Dividend from subsidiaries and the agency cost of business groups

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**ABSTRACT**

The subsidiary’s profit distribution results in the cash transfer from the subsidiary to the parent company. We investigate the effect of this cash transfer on the business group’s agency cost. Using the sample of A-share listed companies in China from 2006 to 2017, we find that the profits distributed by subsidiaries lead to the decrease of the agency costs of the business group as a whole. The channel analysis reveals that the profits are transferred to parent company whose governance efficiency is relatively higher and the total free cash flows are reduced. Further research finds that the agency cost reduced effect is more significant in business groups with higher subsidiary business importance and subsidiary debt financing importance, and in groups with lower growth of the subsidiary. Finally, we report that the subsidiary’s profit distribution has value-added effect. This paper generates new insights into the “black box” of the internal operation of business groups and provides comprehensive implications for policy makers.

**KEYWORDS**
Dividend from subsidiaries; agency costs; the governance of business groups

1. Introduction

Business groups which consist of legally independent companies are popular in emerging markets (Belenzon & Berkovitz, 2010; Khanna & Palepu, 1997). Compared to an independent company, a business group not only has the more complex control chain but also faces severe intergroup games. In the study of business group governance, existing literature mainly focuses on how to alleviate the agency problem between shareholders and management, as well as that between controlling shareholders and small ones (Faccio et al., 2001; La Porta et al., 2000). In addition, a little research attempt to open the “black box” of business groups and examine the agency problems between parent and subsidiaries. Lu and Zhang (2010) analyse from the perspective of major shareholder supervision and find that the major shareholders restrain the self-interest activities of subsidiary’s managers. Qian and Wu (2016) point that state-owned enterprises could benefit from the decrease of management layers.
Cash reserves are easily accessible and much of their use is discretionary (Dittmar & Mahrt-Smith, 2007). Scholars also try to figure out how the distribution of cash within a business group affects governance efficiency. Zhang and Wu (2011) report that the excess cash held by subsidiaries could have a negative impact on corporate operating performance. It is worth mentioning that the profit distribution of subsidiaries is an important channel to affect the cash distribution in business groups. Will the profit distribution of subsidiaries affects the overall governance efficiency of the business group? Far too little attention has been paid to this issue since of the limitation of data accessibility. In this paper, we try to investigate the effect of the profit distribution of subsidiaries on the group’s agency cost in China’s setting.

The China’s capital market has several important advantages for our purposes. First, the listed companies in China report both parent-only and consolidated financial statements, which is different from the unique disclosure practice in the USA and Canada. Second, the execution of the new accounting standard for investment in 2007 gave us a chance to collect information about the profit distribution of subsidiaries which is reported in the investment profit.1 According to data in this paper, 55% of the observation obtained profits from their subsidiaries, accounting for about 17% of the cash owned by the groups. Apparently, the profit distribution of subsidiaries will materially affect the cash distribution between the parent and subsidiaries.

Using detailed information on the profit distribution of subsidiaries in China’s stock market from 2006 to 2017, we attempt to examine the impact of subsidiary profit distribution on the agency cost of the business group. The results show that the more profits of the subsidiaries are distributed, the lower the agency costs of the business group as a whole. The above conclusions remain unchanged under a variety of robustness tests.

We empirically examine two plausible mechanisms from the perspective of relative change of agency costs between the parent company and the subsidiaries, and free cash flow of the business group. Specifically: (1) When the cash is transferred from subsidiaries to parents by profit distribution, the decrease of agency costs of subsidiaries is more than the increase of those in parent, thereby reducing the overall agency costs of the business group; (2) Part of the cash is received by non-controlling interest, leading to the reduction of total cash owned by the group. Finally, we provide evidence that the negative relationship between the distribution of subsidiary profits and the overall agency cost of the business group is more significant when the subsidiary has a higher degree of business importance, a higher degree of debt financing importance, and a lower level of growth. In addition, we find that the profit distribution of subsidiaries can increase the value of the business group, and this improvement effect is more significant when the overall agency cost of the business group is higher.

We make the following contributions. First, the existing literature, considering how to alleviate agency problems in business groups, has studied from the perspectives of major shareholder supervision, management layer, and parent-subsidiary personnel embedding

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1After the implementation of the new accounting standards in 2007, it is stipulated that the “cost method” should be adopted for long-term equity investment in subsidiaries, and the parent company will recognise the investment income accordingly when the profits of subsidiaries are distributed back to the parent company. Therefore, through the collection and collation of investment income detail items in the parent company’s report, the profit data of the subsidiary can be obtained.
(Kawai & Strange, 2014; Lu & Zhang, 2010; Qian & Wu, 2016; Zheng & Chen, 2018). Much less is known about the governance effect of subsidiary’s profit distribution. We provide a new research perspective for business group governance and also enrich the academic literature in this field. Second, due to the data availability, most of the existing studies on the profit distribution of subsidiaries are based on the operation of multinational business groups (Desai et al., 2007). Based on the detailed information provided by the ‘dual disclosure system’ in the Chinese capital market, we reveal the governance effect of the subsidiaries’ profit distribution. The research conclusions are more reliable and generalisable and have reference value for future related research. Third, the conclusions help to reveal the specific operating mechanism in the “black box” of the internal capital market.

