The Impact of Related Party Sales by Listed Chinese Firms on Earnings Informativeness and Earnings Forecasts*

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ABSTRACT

Using a random sample of 140 of China's listed firms, we show an adverse impact of related party (RP) sales of goods and services on the usefulness of accounting earnings to investors and on the quality of earnings forecasts by financial analysts. Consistent with the contention that RP sales may violate the arm's-length assumption of regular transactions and consequently impair the representational faithfulness and verifiability of accounting data, we find that earnings of firms engaged in RP sales are at least 33% less informative after controlling for factors known to affect earnings informativeness. We also find that financial analysts are overly credulous in their acceptance of earnings numbers that are contaminated by unreliable RP sales, and provide less accurate and more optimistic earnings forecasts for firms with more RP sales. Overall, our results provide strong empirical evidence on the negative impact of RP transactions on the usefulness of accounting earnings data used by investors and by financial analysts.

JEL classification: M41; G14; G24

Keywords: Related Party Sales; Earning Informativeness; Earnings Quality; Earnings Forecasts; China

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1. INTRODUCTION

This paper investigates the impact of related party (RP) transactions on earnings informativeness as perceived by investors and the quality of earnings forecasts made by financial analysts. RP transactions may violate the arm's-length assumption of regular transactions and consequently impair the representational faithfulness and verifiability of accounting data. Recent corporate scandals such as Enron and Adelphia, to name just two, exemplify how RP transactions may reduce the reliability of reported earnings. The Financial Accounting Standards Board (FASB) has long been expressing concerns about the possible negative impact of RP transactions on the reliability of financial information, in terms of both representational faithfulness and reliability of reported amounts (SFAS 57, 15), while previous research provides empirical evidence of a significant positive association between RP transactions and earnings manipulation (e.g., Gordon and Henry 2003, in the US, and Aharony, Wang, and Yuan 2010, in China). The evidence suggests the possibility of an adverse impact of RP transactions on the quality of accounting numbers.

There are various types of RP transactions. On a set of RP transactions for 366 American public firms that they hand-collected during the years 2000-2001, Gordon and Henry (2003) identify several major types of RP transactions, such as direct transactions with employees or with board members, contract services or legal services acquired from management, sales to (purchases from) related parties and loans to (from) related parties. Their statistics show that 47% of their sample firms provided loans to RPs, 20.2% engaged in direct service relations involving an executive and another related party, while 19.2% made purchases from RPs, and

11.3% made sales to related parties. In contrast, Aharony *et al*. (2010) show that around 60% of Chinese initial public offerings during the period 1999-2001 engaged in sales of goods and services to their controlling parent companies, in a mean dollar amount of US$ 23.57 million, compared with a mean of US$3.66 million for Gordon and Henry's (2003) American sample.

Our study focuses on the impact of RP sales of goods and services on earnings informativeness as perceived by capital market investors, and on the quality of analysts' earnings forecasts, the reason being that RP sales have the most direct impact on earnings number. We choose a Chinese setting for our analysis because China provides both a unique institutional setting and RPT data. Our results provide an assessment of the extent to which RP sales of goods and services contribute to impairing earnings informativeness and the quality of analysts' forecasts.

We randomly select 140 firms out of 383 firms that were listed on the Shanghai Stock Exchange in 1997. We then hand-collect all RP sales of goods and services data for the 140 companies, from their annual reports during the period of 1998 to 2004. Statistical analysis of the data collected for our sample firms indicate that they are not significantly different in their characteristics from the entire population of 383 firms. Both our two-way fixed effect panel data analysis and our pooled ordinary least square regressions suggest that RP sales significantly reduce earnings informativeness in China. The results are robust after controlling for factors that may affect earnings informativeness such as firm size, market-to-book ratio, and leverage. In addition, we find that Chinese financial analysts do not account for the adverse impact of RP sales on earnings. In particular, their forecasts are considerably less accurate for firms with more RP sales of goods and services, and the forecasts they provide become ever more excessively optimistic the more firms engage in RP sales. These results suggest that financial analysts are

unduly willing to trust earnings numbers that are contaminated by unreliable RP sales, consistent with the evidence in Teoh and Wong (2002) on the credulity of financial analysts. In summary, our results suggest that RP sales significantly reduce both earnings informativeness to investors and the quality of analysts' earnings forecasts in China.

The remainder of the paper is organized as follows. In section II, we provide the institutional background on China's disclosure of RP transactions. Section III discusses prior research and develops our hypotheses. We present the research design, data and empirical results of the impact of RP sales on earnings informativeness and on the quality of analysts' forecasts in sections IV and V, respectively. Section VI provides a conclusion.

2. INSTITUTIONAL BACKGROUND

In 1997, the Chinese Ministry of Finance, which serves as the accounting standards setter in China, promulgated an accounting standard for RP transactions (hereafter, the *RPT Standard*), which requires publicly listed companies to disclose all material RPTs in the form of notes to the financial statements. The RPT Standard defines RPTs to include transactions occurring between a listed firm and its parent company or with another affiliated firm. However, the related parties need not necessarily be other listed companies. They may also be a listed firm and its management, board members, principal owners, or members of the immediate families of any of these groups. Nevertheless, as Chinese firms are largely owned by corporate shareholders, almost all RP transactions are executed between listed firms and their respective affiliated firms such as parent companies or other subsidiaries of these parent companies (Aharony *et al*. 2010).

The RPT Standard has relatively detailed disclosure requirements, similar to those set forth by SFAS 57 in the USA (Gordon, Henry and Palia 2004). The disclosure must include

information on the nature of the relationship between the parties involved, the core operations of each related party, a description of the nature of each type of transaction, and information on the amounts involved. The RPT Standard also lists the various types of RPTs that publicly listed firms must disclose in the form of notes to the financial statements: sales and purchases of goods and services, commission relationships, overhead reimbursements, transfer of R&D, permits and franchises, trade of assets other than goods, including exchange of fixed assets, capital and operating leases and borrowing or lending, including interest payments.

3. PRIOR RESEARCH AND HYPOTHESES

Concerns that RP transactions could adversely impact the reliability of financial information both in terms of representational faithfulness and reliability of reported amounts date back to 1982, when the FASB issued the Statement of Financial Accounting Standards No. 57. As pointed out in SFAS 57, "transactions involving related parties cannot be presumed to be carried out on an arm's-length basis, as the requisite conditions of competitive, free-market dealings may not exist." It further elaborates that "relationships between parties may enable one of the parties to exercise a degree of influence over the other such that the influenced party may be favored or caused to subordinate it independent interests" (para. 13, FASB 1982). Such concerns did not draw much attention until the outburst of the recent accounting scandals of Enron, Adelphia and others. Enron used special purpose entities controlled by its CEO to manipulate income and Adelphia guaranteed related party debt and provided extensive loans to executives. In both cases, the result was irrelevant and unreliable accounting information. Nevertheless, there is limited empirical evidence on the impact of RP transactions on the quality of key accounting information such as earnings. To the best of our knowledge, Gordon and

Henry (2003) is the first and only study to use US data to show the impact of RP transactions on earnings quality. They show that absolute abnormal accruals are positively associated with RP transactions, suggesting that this is due to the incentive of managers to manipulate earnings to mask their expropriation from RP transactions. As abnormal accruals are well accepted as a measure of earnings quality (see, e.g., Dechow and Schrand 2004), Gordon and Henry's results imply that RP transactions may reduce earnings quality.

