETC are much more pronounced in the sample of high-income cities. In addition, when Government Help decreases or Lag Tax Burden increases by 1 SD from its mean, the effect of ETC on TFP becomes statistically insignificant in low-income regions, while it does not change much in high-income regions. Thus, for low-income regions featuring a particularly bad institutional environment, ETC can be a productive investment in helping firms obtain better government services and protecting them from excessive government expropriation.

Third, we show that the main results are robust when we remove the business-related component of ETC from ETC. Since we have shown that ETC is a mixture of normal business expenditure (including implicit CEO pay), managerial excesses, and government bribes, it may make sense to simply focus on the non-business-related ETC to see how it affects firm performance. To see whether our qualitative results are affected by this concern, we first construct a non-business-related ETC (NB-ETC) as the regression residual of ETC on several variables that can be plausibly classified as business related (including Log Lagged Labor, Log Firm Age, Sell to Firms in Other Provinces, Log Years of Relationship, and Log CEO Pay). We then relate TFP to NB-ETC, analogous to our earlier analysis reported in Table 6. The results reported in Table 8 confirm the results in Table 6.

6. Conclusion

We use unique large firm-level data sets from China to analyze the determinants and effects of entertainment and travel costs of Chinese firms, a standard expenditure item in the accounting book of Chinese firms. We rely on the predictions from a simple model of managerial decision making to identify components of ETC by examining how the total ETC responds to different institutional environment variables. In our empirical analysis, we find strong evidence that firms' ETC consists of a mix that includes expenditures on government officials in the form of grease money and protection money, normal business expenditures, implicit CEO pay, and managerial excesses. Overall, ETC has a significantly negative effect on firm productivity, but its negative effect is much less pronounced for firms located in cities with low-quality government

Table 7

Effects of Entertainment and Travel Costs (ETC) on Total Factor Productivity: High- and Low-Income Cities

Variable	High-Income Cities (N = 7,308)		Low-Income Cities (N = 7,269)	
	OLS	GMM	OLS	GMM
ETC	−5.163** (2.042)	−24.954* (11.979)	−7.139** (2.130)	−17.368** (5.314)
ETC × Government Help	−7.300* (3.234)	−15.022 (9.801)	−8.364** (2.451)	−27.726** (8.490)
ETC × Lag Tax Burden	30.038 (27.240)	145.309^{+} (78.325)	77.791* (31.622)	312.191** (78.266)
Adjusted R^2	.50		.51	
∂TFP/∂ETC:				
At means of Government Help and Lag Tax Burden	−6.17** (1.02)	−23.40** (8.73)	−6.41** (.68)	−12.59** (3.81)
At Lag Tax Burden 1 SD above its mean and mean Government Help	−5.56** (.97)	−20.49* (7.84)	−4.85** (.72)	−6.33 (4.13)
At Government Help 1 SD below its mean and mean Lag Tax Burden	−4.10** (1.19)	−19.14* (9.63)	−4.04** (.95)	−4.73 (3.65)

Note. The dependent variable is the Levinsohn-Petrin estimate of the total factor productivity, estimated separately for each industry. Other controls include Government Help, Lag Tax Burden, Log Years of Relationship, Sell to Firms in Other Provinces, Private Share, Foreign Share, Log Lagged Labor, Log GDP per Capita, and Log Firm Age. Robust standard errors clustered at the city level are in parentheses. OLS = ordinary least squares; GMM = generalized method of moments.

$^{+}$ Significant at the 10% level.

* Significant at the 5% level.

** Significant at the 1% level.

Table 8

Effects of Non-Business-Related Entertainment and Travel Costs (ETC) on Total Factor Productivity

	OLS		GMM	
Variable	(1)	(2)	(3)	(4)
NB-ETC	−4.840** (.582)	−6.293** (1.319)	−5.074** (1.656)	−16.965** (3.282)
NB-ETC × Government Help		−7.189** (1.811)		−17.210** (5.736)
NB-ETC × Lag Tax Burden		58.886** (17.698)		239.268** (44.830)
Adjusted R^2	.51	.51		
∂TFP/∂ (NB−ETC):				
At means of Government Help and Lag Tax Burden		−6.01** (.48)		−12.03** (2.19)
At Lag Tax Burden 1 SD above its mean and mean Government Help		−4.83** (.47)		−7.23** (1.87)
At Government Help 1 SD below its mean and mean Lag Tax Burden		−3.97** (.72)		−7.15** (1.83)

Note. The dependent variable is the Levinsohn-Petrin estimate of the total factor productivity, estimated separately for each industry. Other controls include Government Help, Lag Tax Burden, Log Years of Relationship, Sell to Firms in Other Provinces, Private Share, Foreign Share, Log Lagged Labor, Log GDP per Capita, and Log Firm Age. NB-ETC is the regression residual of ETC on Log Lagged Labor, Log Firm Age, Sell to Firms in Other Provinces, Log Years of Relationship, and Log CEO Pay. Robust standard errors clustered at the city level are in parentheses. $N = 14{,}086$. OLS = ordinary least squares; GMM = generalized method of moments.

* Significant at the 1% level.

services, firms subject to severe government expropriation, and firms located in poor regions.

Our paper echoes the message of Acemoglu and Johnson (2005) in demonstrating that corruption is affected by various institutional factors; as a result, a negative overall correlation between corruption and firm performance does not necessarily indicate that all components of corruption worsen firm performance. It is important to point out, however, that while we find that parts of ETC expenditures have a positive influence on firm performance, this does not necessarily imply that these components of ETC expenditures are socially efficient "grease." Our finding implies that, in economies with weak institutions, firms may find it individually rational to pay bribes and government officials may find it individually rational to accept bribes. However, to evaluate the social efficiency of bribes, we must take into account the possibility that bribing and government institutions are determined jointly in equilibrium. If, for example, government officials intentionally reduce their service quality to extort more bribes, then banning corruption in the whole economy can improve the quality of government service.

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