The rest of this paper is arranged as follows: Section two is the literature review and hypothesis development. Section three is the research design. We report the empirical results in Section four. The fifth and sixth parts are the mechanism tests and supplementary analysis, respectively. The final part concludes the paper.

2. Literature review and hypothesis development

Cash dividends to shareholders reduce the cash under managers’ control, thereby weakening managers’ authority. So, the ‘free cash flow hypothesis’ supposes that managers have a strong incentive to over-investment and perk consumption (Jensen, 1986). What will happen in the business group if the subsidiaries have abundant cash? Kostova et al. (2018) find that due to self-interest and bounded rationality, the objectives of the subsidiary managers are not always the same as those of the shareholders, which will lead to higher agency problems between the managers and the shareholders. The managers of a specific subsidiary could exaggerate project return to win more resources. In this case, the subsidiary often obtains funds beyond the normal business needs, which leads to agency problems such as over-investment (Ozbas, 2005; Scharfstein & Stein, 2000; Wulf, 2009). Harford et al. (2017) show that the more cash owned by overseas subsidiaries is, the less the business group value is. This evidence indirectly shows that the excessive cash held by overseas subsidiaries leads to serious agency problems, which are the results of subsidiaries’ over-investment. Lu and Zhang (2010) conduct a study on business groups in China’s capital market and find that compared with business groups with lower levels of cash held by subsidiaries, business groups with higher levels of cash held by subsidiaries have significantly lower cash holding value. Zhang and Wu (2011) also find a similar conclusion based on the examination of the influence of cash distribution of subsidiaries on the group’s financial performance. More directly, Zhang and Lu (2012) explore the logic behind the influence of cash distribution of subsidiaries on corporate value and conclude that excessive cash held by subsidiaries would lead to business groups’ over-investment. Similar studies are conducted by Cheng et al. (2020).

Then, how to alleviate the agency problem caused by excessive cash holding by subsidiaries in business groups? Existing literature shows that supervision by major shareholders, design of management hierarchy, and embedding of staff in subsidiary companies can alleviate the agency problems caused by excessive cash holdings of subsidiaries (Kawai & Strange, 2014; Lu & Zhang, 2010; Qian & Wu, 2016; Zheng & Chen, 2018). Profit distribution of the subsidiaries is an important way to allocate resources in the internal capital market of the business group, which can reduce the level of cash held
by subsidiaries. In addition, the cash dividend is an important mechanism to solve the agency problem (La Porta et al., 2000). How do the subsidiary dividends affect the parent company’s, subsidiaries’ and the overall group’s agency costs? This is an interesting empirical question.

If minority shareholders, taxes, transfer costs, and other factors are considered, the distribution of subsidiary profits to the parent company will reduce the funds that can be controlled by the business group as a whole, which will have an impact on the overall governance efficiency of the business group. If these factors are excluded, the distribution of subsidiary profits only transfers the funds from the group’s “left pocket” to the “right pocket”. However, it does not mean that the overall governance efficiency of the business group will not change. Because the profit distribution of subsidiaries not only reduces the cash owned by subsidiaries but also improves that of the parent company. Under the framework of multi-layer principal–agent relationship between shareholders, parent company and subsidiaries, according to the theoretical expectation of free cash flow hypothesis (Jensen, 1986), reducing the cash holding level of subsidiaries can inhibit the opportunistic behaviour of the managers in subsidiaries, while the increase of cash in the parent company may lead to more agency costs. Of course, in the extreme cases, assuming that the governance efficiency of parent company and subsidiary company is the same, and the process of profit distribution by subsidiary company will not lead to the reduction of the overall funds of the business group, the profit distribution by subsidiary company will have no influence on the agency cost of the business group as a whole, nor will it have any governance effect. In practice, the governance efficiency differs greatly among different firms. Therefore, how the profit distribution of subsidiaries affects the overall agency cost of the business group depends on the difference in the governance efficiency of the parent and the subsidiary. We propose that the profit distribution of subsidiaries reduces the agency costs of the business group. The reasons are as follows.

First, according to the expectations of the free cash flow theory, the profit distribution of subsidiaries will lead to the decrease in the agency costs of the subsidiaries, while the parent company holds more free cash flow, causing its agency costs to rise. Does the agency cost of the business group increase or decrease? We try to answer this question from the perspective of shareholder supervision and social supervision.