The adverse impact of RP transactions on earnings quality is also documented in a China setting. Jian and Wong (2010) show that Chinese listed companies with group structure are more likely to engage in RP sales with their parent companies to manipulate earnings. Aharony *et al*. (2010) present evidence of earnings management through RP sales during the IPO process in China. They also show that abnormal RP sales are positively associated with abnormal accruals. Overall, these studies provide empirical evidence of earnings management via or induced by RP transactions.

The adverse impact of RP transactions on earnings quality implies an adverse impact on the usefulness of earnings to investors insofar as earnings usefulness is highly dependent on earnings quality (Dechow and Schrand 2004). Following Francis, Schipper, and Vincent (2005), we use earnings informativeness to measure the usefulness of accounting information. Accordingly, our first hypothesis is stated as follows (in alternative form):

H_1: *Earnings informativeness is negatively associated with the level of the firm's RP sales of goods and services.*

Prior studies suggest that financial analysts are credulous in the sense that they cannot identify earnings quality erosion due to factors such as opportunistic earnings management. For example, Teoh and Wong (2002) show that financial analysts systematically underestimate the

extent of earnings management, and therefore are overly ready to believe that high accruals reflect good news. As already noted, Aharony *et al*. (2010) show that Chinese companies engage in RP sales of goods and services to manipulate their earnings and that there is a significant positive association between RP sales and absolute abnormal accruals. Consequently, we expect to find that Chinese financial analysts are also more credulous about firms that engage in higher level of RP sales of goods and services, and that the result will be a higher forecast error and more optimistic earnings forecasts. Formally stated, our second hypothesis (in alternative form) is:

H_2: Financial analysts' earnings forecasts are less accurate and more optimistic for firms that engage in a higher level of RP sales of goods and services.

4. THE IMPACT OF RP SALES ON EARNINGS INFORMATIVENESS

4.1 Research design

To test whether earnings informativeness is decreasing with the level of RP sales of goods and services (H_1), we investigate whether differential earnings informativeness exists between firms with RP sales and firms without RP sales. Following Easton and Harris (1991), Francis *et al*. (2005) and others, we assess informativeness by the magnitude of the earnings response coefficient (ERC), i.e., the slope coefficients obtained from regressions of annual returns on both the level of and change in annual earnings. We include interactions between earnings (and changes in earnings) and the level of RP sales and interpret the respective estimated coefficients as evidence of differences in earnings informativeness or lack of such evidence. We also include in these regressions four control variables that have been shown in

prior research to affect earnings informativeness (losses, firm size, market to book ratio and financial leverage). Accordingly, we run the following two regression models:

$$RET_{j,t} = \alpha_0 + \alpha_1 EARN_{j,t} + \alpha_2 EARN_{j,t} * RPS_{j,t} + \sum_{k=1}^{4} \beta_k EARN_{j,t} * CON_{j,t}^{k} + \varepsilon_{j,t}, \quad (1a)$$

$$RET_{j,t} = \alpha_0 + \alpha_1 EARN_{j,t} + \alpha_2 EARN_{j,t} * RPS_{j,t} + \alpha_3 \Delta EARN_{j,t} + \alpha_4 \Delta EARN_{j,t} * RPS_{j,t}$$
$$+ \sum_{k=1}^{4} \beta_k EARN_{j,t} * CON_{j,t}^{k} + \sum_{k=1}^{4} \gamma_k \Delta EARN_{j,t} * CON_{j,t}^{k} + \upsilon_{j,t}, \quad (1b)$$

where:

$RET_{j,t}$ = firm *j*'s 12-month cumulative raw stock return over the period beginning in the fifth month following the end of fiscal year *t*-1 to the fourth month after fiscal year *t*;

$EARN_{j,t}$ = firm *j*'s net income in year *t*, scaled by the market value of equity as of year-end *t*-1;

$\Delta EARN_{j,t}$ = change in net income between year *t* and *t*-1, scaled by the market value of equity as of year-end *t*-1;

$RPS_{j,t}$ = firm *j*'s sales of goods and services to its related parties for year *t*, scaled by total net sales for year *t*;

$CON_{j,t}^{k}$ = a vector of control variables, *k* = 1, 2, 3, and 4:

$CON_{j,t}^{1}$ = $LOSS_{j,t}$ = 1 if $EARN_{j,t} < 0$, and 0 otherwise;

$CON_{j,t}^{2}$ = $SIZE_{j,t}$ = the natural log of firm *j*'s total assets as of year-end *t*;

$CON_{j,t}^{3}$ = $MBE_{j,t}$ = the ratio of firm *j*'s market value of equity to book value of equity as of year-end *t;*

$CON^{4}_{j,t}$ = $DEBT_{j,t}$ = firm *j*'s leverage, measured as the ratio of firm *j*'s long-term debt to total book value of assets as of year-end *t.*

We include the four control variables in our regression analyses because prior studies have shown that each is associated with the magnitude of the ERC, our measure of earnings informativeness. Hayn (1995) documents that the ERC is smaller for loss observations than for profit observations; Chaney and Jeter (1992) find the ERC is increasing in firm size while Freeman (1987) reports that it is negatively related to firm size; Collins and Kothari (1989) show that the market-to-book ratio, a common measure of the firm's growth, is positively associated with earnings informativeness; finally, Dhaliwal *et al*. (1991) report that the ERC is negatively associated with financial leverage.

To test hypothesis H_1 we examine the magnitude of the estimated coefficient for the interaction between earnings and the level of RP sales (α_2) in model (1a). Similarly, for model (1b) we examine the magnitude of ($\alpha_2 + \alpha_4$), the sum of the estimated coefficients for the interactions of level of RP sales with earnings and change in earnings, respectively. An adverse impact of RP sales on earnings informativeness implies $\alpha_2 < 0$ for the first model and ($\alpha_2 + \alpha_4$) < 0 for the second model.

4.2 Sample selection and data

Our sample consists of 140 companies that were randomly selected without replacement from the entire population of 383 companies listed on the Shanghai Stock Exchange in 1997. As shown below, our sample firms' characteristics well represent those of the entire population. For each firm, we manually collected all data on RP sales of goods and services from the annual reports for the seven-year period 1998 to 2004, a total of 980 firm-year observations. Other

accounting and financial information was obtained from the China Stock Market & Accounting Research (CSMAR) database, the leading supplier of both financial accounting data and stock prices for all listed companies in China.