The parent company in the business group is subject to stronger shareholder supervision and social supervision. The decrease of the agency cost of subsidiary company is greater than the increase of agency cost of parent company. Therefore, the overall agency cost of the business group is reduced. Specifically, in terms of shareholder supervision, shareholders of business groups have a strong incentive to supervise the managers of parent and subsidiary companies because of the large amount of assets exposed to risk (Del Guercio & Hawkins, 1999; Denis et al., 1997; Gillan & Starks, 2000; Gompers & Metrick, 2001). However, from the perspective of the multi-layer principal–agent relationship, the increase of control chain worse the information environment since of the increase of organisational hierarchy. It is more difficult for shareholders of the group to supervise the managers in the subsidiary company. Managers in subsidiaries are more likely to misuse the cash since of the lack of strong governance from group shareholders (Lu & Zhang, 2010). In addition, the increased control chain may lead to an increase in the geographical distance between the parent company and its subsidiaries of the business group, and make subsidiaries’ opportunistic behaviours more unscrupulous. Therefore, compared
with subsidiaries, shareholders have a stronger ability to supervise the parent company rather than subsidiaries. From the view of social supervision, compared with its subsidiaries, the parent company of the business group has higher social exposure and visibility. It means that the parent is subject to stronger social supervision such as media reports, analyst following, and so on, leading to the higher transparency of the parent company than that of its subsidiaries (Geng & Wang, 2016; Hu et al., 2020; Li & Shen, 2010; Zhou et al., 2016; Yang, Cao, et al., 2020). The exposure risks in the process of seeking private interests are higher for managers in the parent company, and then the opportunistic behaviours decrease. In short, from the perspective of shareholder supervision and social supervision, when the subsidiary distributes its profits, the increase of agency costs in the parent company is less than the decrease of that in subsidiaries. Therefore, the subsidiary’s profits distribution will ultimately reduce the agency costs of the business group.

Second, there may be minority shareholders in the subsidiaries of business groups. According to data in this paper, almost 87% of the firm has non-controlling interest. The existence of minority shareholders is a common phenomenon in practice, which means that when subsidiaries distribute dividends, some profits will flow out of the business group. In addition to minority shareholders, factors such as taxes and transfer costs may also reduce the resources that the business group can control in the process of profit distribution. According to the free cash flow hypothesis (Jensen, 1986), the profit distribution of subsidiaries will reduce the actual controllable resources of the group. In other words, the profit distribution of subsidiaries may reduce the idle funds of business groups and then weaken the power of the business groups’ managers to a certain extent. This behaviour could inhibit the opportunities for excessive investment, perk consumption, and other behaviours that damage the interests of shareholders (Rozeff, 1982; Tang et al., 2007; Liu & Zhang, 2012; Yang, Chen, et al., 2020).

Based on the above analysis, the profit distribution of subsidiaries can alleviate the agency costs and improve the governance efficiency of the business group. Therefore, the following hypothesis is proposed.

Hypothesis 1: The more profits the subsidiaries distribute, the lower the overall agency cost of the business group.

3. Research design

3.1. Data source and sample selection

This paper selects Chinese A-share listed companies from 2006 to 2017 as the initial sample. The data of the subsidiary profit distribution is manually collected from the financial report note about ‘investment income’ in the parent company’s report. We

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2Listed companies began to implement the new “Accounting Standards for Business Enterprises” in 2007. The new standards changed the accounting method of investments for subsidiaries. In the individual statements of the parent company, the “equity method” was changed to the “cost method”. Under the “cost method”, the parent company recognises the investment income accordingly when it receives the cash dividends from subsidiaries. This also makes it possible to judge and collect the subsidiary profit distribution data through the detailed information in the parent company’s investment income notes. Since the note of investment income discloses the corresponding data in the current and previous period, the starting year of the sample in this article is 2006.
obtain most of the financial data from the China Stock Market and Accounting Research Database (CSMAR) and impose the following requirements: (1) excluding companies in the financial industry; (2) excluding companies without any subsidiary; (3) excluding companies with missing data. We eventually obtain a total of 22,033 company-year observations in the final sample. It should be noted that in order to alleviate the possible effects of the extreme values, all continuous variables are winsorised at the 1st and 99th percentiles.

3.2. Model design and variable definition

In order to verify the hypothesis 1, drawing on the existing literature, this paper constructs the following regression model:

\[
AC_{it} = \alpha + \beta_1 SDIV_{it} + \beta_2 SAR_{it} + \beta_3 SIZE_{it} + \beta_4 LEV_{it} + \beta_5 OCFA_{it} + \beta_6 SGTH_{it} + \beta_7 AGE_{it} \\
+ \beta_8 SHRRCR_{it} + \beta_9 BOARD_{it} + \beta_{10} BI_{it} + \beta_{11} CEOCHR_{it} + \beta_{12} MGT_{it} + \gamma_i + \mu_t + \epsilon_{it}
\]

The dependent variable is \( AC \), representing the agent costs of the business group. Following Ang et al. (2000) and Li (2007), we measure \( AC \) by the management expense ratio (\( MFR \)) and total asset turnover ratio (\( TO \)). The larger (smaller) the management expense ratio (total asset turnover ratio) is, the higher the agency costs of the business group are.\(^3\)

The variable of \( SDIV \) is the subsidiary profit distribution which is measured by the ratio of the subsidiary profit distribution to the total assets in the consolidated statements. According to hypothesis 1, \( \beta_1 \) should be significantly negative (positive) when using the management expense ratio (the total asset turnover ratio) to measure agency cost.

We include a set of control variables in Model (1). These are the proportion of business operated by subsidiaries (\( SAR \)), size (\( SIZE \)), leverage level (\( LEV \)), cash flow level of operating activities (\( OCFA \)), growth (\( SGTH \)), age (\( AGE \)), shareholding ratio of the largest shareholder (\( SHRRCR \)), the size of the board of directors (\( BOARD \)), the proportion of independent directors (\( BI \)), whether the chairman and CEO are the same person (\( CEOCHR \)) and the shareholding ratio of managers (\( MGT \)). In addition, the model also controls the group and year fixed effects. The detailed variable definition is reported in Table 1.

4. Empirical results

4.1. Descriptive statistics

Table 2 reports the descriptive statistics of the main variables. The average value of the management expense ratio (\( MFR \)) is 0.104 and the standard deviation is 0.097. The average value of the total asset turnover ratio (\( TO \)) is 0.636 and the standard deviation is 0.459. The wide range in values for both measures shows that large variations of agency costs among the sample. So it pays to explore the reason of agency problem in depth.

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\(^3\)It should be noted that since most parent companies do not disclose the dividend level of each subsidiary separately and such information on each subsidiary cannot be obtained through public channels, we follow the method by Lu and Zhang (2010) to treat all subsidiaries as one single represented subsidiary. As a consequence, the distributed profits of the subsidiary are actually the sum of the profits distributed to the parent company by all the subsidiaries of the listed company.
Table 1. Variable definition.

| Variables | Variable definitions |
|-----------|----------------------|
| MFR       | The ratio of the business group’s management expenses to operating income. |
| TO        | The ratio of the business group’s sales to total assets. |
| SDIV      | Subsidiary’s profit distributed to the parent company, scaled by total assets in the consolidated statements. |
| SAR       | Total assets of subsidiaries, scaled by the total assets in the consolidated statements. |

4In order to avoid the influence of elimination of intergroup transaction, following Liu et al. (2015) we calculate the total assets of subsidiaries as below. Total assets of subsidiaries = total assets of consolidated statements – total assets of parent statements + long-term equity investment of parent statements – long-term equity investment of consolidated statements.

| Variables | Definition |
|-----------|------------|
| SIZE      | The natural logarithm of total assets. |
| LEV       | The total liabilities divided by the total assets in the consolidated statement. |
| OCF        | The operating cash flow, scaled by the total assets in the consolidated statements. |
| SGTH      | The sales growth, calculated as the percentage change in sales revenue. |
| AGE       | The natural logarithm of the sum of the years that a company listed on the stock exchange and 1. |
| SHRCR     | The percentage of shares owned by the largest shareholder. |
| BOARD     | The total number of board members. |
| BI        | The percentage of independent directors on a board. |
| CEOCHR    | If one person concurrently serves as chairman and CEO, the value is 1 and 0 otherwise. |
| MGT       | The percentage of shares owned by managers. |
| \( \gamma_i \) | Group level fixed-effect. |
| \( \mu_t \) | Year level fixed-effect. |

Table 2. Descriptive statistics.

| Variables | N | Mean | STD. | Min. | Median | Max. |
|-----------|---|------|------|------|--------|------|
| MFR       | 22003 | 0.104 | 0.097 | 0.009 | 0.081 | 0.663 |
| TO        | 22003 | 0.636 | 0.459 | 0.053 | 0.527 | 2.610 |
| SDIV      | 22003 | 0.009 | 0.019 | 0.000 | 0.000 | 0.112 |
| SAR       | 22003 | 0.412 | 0.268 | 0.000 | 0.398 | 0.974 |
| SIZE      | 22003 | 21.964 | 1.271 | 19.259 | 21.808 | 25.800 |
| LEV       | 22003 | 0.458 | 0.217 | 0.054 | 0.457 | 1.030 |
| OCF       | 22003 | 0.042 | 0.076 | -0.198 | 0.041 | 0.253 |
| SGTH      | 22003 | 0.227 | 0.595 | -0.617 | 0.122 | 4.297 |
| AGE       | 22003 | 10.776 | 6.270 | 1.000 | 10.000 | 24.000 |
| SHRCR     | 22003 | 0.349 | 0.150 | 0.085 | 0.330 | 0.743 |
| BOARD     | 22003 | 8.813 | 1.754 | 5.000 | 9.000 | 15.000 |
| BI        | 22003 | 0.370 | 0.052 | 0.300 | 0.333 | 0.571 |
| CEOCHR    | 22003 | 0.230 | 0.421 | 0.000 | 0.000 | 1.000 |
| MGT       | 22003 | 0.102 | 0.183 | 0.000 | 0.000 | 0.673 |

Subsidiary profit distribution level (SDIV) varies from 0.000 to 0.112, with the mean value of 0.009 and the standard deviation of 0.019, also reflecting the significant difference in the subsidiary profits distribution practices.

4In order to avoid the influence of elimination of intergroup transaction, following Liu et al. (2015) we calculate the total assets of subsidiaries as below. Total assets of subsidiaries = total assets of consolidated statements – total assets of parent statements + long-term equity investment of parent statements – long-term equity investment of consolidated statements.