Table 1 presents the sample composition classified by nine major industries (two-digit SIC code). The industry classification was first obtained from the China Securities Regulatory Committee. We then reclassified the industries into nine categories based on Campbell (1996). As there are only a small number of firms in the petroleum industries (SIC code 13, 29), we combine them with the basic industries. The sample excludes the utility industries (SIC code 46, 48, 49) and the financial services industries (SIC code 60-69). As Table 1 shows, the total sample is about 37% of the entire population. Per industry, we randomly selected from 25% to 35% of the respective population except for the services industry (76%) and the transportation industry (53%). The last two columns of Table 1 present the median size (in terms of total assets) of our sample firms per industry as of December 31, 1998 and the corresponding figures for the entire population per industry, respectively. A Wilcoxon signed-rank test (not tabulated) indicates that none of the paired medians are significantly different from each other at the 5 percent level or lower.

[Insert Table 1 Here]

Table 2 presents summary statistics for the variables in models (1a) and (1b). We winsorize the observations of each continuous independent variable by half a percent in each tail. As depicted in the table, on the average, the 140 sample firms earned an 11.78% annual return during the sample period 1998 to 2004, compared with a 9.35% annual return for the 243 non-

sample firms in the same period. The mean of earnings scaled by market value is about 1.68% while the mean of change in earnings scaled by market value is close to 0% (compared with 1.95% and 0%, respectively, for the non-sample firms). Notably, on the average, RP sales of goods and services account for 11.56% of total net sales and more than half (51.47%) of the sample firms have RP sales with their parent companies. As for the control variables, 8.63 percent of the sample firms report losses during the sample period; on the average, size measured by total assets' book value is 2,003 million RMB (total equity market value is 3,110 million RMB), market-to-book ratio is 3.90 and financial leverage ratio is 7.75%. In comparison, of the remaining 243 non-sample firms listed on the Shanghai Stock Exchange during the same period, 9.58 percent report losses, and on the average, their size, measured by total assets, is 2,319 million RMB (total equity market value is 3,310 million RMB), their market-to-book ratio is 4.33, and their financial leverage ratio is 7.15%. Either a *t*-test between mean values or a Wilcoxon signed-rank test between medians (not tabulated) indicates that there is no significant difference between our randomly selected sample and the remaining non-selected firms on the Shanghai Stock Exchange for any of the summary statistics reported above.

[Insert Table 2 here]

4.3 Empirical results

We use pooled ordinary least square (OLS) regressions to estimate models (1a) and (1b). To control for possible heteroskedasticity and autocorrelation problems, we also employ two-way fixed effects panel data regressions. The disadvantage of the fixed effects analysis is its relatively low power, due to the large number of dummy variables that may sap the model of the

degrees of freedom required for adequately powerful statistical tests. Moreover, a model with a large number of such variables may be plagued with multicollinearity, which increases the standard errors, thereby draining the model of statistical power to test parameters.

Panel A of the Appendix shows the correlation coefficients among the variables in the earnings informativeness analysis. As expected, both earnings level and changes are positively associated with annual stock returns. Among the independent variables, we observe large correlation coefficients, particularly among earnings level, earnings changes, and losses. For example, the correlation coefficient between firm losses (LOSS) and earnings level (EARN) is -0.684 with *p*-value of 0.000. To alleviate concerns about problems of multicollinearity among the independent variables, we calculate the Variance Inflation Factor (VIF) for all OLS regression variables. Neter, Wasserman and Kunter (1983) suggest that a VIF level below 10 indicates the absence of multicollinearity problems. The results of these tests indicate that none of the independent variables has a VIF value that exceeds 2. We conclude, therefore, that no serious multicollinearity problem is present in the regression analysis.

The regression results reported in Table 3 strongly support hypothesis H_1 that earnings informativeness is negatively associated with the firm's level of RP sales of goods and services. This is evident from the estimated coefficients of our main variables of interest, *EARN*RPS* and *ΔEARN*RPS*. In model (1a), the estimated coefficient of *EARN*RPS*, $\hat{\alpha}_2$, is -2.501 (*p*-value = 0.001) for the pooled regression and -1.640 (*p*-value = 0.008) for the two-way fixed effect regression. In model (1b), the estimate of ($\hat{\alpha}_2 + \hat{\alpha}_4$) is -3.933 (*p*-value of 0.030) for the pooled regression and -3.396 (p-value of 0.019) for the two-way fixed effect regression.

[Insert Table 3 here]

Consistent with prior research (e.g., Easton and Harris 1991 and Francis *et al*. 2005 in the US, and Chen, Chen, and Su, 2001 in China) all regression results in Table 3 show that the earnings response coefficients (ERC), relating stock returns to the level and change in earnings, are positive and significant. For example, for the pooled regression, $\hat{\alpha}_1$, the estimated coefficient of *EARN*, is 5.747 (*p*-value of 0.001) in model (1a) and $\hat{\alpha}_3$, the estimated coefficient of *ΔEARN* is 3.781 (*p*-value of 0.048) in model (1b). The effects of RP sales on the magnitude of deterioration in earnings informativeness may be assessed by the ratio of $\hat{\alpha}_2$ to $\hat{\alpha}_1$ in model (1a), or the ratio of $(\hat{\alpha}_2 + \hat{\alpha}_4)$ to $(\hat{\alpha}_1 + \hat{\alpha}_3)$ in model (1b). The coefficient estimates obtained from the two-way fixed effect regressions indicate that earnings of firms with RP sales are about 45% - 48% less informative ((-1.640/3.637) =-45% in model (1a) and -3.396/(4.749 + 2.400) = -48% in model (1b)). Based on pooled regressions, earnings of firms with RP sales are about 33% - 44% less informative (-2.501/5.747= -44% in model (1a) and -3.933/(7.975 + 3.781) = -33% in model (1b)).

The estimated coefficients for the control variables in both regressions are generally consistent with those reported in prior literature. The loss (*LOSS*) observations reduce the ERC, as evidenced by the negative and highly significant coefficient estimates $\hat{\beta}_1$ in model (1a) and $(\hat{\beta}_1 + \hat{\gamma}_1)$ in model (1b). These results are consistent with those of Hayn (1995). Firm size (*SIZE*) increases earnings informativeness, as evidenced by the positive and highly significant coefficient estimates $\hat{\beta}_2$ in model (1a) and $(\hat{\beta}_2 + \hat{\gamma}_2)$ in model (1b) obtained by the two-way fixed effects regressions (though they are positive but statistically insignificant in the pooled regressions). These results are consistent with those of Chaney and Jeter (1992). Consistent with

Collins and Kothari (1989), the results for the pooled regression show that the market-to-book ratio of equity (*MBE*) is positively associated with earnings informativeness. This is evidenced by the positive and highly significant coefficient estimates $\hat{\beta}_3$ in model (1a) and ($\hat{\beta}_3 + \hat{\gamma}_3$) in model (1b). However, for the two-way fixed effects regressions the corresponding coefficient estimates are negative and highly significant. We have no explanation for this. Lastly, consistent with Dhaliwal *et al*. (1991), we find a negative effect of financial leverage (*DEBT*) on earnings informativeness. This is demonstrated by the negative coefficient estimates $\hat{\beta}_4$ in model (1a) and ($\hat{\beta}_4 + \hat{\gamma}_4$) in model (1b) in both the pooled and two-way fixed effects regressions. However, while in the former the corresponding coefficient estimates are highly statistically significant, in the latter they are not.