4.2. Basic test results

Table 3 provides evidence for the impact of the distribution of subsidiary profits on the agency costs of the business group. The dependent variables of Columns (1) and (2) are management expense ratio (MFR). The dependent variables of Columns (3) and (4) are the
Table 3. The test results of the relationship between the profit distribution of subsidiary and the overall agency cost of business group.

| Variable | MFR (1) | MFR (2) | TO (3) | TO (4) |
|----------|---------|---------|--------|--------|
| SDIV | −0.170*** | −0.082*** | 0.828*** | 0.945*** |
| SAR | −0.011*** | −0.350 | 0.063*** | 5.60 |
| SIZE | −0.025*** | −24.30 | −0.103*** | −28.34 |
| LEV | 0.044*** | 11.59 | 0.087*** | 6.43 |
| OCFA | 0.828*** | 0.339*** |
| SGTH | 0.085*** |
| AGE | 0.012*** | 4.10 | 0.001 | 0.09 |
| SHRCR | −0.059*** | −8.83 | 0.043* | 1.80 |
| BOARD | −0.001 | −1.14 | 0.004** | 2.32 |
| BI | 0.000 | (0.03) | 0.013 | 0.28 |
| CEOCHR | 0.000 | 0.13 | −0.010* | −1.78 |
| MGT | −0.034*** | −4.88 | −0.052** | −2.07 |
| Intercept | 0.093*** | 0.505*** | 0.696*** | 2.746*** |

Note: *, **, *** denotes statistical significance at the levels of 10%, 5% and 1%, respectively (two-tailed test).

As shown in Column (1) and (2), the coefficients of subsidiary profit distribution level (SDIV) are −0.170 and −0.082, respectively, and both are significant at 1% level. When the dependent variable is the total asset turnover ratio (TO), the coefficients of SDIV in Column (3) and (4) are positive (0.828 and 0.945, respectively) and significant at 1% level. For the economic magnitude of the effect shown in Column (2), when the level of profit distribution increases by one standard deviation (1.9%), the agency cost of business groups reduces by 0.16%, accounting for 1.65% (0.16%/0.097) of the change of the overall management expense ratio of the business group on the average. The results for total assets turnover, shown in Column (4), yield similar conclusions.

Taken together, the empirical results represented in Table 3 support hypothesis 1. With the increase of subsidiary profit distribution, the business group agency costs reduce and the governance efficiency improves.
4.3. **Robust tests**

We run a battery of sensitivity analyses to check the robustness of our key findings. (1) we re-measure the independent variable by using total cash in the consolidated balance sheet to scale the dividends from subsidiaries; (2) we exclude the samples in the year of 2006, insolvent samples, ST/PT samples, delisting samples, and cross listed samples; (3) we adjust the test period and focus on samples between the year of 2014 and 2017 since the execution of new accounting standard for investment. The robust results (untabulated) support the above findings.

4.4. **Dealing with endogeneity**

We utilise several methods to address the concern that “reverse causation” or “omitted variables” problem may confound our findings.

(1) Instrumental Variable Method

We use the level of household savings in the specific province (SR) as the instrumental variable. This variable is measured by the difference between disposable income and consumer expenditure, scaled by disposable income. The results are reported in Table 4. The coefficients of SDIV in columns (2) and (3) are still significant at the level of 10%, which support our main assumption.

(2) Propensity Score Matching (PSM)

We first estimate the probability that subsidiaries issue cash dividends and then form the propensity score matched sample. We control for the variables of subsidiary business proportion (SAR), size (SIZE), leverage levels (LEV), cash flow level of operating activities (OCFA), growth (SGTH), listing years (AGE), the shareholding ratio of the largest shareholder (SHRCR), board size (BOARD), the proportion of independent directors (BI), whether the chairman and CEO are the same person (CEOCHR), the shareholding ratio of managers (MGT) and the year fixed effects to conduct PSM. We use the nearest neighbour matching method, the pairing is performed without replacement at a ratio of 1:1, and the Caliper values are set to 0.01, 0.03, and 0.10, respectively. The results (untabulated) keep unchanged.

5. **Channel analyses**

This paper further examines the channels by which the profit distribution of subsidiaries reduces the overall agency cost of the business group. Specifically, this paper conducts mediation factor tests from the perspectives of relative agency cost between parent and subsidiaries and free cash flow of business group.

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5 The reason why ending cash is used as the denominator is that cash is a scarce and easily used resource (Dittmar & Mahrt-Smith, 2007), which is closely related to the topic of business group governance. On the other hand, the profit repatriation of subsidiaries will directly affect the cash distribution of business groups, and the ending cash as the denominator can reflect the impact of the profit repatriation of subsidiaries on the cash distribution of business groups.

6 All of these results are available upon request.

7 Since the data of residents’ disposable income in 2013 and after are different from those before in terms of survey scope, survey methods and index calibre, in order to ensure comparability, this paper selects the average value of savings ratio in 2011 and 2012 in the middle years of 2006–2017 to replace the savings ratio in other years.

8 All of these results are available upon request.
Relative agency cost between parent and subsidiaries

The distribution of subsidiary’s profits reduces the agency costs of the subsidiary, but at the same time increases the agency costs of the parent company. However, due to stricter supervision of the parent company, the decrease of agency costs of subsidiaries is greater than the increase of agency costs of parent companies. Therefore, the overall agency cost of the business group is still reduced. In order to verify this channel, this paper draws on the mediation factor test of Wen et al. (2004) and uses the agency costs of the parent and subsidiary as the mediation factor.

Specifically, the test model of the mediation effect is as follows:

\[ SAC_{it} = \alpha + \beta_1 SDIV_{it} + \beta_2 SSIZE_{it} + \beta_3 SLEV_{it} + \beta_4 SOCFA_{it} + \beta_5 SSGTH_{it} + \beta_6 AGE_{it} + \beta_7 SHRCR_{it} + \beta_8 BOARD_{it} + \beta_9 BI_{it} + \beta_{10} CEOCHR_{it} + \beta_{11} MGT_{it} + \gamma_i + \mu_t + \varepsilon_{it} \]

\[ PAC_{it} = \alpha + \beta_1 SDIV_{it} + \beta_2 PSIZE_{it} + \beta_3 PLEV_{it} + \beta_4 POCFA_{it} + \beta_5 PSGTH_{it} + \beta_6 AGE_{it} + \beta_7 SHRCR_{it} + \beta_8 BOARD_{it} + \beta_9 BI_{it} + \beta_{10} CEOCHR_{it} + \beta_{11} MGT_{it} + \gamma_i + \mu_t + \varepsilon_{it} \]
In model (2), SAC is the agency cost of the subsidiary, measuring by the management expense ratio (SMFR) and the total asset turnover ratio (STO) of the subsidiary. SMFR is the difference between consolidated management expense and parent company’s management expense, divided by the difference between consolidated sales and the parent company’s sales. The total asset turnover ratio (STO) of the subsidiary is the ratio of the difference between the consolidated sales and the parent’s sales to the total assets of the subsidiary. SSIZE is the size of the subsidiary, measured by the natural logarithm of the total assets of the subsidiary. SLEV is the leverage level of the subsidiary, measured by the ratio of the total liabilities of the subsidiary to the total assets of the subsidiary. SOCFA is the level of cash flow from operating activities of the subsidiary, which is the ratio of the difference between consolidated cash flow from operating activities and that in the parent company to the total assets of the subsidiary. SSGTH is the growth of subsidiaries, measured by the growth rate of sales revenue of subsidiaries. The rest of variables are the same as above.

In model (3), PAC is the agency cost of the parent company. We also use the parent company’s management expense ratio (PMFR, the ratio of parent company’s management expenses to its sales) and the parent company’s total asset turnover ratio (PTO, the ratio of the parent company’s sales to its assets) to measure the costs. In terms of control variables, PSIZE (the natural logarithm of the total assets of the parent) is the size of the parent company; PLEV (the ratio of total liabilities of the parent company to its total assets) is the leverage level of the parent company; POCFA (the ratio of the cash flow of the parent company’s operating activities to the total assets of parent company) refers to the cash flow level of the parent company’s operating activities; PSGTH (the growth rate of sales of the parent company) is the growth of the parent company. The definition of the other control variables is consistent with those in Table 1.

Table 5 shows the mediation factor test results with the path of the subsidiary’s agency costs. In Column (1), the coefficient of SDIV is significantly negative, indicating the negative effect of the subsidiary’s profit distribution on its own agency costs. As for the Column (2), the coefficient of SMFR is positive and significant at 1% level, while the coefficient of SDIV is significantly negative at the level of 10%. That is to say, the profit distribution not only affects the group’s agency cost directly, but also has some mediating effects on business group’s agency costs in terms of the subsidiary’s agency costs. The results in Column (3) and (4) are similar as those in Column (1) and (2).

In order to avoid the influence of outliers, SMFR is replaced by 1 if it is greater than 1. Meanwhile, the same treatment is performed for PMFR in model (3).

The total liabilities of the subsidiary is the difference between the consolidated total liabilities and the parent company’s liabilities.

The subsidiary sales are represented by the difference between consolidated sales and parent sales.
The structure of Table 6 which presents the results for the intermediary variable of PAC is similar to that of Table 5. The coefficient of SDIV in Column (1) is significantly positive at 1% level, representing the profit distribution of subsidiary increases the parent company's agency costs. In Column (2), the coefficient of PMFR is 0.092, significantly positive at 1% level, while the coefficient of SDIV is significantly negative at the level of 1%. The results in Column (3) and (4) are similar as those in Column (1) and (2). The above results show that the distribution of subsidiary profits does increase the agency costs of the business group by increasing the agency cost of the parent company.

In sum, the increase of the parent company's agency cost resulting from the profit distribution of subsidiaries is less than the decrease of subsidiaries' agency cost.
Due to the influence of minority shareholders, taxes, transfer costs and other factors, the actual disposable resources owned by business groups will be reduced during the subsidiary profit distribution. According to the free cash flow hypothesis (Jensen, 1986), the distribution of subsidiary profits reduces the idle funds controlled by the group and then weakens manager’s opportunistic behaviour, leading to the decrease of the overall agency cost of the business group. In order to verify this channel, this paper takes the free