5. THE IMPACT OF RP SALES ON THE QUALITY OF ANALYSTS' EARNINGS FORECASTS

5.1 Research design

To test whether financial analysts' earnings forecasts are less accurate and more optimistic for firms that engage in a higher level of RP sales of goods and services (H_2), we first estimate two important properties of earnings forecasts: forecast accuracy and forecast bias. Following the tradition in the literature (e.g., Duru and Reeb 2002), we measure financial analysts' earnings forecast accuracy, for each firm-year observation, by the absolute value of the difference between the consensus analysts' earnings per share forecast and the actual earnings per share, scaled by the stock price at the latest forecast date:

$$ACCU_t = (-1)\frac{|\,FORECAST_t^{t-1} - EPS_t\,|}{PRICE_{t-1}}, \qquad (2)$$

where

$ACCU_t$ = the negative of the consensus absolute forecast error for year *t*;

$FORECAST_t^{t-1}$ = the consensus analysts' earnings per share forecast for year *t* made prior to actual earnings announcement for year *t*;

EPS_t = the actual earnings per share for year *t*;

$PRICE_{t-1}$ = the stock price per share at the latest forecast date.

Multiplying this absolute forecast error by (-1) gives a measure that increases with greater forecast accuracy. Thus, when a firm attribute is positively associated with *ACCU*, such an attribute contributes to a more accurate analyst forecast.

We measure financial analysts' earnings forecast bias (*BIAS*), for each firm-year observation, as the signed forecast error, defined as the difference between the consensus analysts' earnings per share forecast and the actual earnings per share, scaled by the stock price at the latest forecast date:

$$BIAS_t(OPTIMISM) = \frac{FORECAST_t^{t-1} - EPS_t}{PRICE_{t-1}}. \qquad (3)$$

Forecast optimism increases as *BIAS* becomes larger. Thus, when a firm attribute is positively associated with *BIAS*, such an attribute contributes to a more optimistic analyst forecast.

We next examine the association between RP sales of goods and services and each of the two forecast properties, *ACCU* and *BIAS*, by regressing each measure separately on the level of RP sales of goods and services and on six control variables that have been shown in prior studies to influence the two properties of analysts' forecasting: accuracy and bias. Accordingly, we run the following regression model:

$$ACCU_{j,t}(BIAS_{j,t}) = \alpha_0 + \alpha_1 RPS_{j,t} + \alpha_2 SIZE_{j,t} + \alpha_3 LOSS_{j,t} + \alpha_4 \Delta EARN_{j,t} + \alpha_5 HORZ_{j,t}$$

$$+ \alpha_6 FOL_{j,t} + \alpha_7 DISP_{j,t} + TimeDummies + IndustryDummies + \varepsilon_{j,t}, \qquad (4)$$

where:

$ACCU_{j,t}$ = firm *j*'s earnings forecast accuracy in year *t* as defined by Eq (2);

$BIAS_{j,t}$ = firm *j*'s earnings forecast bias in year *t* as defined by Eq (3);

$RPS_{j,t}$ = firm *j*'s sales of goods and services to its related parties for year *t*, scaled by total net sales in year *t*;

$SIZE_{j,t}$ = the natural log of firm *j*'s total assets as of year-end *t*;

$LOSS_{j,t}$ = a dummy variable, equal to one when firm *j*'s net income for year *t* is negative, and zero otherwise;

$\Delta EARN_{j,t}$ = change in net income between year *t* and *t*-1, scaled by the market value of equity as of year-end *t*-1;

$HORZ_{j,t}$ = firm *j*'s forecast horizon in year *t*, expressed as the number of months between the forecast's month and the end of fiscal year *t*;

$FOL_{j,t}$ = number of financial analysts following firm *j* in year *t*;

$DISP_{j,t}$ = financial analysts' forecast dispersion, measured as the standard deviation of firm *j*'s analysts' forecasts in year *t* deflated by the stock price per share at the forecast date.

TimeDummies = six dummies for the seven-year period 1998-2004.

IndustryDummies = eight dummies for the nine industries outlined in Table 1.

Duru and Reeb (2002) find that firm size (*SIZE*) likely indicates more complexity and thus greater forecast error, but, at the same time, the availability of more pre-disclosure information by larger firms may lead to lower forecast error. Hwang *et al*. (1996) document that

analysts' forecasts of losses (*LOSS*) are less accurate than their forecasts of profits, and Brown (2001) provides evidence that analysts issue more optimistic forecasts in loss periods. Lang and Lundholm (1996) find that larger changes in earnings (*ΔEARN*) are associated with less accurate forecasts. Prior studies (e.g., Brown 1993) indicate that longer forecast horizons (*HORZ*) are associated with less accurate analysts' earning forecasts. Lys and Soo (1995) find that forecast accuracy increases with the number of financial analysts following the firm (*FOL*), whereas Das *et al*. (1998) suggest less optimistic forecasts for more heavily followed firms. Lang and Lundholm (1996) find that forecast dispersion (*DISP*) is negatively related to analysts' forecast accuracy. Finally, to control for the potential impact of changes in macro economic conditions and industry complexity, throughout the sample period, on analysts' forecasting behavior, we add time-dummies and industry-dummies to regression model (4).

5.2 Earnings per share forecast data

Chinese earnings forecast data were obtained from Investoday Ltd., a leading financial information vendor based in Shenzhen, China. The data consist of *annual* earnings per share forecasts for listed companies covered by Chinese sell-side analysts since 2002. We obtained annual earnings per share forecast data for the three-year period 2002-2004 and merged it with the data described in section IV for our 140 sample firms. This procedure resulted in a reduced sample consisting of a total of 361 firm-year observations representing the 140 firms during the period 2002-2004. Due to the fact that some sample companies were not covered by financial analysts in the early years, the final number of firm-year observations is 361 rather than 420, i.e., 140 times 3.

Panel B of the Appendix shows the correlation coefficients among the variables participating in the analysts' forecasts analysis. As expected, RP sales of goods and services as a percentage of total net sales are associated with less accurate and more optimistic forecasts, consistent with hypothesis H_2. We also find that analysts issue less accurate and more optimistic forecasts in loss firm-years, as does Brown (2001). Similarly to the approach taken in section IV, we calculate the Variance Inflation Factor (VIF) for all OLS regression variables to alleviate concerns about multicollinearity problems among the independent variables. The results of these tests indicate that none of the independent variables has a VIF value that exceeds 3. We conclude, therefore, that no serious multicollinearity problem is present in the regression analysis.