### Table 6. Test results of the intermediary effect of parent company agency cost.

| Variables | PMFR (1) | MFR (2) | PTO (3) | TO (4) |
|-----------|----------|---------|---------|--------|
| SDIV      | 0.494*** (6.13) | −4.14*** | −1.86*** | 1.105*** |
| PMFR      | 0.092*** (38.46) |         |         |        |
| PTO       |          |         |         | 0.620*** (83.02) |
| PSIZE     | 0.006* (1.96) | −0.109*** (−34.43) |        |        |
| PLEV      | −0.107*** (−11.44) | 0.203*** (19.85) |        |        |
| POCFA     | −0.119*** (−7.52) | 0.217*** (12.51) |        |        |
| PSGTH     | −0.034*** (−30.24) | 0.022*** (18.02) |        |        |
| SAR       | −0.012*** (−4.14) |         | 0.219*** (21.93) |        |
| SIZE      | −0.021*** (−21.27) | −0.064*** (−19.09) |        |        |
| LEV       | 0.032*** (8.96) | −0.007 (−0.58) |        |        |
| OCFA      | −0.069*** (−11.56) | 0.201*** (10.17) |        |        |
| SGTH      | −0.022*** (−31.39) | 0.071*** (30.26) |        |        |
| AGE       | −0.027*** (−3.14) | 0.011*** (3.98) | −0.030*** (−3.30) | 0.030*** (3.34) |
| SHRRCR    | −0.045** (−2.29) | −0.040*** (−6.34) | 0.046*** (2.18) | −0.044*** (−1.88) |
| BOARD     | 0.000 (0.27) | 0.000 (0.82) | 0.002 (1.22) | 0.001 (0.50) |
| BI        | 0.059 (1.60) | −0.000 (−0.01) | 0.007 (0.18) | 0.055 (1.38) |
| CEOCHR    | −0.002 (−0.40) | −0.001 (−0.71) | −0.004 (−0.89) | −0.012*** (−2.66) |
| MGT       | −0.029 (−1.52) | −0.041*** (−6.60) | 0.003*** (3.04) | −0.063*** (−3.08) |
| Intercept | 0.562*** (3.98) | 0.406*** (8.81) | 3.057*** (19.84) | 1.239*** (8.05) |

**Note:** *, **, *** denotes statistical significance at the levels of 10%, 5% and 1%, respectively (two-tailed test).
cash flow of the business groups as an intermediary variable and try to test whether the profit distribution of subsidiaries actually reduces the agency cost of business groups by reducing the level of free cash flow of business groups.

This paper draws on the methods adopted by Wang et al. (2014) and Wei and Xia (2020) to measure the overall free cash flow level of business groups. In order to test the mediation effect, this paper constructs the following two models:

\[
FCF_{it} = \alpha + \beta_1 SDIV_{it} + \beta_2 ROA_{it} + \beta_3 SOE_{it} + \beta_4 SIZE_{it} + \beta_5 LEV_{it} + \beta_6 OCFA_{it} \\
+ \beta_7 AGE_{it} + \beta_8 SHRCR_{it} + \beta_9 BOARD_{it} + \beta_{10} BI_{it} + \beta_{11} CEOCHR_{it} + \beta_{12} MGT_{it} \\
+ \gamma_i + \mu_t + \epsilon_{it}
\]

\[
AC_{it} = \alpha + \beta_1 SDIV_{it} + \beta_2 FCF_{it} + \beta_3 SGTH_{it} + \beta_4 SAR_{it} + \beta_5 SIZE_{it} + \beta_6 LEV_{it} \\
+ \beta_7 OCFA_{it} + \beta_8 AGE_{it} + \beta_9 SHRCR_{it} + \beta_{10} BOARD_{it} + \beta_{11} BI_{it} + \beta_{12} CEOCHR_{it} \\
+ \beta_{13} MGT_{it} + \gamma_i + \mu_t + \epsilon_{it}
\]

In model (5), FCF is the level of free cash flow. ROA is the return on assets. SOE refers to the nature of property rights, and is set to 1 for state-owned enterprises and 0 otherwise. Other control variables are described in Table 1. The free cash flow (FCF) variable is added in Model (6) on the basis of Model (1). The results are presented in Table 7.

Column (1) in Table 7 is the regression result of Model (5), and Column (2) and (3) are the regression results of model (6). It can be seen that the coefficient of SDIV in Column (1) is significantly negative at 5% level, the coefficients of FCF in Column (2) and (3) is 0.055 and −0.263, respectively, significantly at 1% level. The results show that the profit distribution of subsidiaries does reduce the agency cost of business groups by reducing the level of free cash flow. In addition, the coefficients of SDIV in Column (2) and (3) are statistically significant.

Therefore, it can be concluded that the reduction of the overall agency cost of the business group by the distribution of subsidiary profits is partly caused by the reduction of the overall free cash flow of the business group.

6. Additional analysis

6.1. The relationship between subsidiary profit distribution and overall agency cost of business group: a perspective of subsidiary heterogeneity

The above research results show that with the increase of the profit distribution of subsidiaries, the agency cost of the business group as a whole is reduced. One of the main reasons is relative change of agency costs between parent company and subsidiaries. Therefore, the heterogeneity of subsidiaries plays an important role in the relationship between the profit distribution of subsidiaries and the overall agency cost of the business group. Under the condition of the high level of subsidiary profit distribution,

\[12\] Specifically, free cash flow is calculated as below. Free cash flow = operating cash flow – maintenance investment – expected investment. Where, operating cash flow = net cash flow from operating activities/total assets at the beginning of the year. Maintenance investment = (depreciation of fixed assets + amortisation of intangible assets + amortisation of long-term deferred expenses)/total assets at the beginning of the year. Expected investment is estimated using Richardson (2006) approach.
which company has a greater effect on reducing the overall agency cost of the business group? We try to investigate the above issue from the following three aspects: business importance, debt financing importance and growth of the subsidiary.