Table 4 presents summary statistics for the variables in regression model (4). We winsorize the observations of each continuous independent variable by half a percent in each tail. The mean and median accuracy (*ACCU*) values are negative by construction. The closer the accuracy value is to zero, the more accurate is the forecast. Thus, variables that are positively related to *ACCU* are associated with more accurate forecasts. Consistent with US analysts' behavior (e.g., Richardson *et al*. 2004), the mean and median signed forecast errors (*BIAS*) are positive, indicating that Chinese analysts are, on the average, optimistic. Variables that are positively related to *BIAS* are associated with more optimistic forecasts. As mean and median consensus forecast data give similar results, we report only the results based on the mean forecasts. Notably, compared with the full sample used in section IV, the reduced sample firms have a lower average ratio of RP sales of goods and services over total net sales (7.49% versus 11.56%) but a higher median ratio (0.46% versus 0.03%). In addition, 13.3% of the reduced sample firms report losses, compared with 8.63% of the full sample. Firm size measured by total assets indicates that the reduced sample is, on the average, larger, probably because its statistics

is based on more recent years. As for the remaining analyst forecasts' control variables, on the average, analysts make their last forecasts about one month (0.967) prior to the actual earnings announcement date; there are five analysts following each sample firm; and forecast dispersion is about 0.5% of stock prices at the forecast date.

[Insert Table 4 here]

5.3 Empirical results

We use pooled ordinary least square (OLS) regressions to estimate model (4). The regression results reported in Table 5 strongly support hypothesis H_2 that financial analysts' earnings forecasts are less accurate and more optimistic for firms with a higher level of RP sales of goods and services. These results are obtained after controlling for previously identified determinants of forecast accuracy and bias. Regression results using forecast accuracy as a dependent variable are presented in the second column and those with forecast bias as a dependent variable in the third column.

Our primary result is that the level of RP sales of goods and services (*RPS*), in the forecast accuracy model, is negatively and significantly associated with forecast accuracy ($\hat{\alpha}_1$ is -0.003, significant at the 5% level), indicating that analysts provide less accurate forecasts for firms that have a higher level of sales of goods and services with their related parties. This may suggest that Chinese financial analysts do not adequately account for the adverse impact of RP sales on earnings. Consistent with prior research, the results also show highly significant negative coefficient estimates (*p*-value = 0.001 or lower) for firm losses (*LOSS*), changes in earnings (*ΔEARN*), forecast horizon (*HORZ*) and forecast dispersion (*DISP*), suggesting that

each of these four control variables is associated with less accurate analyst forecasts. Only the coefficient estimates for firm size (*SIZE*) and analyst following (*FOL*) are insignificantly different from zero.

[Insert Table 5 here]

The last column of Table 5 reports the results of model (4) using earnings forecast bias (*BIAS)* as a dependent variable. We find that the level of RP sales (*RPS*) is positively associated with earnings forecast bias ($\hat{\alpha}_1$ = 0.004, significant at the 5% level), This result is consistent with our prediction that financial analysts provide more optimistic earnings forecasts for firms that engage in a higher level of RP sales of goods and services with their related parties. Our interpretation of this finding is that Chinese financial analysts are credulous about RP sales and thus provide more optimistic earnings forecasts. Consistent with prior research, the results also show highly significant positive coefficient estimates (*p*-value = 0.001) for firm losses (*LOSS*), changes in earnings (*ΔEARN*), forecast horizon (*HORZ*) and forecast dispersion (*DISP*), suggesting that each of these four control variables is associated with more optimistic earnings forecasts. Only the coefficient estimates for firm size (*SIZE*) and analyst following (*FOL*) are insignificantly different from zero. These results are also consistent with our earnings prediction accuracy model.

6. SUMMARY AND CONCLUSIONS

Anecdotal evidence suggests that RP transactions impair the representational faithfulness and verifiability of accounting data. Thus, for example, the misreporting of profitability via RP transactions by a former CFO of Enron only became apparent as the firm began to collapse. In this paper we explore whether RP sales of goods and services reduce earnings informativeness to

capital market investors and consequently affect the quality of earnings forecasts by financial analysts. We focus on RP sales of goods and services because they affect accounting earnings more directly than other types of RP transactions such as directors' loans.

Using a random sample of 140 firms from the Shanghai Stock Exchange, we find a significant negative association between the level of RP sales of goods and services and earnings informativeness measured by the earnings response coefficient (ERC), after controlling for other factors known to affect the ERC. Earnings of firms engaged in RP sales are at least 33% less informative than those of other firms. The results are consistent with the contention that RP sales violate the arm's-length assumption for regular transactions and hence reduce the quality of accounting earnings. We also find that financial analysts credulously accept misleading RP sales data and provide less accurate and more optimistic earnings forecasts for firms with more RP sales of goods and services. Overall, our results show that RP sales of goods and services reduce the usefulness of accounting earnings to capital market investors and make it more difficult for financial analysts to provide accurate earnings forecasts.

The paper has, at least, two implications. The results have policy implications for China and other markets with pervasive related party transactions. As outlined in Aharony *et al*. (2010), the Chinese government has been taking actions to minimize the negative impact of related party sales between listed companies and their parent companies. For example, since 2006, the Chinese government has been encouraging unlisted parent companies to take the entire entity public, in order to create a standard-alone listed company rather than a parent-subsidiary group which involves pervasive related party sales. Our results also suggest that financial analysts should not be unduly willing to trust earnings numbers that are contaminated by unreliable related party sales. However, the limitation is that financial analysts cannot observe the quality of

related party sales directly from companies' financial disclosures. Thus they should acquire more private information about related party sales.

APPENDIX: Pearson and Spearman Correlations

Panel A: Correlation coefficients among the variables participating in the earning informativeness analysis [a]

	RET	*EARN*	*ΔEARN*	*RPS*	*LOSS*	*SIZE*	*MBE*	*DEBT*
RET		0.393***	0.173***	0.041	-0.299***	-0.178***	-0.112***	-0.043
		(0.000)	(0.000)	(0.200)	(0.000)	(0.000)	(0.000)	(0.177)
EARN	0.492***		0.612***	0.096***	-0.684***	0.180***	-0.060	0.076**
	(0.000)		(0.000)	(0.003)	(0.000)	(0.000)	(0.058)	(0.017)
ΔEARN	0.305***	0.522***		-0.009	0.476***	-0.011	-0.065**	-0.029
	(0.000)	(0.000)		(0.771)	(0.000)	(0.728)	(0.043)	(0.358)
RPS	0.004	0.031	0.013		-0.059	0.190***	-0.059	0.095***
	(0.900)	(0.326)	(0.684)		(0.064)	(0.000)	(0.063)	(0.003)
LOSS	-0.316***	-0.486***	0.407***	-0.050		-0.131***	0.063**	-0.026
	(0.000)	(0.000)	(0.000)	(0.117)		(0.000)	(0.047)	(0.407)
SIZE	-0.148***	0.195***	-0.020	0.165***	-0.139***		-0.349***	0.219***
	(0.000)	(0.000)	(0.536)	(0.000)	(0.000)		(0.000)	(0.000)
MBE	-0.066**	-0.190***	0.013	-0.051	0.03	-0.375***		-0.066**
	(0.039)	(0.000)	(0.680)	(0.111)	(0.319)	(0.000)		(0.038)
DEBT	-0.043	0.065**	0.014	-0.006	-0.016	0.206***	-0.090***	
	(0.182)	(0.041)	(0.669)	(0.854)	(0.609)	(0.000)	(0.005)	

[a] Based on data for 140 sample firms in the period from 1998 to 2004 (980 firm-year observations).

Panel A reports the correlation matrix for the variables in the regression models (1a) and (1b). The upper (lower) diagonal reports the Pearson (Spearman) correlation coefficients. *p*-values are provided in parentheses. ** and *** denote significance at a level of 5% and 1%, respectively.

Variable definitions:

$RET_{j,t}$ = firm *j*'s 12-month *cumulative* raw stock return over the period beginning 4 months following the end of fiscal year *t*-1 and ending 4 months after fiscal year *t*;

$EARN_{j,t}$ = firm *j*'s net income in year *t*, scaled by the market value of equity as of year-end *t*-1;

$\Delta EARN_{j,t}$ = change in net income between year *t* and *t*-1, scaled by the market value of equity as of year-end *t*-1;

$RPS_{j,t}$ = firm *j*'s sales of goods and services to its related parties for year *t*, scaled by total net sales for year *t*;

$LOSS_{j,t}$ = a dummy variable, equal to one when firm *j*'s net income for year *t* is negative, and zero otherwise;

$SIZE_{j,t}$ = the natural log of firm *j*'s total assets as of year-end *t*;

$MBE_{j,t}$ = the ratio of firm *j*'s market value of equity to book value of equity as of year-end *t;*

$DEBT_{j,t}$ = firm *j*'s leverage, measured as the ratio of firm *j*'s long-term debt to total book value of assets as of year-end *t.*

Panel B: Correlation coefficients among the variables participating in the analysts' earnings forecast analysis [a]

	ACCU	*BIAS*	*RPS*	*SIZE*	*LOSS*	*ΔEARN*	*HORZ*	*FOL*	*DISP*
ACCU		-0.491***	-0.131**	0.152**	-0.573***	0.359***	-0.096	0.288***	0.050
		(0.000)	(0.041)	(0.016)	(0.000)	(0.000)	(0.131)	(0.000)	(0.429)
BIAS	-0.967***		0.126**	-0.029	0.583***	-0.622***	0.059	-0.138**	-0.080
	(0.000)		(0.050)	(0.646)	(0.000)	(0.000)	(0.352)	(0.029)	(0.210)
RPS	-0.289***	0.330***		0.134**	-0.045	0.073	-0.003	0.095	0.022
	(0.002)	(0.000)		(0.034)	(0.483)	(0.252)	(0.964)	(0.134)	(0.735)
SIZE	0.189***	-0.175***	0.124		-0.291***	0.106	-0.135**	0.508***	0.394***
	(0.003)	(0.006)	(0.051)		(0.000)	(0.094)	(0.033)	(0.000)	(0.000)
LOSS	-0.674***	0.668*	-0.023	-0.297***		-0.547***	-0.073	-0.372***	-0.242***
	(0.000)	(0.000)	(0.718)	(0.000)		(0.000)	(0.249)	(0.000)	(0.000)
ΔEARN	0.688***	-0.720***	-0.021	0.086	-0.620***		0.011	0.205***	0.143**
	(0.000)	(0.000)	(0.731)	(0.176)	(0.000)		(0.858)	(0.001)	(0.023)
HORZ	-0.072	0.078	0.061	-0.139**	-0.076	0.044		-0.112	-0.032
	(0.257)	(0.218)	(0.335)	(0.028)	(0.229)	(0.490)		(0.078)	(0.617)
FOL	0.181	-0.160**	0.097	0.486***	-0.254***	0.151**	-0.106		0.707***
	(0.004)	(0.012)	(0.124)	(0.000)	(0.000)	(0.017)	(0.095)		(0.000)
DISP	-0.209***	0.173***	0.056	0.111	0.014	0.017	-0.009	0.174***	
	(0.001)	(0.006)	(0.382)	(0.081)	(0.829)	(0.791)	(0.885)	(0.006)	

[a] Based on data for 140 sample firms in the period from 2002 to 2004 (361 firm-year observations).

Panel B reports the correlation matrix for the variables in the regression model (4). The upper (lower) diagonal reports the Pearson (Spearman) correlation coefficients. *p*-values are provided in parentheses. ** and *** denote significance at a level of 5% and 1%, respectively.

Variable definitions:

$ACCU_{j,t}$ = firm *j*'s earnings forecast accuracy in year *t* as defined by Eq (2);
$BIAS_{j,t}$ = firm j's earnings forecast bias in year *t* as defined by Eq (3);
$RPS_{j,t}$ = firm *j*'s sales of goods and services to its related parties, scaled by total net sales in year *t*;
$SIZE_{j,t}$ = the natural log of firm *j*'s total assets as of year-end *t*;
$LOSS_{j,t}$ = a dummy variable, equal to one when firm *j*'s net income for year *t* is negative, and zero otherwise;
$\Delta EARN_{j,t}$ = change in net income between year *t* and *t*-1, scaled by the market value of equity as of year-end *t*-1;
$HORZ_{j,t}$ = firm *j*'s forecast horizon in year *t*, expressed as the number of months between the forecast month and the end of fiscal year *t*;
$FOL_{j,t}$ = number of financial analysts following firm *j* in year *t*;
$DISP_{j,t}$ = financial analysts' forecast dispersion, measured as the standard deviation of firm *j*'s analysts' forecasts in year *t* deflated by the stock price per share at the forecast date.

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TABLE 1
Sample Firm Composition by Industry

Industry	Two-digit SIC Code	Number of Sample Firms	Percentage of Total Population [a]	Median Total Assets of Sample Firms as of 12.31.1998 (million RMB)	Median Total Assets of Total Population as of 12.31.1998 (million RMB)
Food and tobacco	1, 2, 9, 20, 21, 54	16	28% (57)	740.58	841.48
Basic industries including petroleum	10, 12, 13, 14, 24, 26, 28, 29, 33	22	34% (64)	682.16	706.00
Construction	15, 16, 17, 32, 52	28	35% (79)	1,076.57	837.22
Textiles and trade	22, 23, 31, 51, 53, 56, 59	5	33% (15)	1,307.51	796.91
Consumer durables	25, 30, 36, 37, 39, 50, 55, 57	23	29% (78)	1,031.70	1047.58
Capital goods	34, 35, 38	7	35% (20)	928.10	934.44
Transportation	40, 41, 42, 44, 45, 47	9	53% (17)	910.99	785.52
Services	72, 73 75, 76, 80, 82, 87, 89	25	76% (33)	787.52	949.87
Conglomerate	No specific SIC code	5	25% (20)	877.67	938.73
Entire sample		**140**	**37% (383)**	**901.33**	**881.63**

[a] The number of listed firms in the entire population per industry is in parentheses.

The table shows the sample composition of 140 firms randomly selected from the entire population of 383 firms listed on the Shanghai Stock Exchange in 1997, classified by nine major industries (two-digit SIC code). The industry classification is based on Campbell (1996). As the number of firms in the petroleum industries (SIC code 13, 29) is small, we combine them with the basic industries. The sample excludes the utility industries (SIC code 46, 48, 49) and the financial services industries (SIC 60-69).

TABLE 2
Summary Statistics for the Variables in Regression Models (1a) and (1b) [a]

Variable	Mean	Median	Std. Dev.	Mean Values for the 243 Non-sample Firms [b]
12-month stock return (RET)	0.1178	0.0140	0.5035	0.0935
Earnings as % of market value (EARN)	1.68%	1.93%	3.59%	1.95%
ΔEarnings as % of market value (ΔEARN)	0.00%	-0.05%	3.61%	0.00%
RP sales as % of total net sales (RPS)	11.56%	0.03%	20.05%	NA[c]
% RP sales > 0	51.47%	--	--	NA
Total RP sales (million RMB)	141.70	0.28	627.30	NA
Total net sales (million RMB)	1,213.93	599.65	1,648.67	1,169.78
% Earnings < 0 (LOSS)	8.63%	--	--	9.58%
Total assets (million RMB)	2,002.77	1,285.52	2,210.20	2,313.83
Market-to-book ratio (MBE)	3.90	3.38	2.39	4.33
Long-term debt as % of total assets (DEBT)	7.75%	2.74%	11.18%	7.15%
Equity market value (million RMB)	3,110.28	2,369.61	2,860.71	3310.23

[a] Based on data for 140 sample firms in the period from 1998 to 2004 (980 firm-year observations).
[b] The entire population of 343 firms less our 140 sample firms.
[c] Not Available.

Variable definitions: *12-month stock return* (RET) is firm *j*'s stock return for year *t*, beginning four months following the end of year *t*-1 and ending four months after the end of year *t; Earnings as % of market value* (EARN) is firm *j*'s net income (before extraordinary items) in year *t* scaled by its market value of equity as of year-end *t* -1; *ΔEarnings as % of market value* (ΔEARN) is firm *j*'s net income in year *t* minus net income in year *t* -1, scaled by its market value of equity as of year-end *t* -1; *RP sales as % of total net sales* (RPS) is firm *j*'s sales of goods and services to its related parties in year *t*, scaled by its total net sales in year *t*; *% RP sales >0* is the percentage of firms with RP sales greater than zero in year *t*; *Total RP sales* is firm *j*'s total sales of goods and services to its related parties in year *t*; *Total net sales* is firm *j*'s total sales revenue net of sales allowance, sales discount, and sales returns in year *t*; *% Earnings < 0* (LOSS) is the percentage of firms with reported negative net income in year *t*; *Total assets* is firm *j*'s total book value of assets as of year-end *t*; *Market-to-book ratio* (MBE) is the ratio of firm *j*'s market value of equity to book value of equity as of year-end *t*; *Long-term debt as % total assets* (DEBT) is the ratio of firm *j*'s long-term debt to total book value of assets as of year-end *t*; *Equity market value* is firm *j*'s closing price as of year-end *t* times total number of outstanding common shares as of year-end *t*.

TABLE 3
The Impact of Related Party Sales on Earnings Informativeness – Regression Results of Models (1a) and (1b) [a]

Variable (coefficient)	Pooled Regressions		Two-Way Fixed Effects Regressions	
	Model (1a)	Model (1b)	Model (1a)	Model (1b)
Intercept ($\hat{\alpha}_0$)	-0.122***	-0.114	-0.354***	-0.345***
	(0.000)	(0.000)	(0.003)	(0.003)
EARN ($\hat{\alpha}_1$)	5.747***	7.975***	3.637***	4.749***
	(0.001)	(0.000)	(0.004)	(0.002)
*EARN*RPS* ($\hat{\alpha}_2$)	-2.501***	-2.772***	-1.640***	-2.072***
	(0.001)	(0.002)	(0.008)	(0.007)
ΔEARN ($\hat{\alpha}_3$)		3.781**		2.400
		(0.048)		(0.090)
*ΔEARN*RPS* ($\hat{\alpha}_4$)		-1.161		-1.324
		(0.312)		(0.122)
*EARN*LOSS* ($\hat{\beta}_1$)	-8.798***	-8.392***	-11.535***	-9.004***
	(0.000)	(0.000)	(0.000)	(0.000)
*EARN*SIZE* ($\hat{\beta}_2$)	0.177	0.109	0.500***	0.466***
	(0.053)	(0.303)	(0.000)	(0.000)
*EARN*MBE* ($\hat{\beta}_3$)	1.063***	0.875***	-0.457***	-0.911***
	(0.000)	(0.003)	(0.038)	(0.001)
*EARN*DEBT* ($\hat{\beta}_4$)	-13.234**	-17.337***	-4.997	-3.369
	(0.012)	(0.005)	(0.313)	(0.574)
*ΔEARN*LOSS* ($\hat{\gamma}_1$)		0.084		3.587**
		(0.970)		(0.032)
*ΔEARN*SIZE* ($\hat{\gamma}_2$)		-0.065		-0.074
		(0.526)		(0.330)
*ΔEARN*MBE* ($\hat{\gamma}_3$)		-0.358		-0.623**
		(0.303)		(0.018)
*ΔEARN*DEBT* ($\hat{\gamma}_4$)		-12.122		0.217
		(0.219)		(0.976)
Two-way fixed effects (firm and time dummies)	Not included	Not included	Included	Included
No. of observations	980	980	980	980
Adj. R-square	0.221	0.221	0.697	0.706
*EARN*RPS* + *ΔEARN*RPS*		-3.933**		-3.396**
($\hat{\alpha}_2 + \hat{\alpha}_4$)		(0.030)		(0.019)

[a] Based on data for 980 firm-year observations (140 sample firms for the seven-year period from 1998 to 2004).

The table reports the results for regression models (1a) and (1b):

$$RET_{j,t} = \alpha_0 + \alpha_1 EARN_{j,t} + \alpha_2 EARN_{j,t} * RPS_{j,t} + \sum_{k=1}^{4} \beta_k EARN_{j,t} * CON_{j,t}^{k} + \varepsilon_{j,t}, \quad (1a)$$

$$RET_{j,t} = \alpha_0 + \alpha_1 EARN_{j,t} + \alpha_2 EARN_{j,t} * RPS_{j,t} + \alpha_3 \Delta EARN_{j,t} + \alpha_4 \Delta EARN_{j,t} * RPS_{j,t}$$

$$+ \sum_{k=1}^{4} \beta_k EARN_{j,t} * CON_{j,t}^{k} + \sum_{k=1}^{4} \gamma_k \Delta EARN_{j,t} * CON_{j,t}^{k} + \upsilon_{j,t}, \qquad (1b)$$

Variable definitions: *RET* is firm *j*'s 12-month stock return for year *t*, beginning four months following the end of year *t*-1 and ending four months after the end of year *t; EARN* is firm *j*'s net income (before extraordinary items) in year *t* scaled by its market value of equity as of year-end *t* -1; *ΔEARN* is firm *j*'s net income in year *t* minus net income in year *t* -1, scaled by its market value of equity as of year-end *t* -1; *RPS* is firm *j*'s sales of goods and services to its related parties in year *t*, scaled by its total net sales in year *t*; *LOSS* takes value of one if EARN is positive and zero otherwise; *SIZE* is the natural log of firm *j*'s total assets in year *t*; *MBE* is the ratio of firm *j*'s market value of equity to book value of equity as of year-end *t*; *DEBT* is the ratio of firm *j*'s long-term debt to total book value of assets as of year-end *t*; *p*-values are reported in parentheses. ** and *** denote two-tailed significance at the 5% and 1% level, respectively.

TABLE 4
Summary Statistics for the Variables in Regression Model (4) [a]

Variables	Mean	Median	Std. Dev.
Mean consensus forecast (*FORECAST*)	0.144	0.125	0.220
Median consensus forecast (*FORECAST*)	0.144	0.124	0.220
Forecast accuracy (*ACCU*)	-0.014	-0.005	0.029
Forecast bias (*BIAS*)	0.010	0.002	0.030
RP sales as % of total net sales (*RPS*)	7.49%	0.46%	17.61%
% of Earnings < 0 (*LOSS*)	13.3%	--	--
Total assets (million RMB)	2,809.66	1,875.68	3,004.23
Earnings changes as % of market value ($\Delta EARN$)	0.01%	0.05%	5.05%
Forecast horizon (*HORZ*)	0.967	0.500	2.938
Number of analysts following (*FOL*)	5.125	3.000	6.160
Forecast dispersion (*DISP*)	0.005	0.002	0.009

[a] Based on data for 140 sample firms in the period from 2002 to 2004 (361 firm-year observations).

Variable definitions: mean (median) consensus forecast (*FORECAST*) is analysts' forecast of annual earnings of Chinese firms; forecast accuracy (*ACCU*) is firm *j*'s earnings forecast accuracy in year t as defined by Eq (2); forecast bias (*BIAS*) is firm *j*'s earnings forecast bias in year *t* as defined by Eq (3); related party sales (*RPS*) is firm *j*'s sales of goods and services to its related parties, scaled by total net sales in fiscal year *t*; firm size (*SIZE*) is the natural log of firm *j*'s total assets as of year-end *t*; loss firm-years (*LOSS*) is a dummy variable, equal to one when firm *j*'s net earnings for year *t* are negative, and zero otherwise; earnings changes ($\Delta EARN$) is change in $EARN_{j,t}$ between year *t-1* and *t*, scaled by market value of equity as of year-end *t*-1; forecast horizon (*HORZ*) is firm *j*'s forecast horizon in year *t*, expressed as the number of months between the forecast month and the end of year *t*; number of analysts following (*FOL*) is the number of financial analysts following firm *j* in year *t*; forecast dispersion (*DISP*) is the analysts' forecast dispersion, measured as the standard deviation of firm *j*'s analysts' forecasts in year *t* deflated by the stock price per share at the forecast date.

Table 5
The Impact of Related Party Sales on Analysts' Earnings Forecast Accuracy – Regression Results of Model (4) [a]

Variable (coefficient)	Forecast Accuracy (ACCU)	Forecast Bias (BIAS)
Intercept ($\hat{\alpha}_0$)	-0.030	0.020
	(0.658)	(0.342)
RPS ($\hat{\alpha}_1$)	-0.003**	0.004**
	(0.025)	(0.043)
SIZE ($\hat{\alpha}_2$)	0.001	-0.001
	(0.536)	(0.365)
LOSS ($\hat{\alpha}_3$)	-0.028***	0.030***
	(0.000)	(0.000)
ΔEARN ($\hat{\alpha}_4$)	-0.302***	0.337***
	(0.000)	(0.000)
HORZ ($\hat{\alpha}_5$)	-0.001***	0.001***
	(0.001)	(0.000)
FOL ($\hat{\alpha}_6$)	0.000	0.000
	(0.756)	(0.936)
DISP ($\hat{\alpha}_7$)	-0.744***	0.623***
	(0.000)	(0.000)
Time dummies	Included	Included
Industry dummies	Included	Included
No. of observations	361	361
Adj. R-square	0.628	0.657

[a] Based on data for 361 firm-year observations (140 sample firms with earnings forecasts available from 2002 to 2004.

The table reports the results for regression equation (4):

$$ACCU_{j,t}(BIAS_{j,t}) = \alpha_0 + \alpha_1 RPS_{j,t} + \alpha_2 SIZE_{j,t} + \alpha_3 LOSS_{j,t} + \alpha_4 \Delta EARN_{j,t} + \alpha_5 HORZ_{j,t}$$

$$+ \alpha_6 FOL_{j,t} + \alpha_7 DISP_{j,t} + TimeDummies + IndustryDummies + \varepsilon_{j,t},$$

Variable definitions: forecast accuracy (*ACCU*) is firm *j*'s earnings forecast accuracy in year t as defined by Eq (2); forecast bias (*BIAS*) is firm j's earnings forecast bias in year t as defined by Eq (3); *RPS* is firm *j*'s sales of goods and services to its related parties, scaled by total net sales in fiscal year *t*; *SIZE* is the natural log of firm *j*'s total assets as of year-end *t*; *LOSS* is a dummy variable, equal to one when firm *j*'s earnings ($EARN_{j,t}$) for year *t* are negative, and zero otherwise; *ΔEARN* is the change in $EARN_{j,t}$ between year *t-1 and t*, scaled by the market value of equity as of year-end *t*-1; *HORZ* is firm j's forecast horizon in year t, expressed as the number of months between the forecast month and the end of year t; *FOL* is number of financial analysts following firm *j* in year *t*; *DISP* is the analysts' forecast dispersion, measured as the standard deviation of firm *j*'s analysts' forecasts in year *t* deflated by the stock price per share at the forecast date. *p* values are reported in parentheses. ** and *** denote significance at a level of 5% and 1%, respectively.