In order to test the above questions, based on model (1), the following model is constructed:

\[
AC_{it} = \alpha + \beta_1 SDIV_{it} + \beta_2 SSR_{it} (SDR_{it}, DSubAGTH_{it}) + \beta_3 SDIV_{it} \times SSR_{it} (SDIV_{it} \times SDR_{it}, SDIV_{it} \times DSubAGTH_{it}) + \beta_4 SAR_{it} + \beta_5 SIZE_{it} + \beta_6 LEV_{it} + \beta_7 OCFA_{it} + \beta_8 SGTH_{it} + \beta_9 AGE_{it} + \beta_10 SHRCR_{it} + \beta_11 BOARD_{it} + \beta_12 BI_{it} + \beta_13 CEOCHR_{it} + \beta_14 MGT_{it} + \gamma_i + \mu_t + \epsilon_{it}
\]

In model (7), SSR refers to the subsidiary’s business importance, and SDR is the debt financing importance of the subsidiary. Referring to Ma et al. (2020), SSR is calculated as the subsidiary’s sales, divided by consolidated sales. SDR is the total liabilities of the subsidiary, scaled by the consolidated liabilities. DSubAGTH is the growth of the subsidiary, measured by the growth rate of total assets of subsidiaries, which is adjusted at the
**Table 8.** The relationship between the profit distribution of subsidiaries and the overall agency cost of business groups: the impact of the heterogeneity of subsidiaries.

| Variables | MFR (1) | TO (2) | MFR (3) | TO (4) | MFR (5) | TO (6) |
|-----------|---------|--------|---------|--------|---------|--------|
| SDIV      | 0.146*  | 0.165  | 0.043   | 0.511**| -0.070**| 1.001***|
|           | (1.74)  | (0.52) | (0.69)  | (2.18) | (-2.46) | (9.36) |
| SSR       | -0.007**| 0.131***|        |        |         |        |
|           | (-1.96) | (10.22)|        |        |         |        |
| SDIV×SSR  | -0.333***| 1.315***|        |        |         |        |
|           | (-2.98) | (3.08) |        |        |         |        |
| SDR       |        |        | -0.005 | 0.003  |        |        |
|           |        |        | (-1.18) | (0.23) |        |        |
| SDIV×SDR  |        | -0.271**| 1.200***|        |         |        |
|           |        |        | (-2.39) | (2.84) |        |        |
| DSubAGTH  | 0.002***|        |        |        | -0.007***|        |
|           | (10.37) |        |        |        | (-11.90)|        |
| SDIV×DSubAGTH | 0.280*** |        |        |        | -0.749**|        |
|           | (3.48)  |        |        |        | (-2.46)|        |
| SAR       | 0.000   | -0.034**| -0.004 | 0.034**| -0.017***| 0.067***|
|           | (0.12)  | (-2.33) | (-0.98) | (2.00) | (-5.08) | (5.28) |
| SIZE      | -0.020***| -0.118***| -0.023***| -0.103***| -0.022***| -0.107***|
|           | (-19.12)| (-28.87)| (-22.09)| (-26.13)| (-21.37)| (-26.80)|
| LEV       | 0.034***| 0.103***| 0.042***| 0.102***| 0.041***| 0.102***|
|           | (8.76)  | (6.93)  | (10.49) | (6.90) | (10.55) | (6.89) |
| OCFA      | -0.074***| 0.345***| -0.086***| 0.339***| -0.084***| 0.339***|
|           | (-11.13)| (13.63) | (-12.69)| (13.10)| (-12.57)| (13.36)|
| SGTH      | -0.020***| 0.078***| -0.020***| 0.080***| -0.023***| 0.094***|
|           | (-26.36)| (27.71) | (-27.85)| (29.58)| (-29.51)| (31.98)|
| AGE       | 0.012***| 0.013   | 0.016***| 0.013  | 0.015***| 0.015  |
|           | (3.99)  | (1.16)  | (5.40)  | (1.19) | (5.16)  | (1.34) |
| SHRCR     | -0.046***| 0.033   | -0.052***| 0.024  | -0.058***| 0.039  |
|           | (-6.82) | (1.27)  | (-7.57) | (0.92) | (-8.46) | (1.51) |
| BOARD     | -0.001  | 0.007***| -0.001  | 0.006***| -0.001  | 0.007***|
|           | (-1.05) | (3.66)  | (-1.09) | (3.23) | (-1.38) | (3.43) |
| BI        | -0.001  | 0.055  | -0.002  | 0.040  | -0.004  | 0.046  |
|           | (-0.06) | (1.08)  | (-0.12) | (0.77) | (-0.26) | (0.88) |
| CEOCHR    | -0.000  | -0.012**| 0.001  | -0.011*| 0.000  | -0.009  |
|           | (-0.13) | (-2.09) | (0.58)  | (-1.89) | (0.31)  | (-1.55) |
| MGT       | -0.038***| -0.036  | -0.038***| -0.057**| -0.038***| -0.044**|
|           | (-5.17) | (-1.27) | (-4.90) | (-2.00) | (-4.92) | (-1.51) |
| Intercept | 0.405***| 2.825***| 0.401***| 2.542***| 0.404***| 2.577***|
|           | (8.00)  | (14.60) | (7.70)  | (13.13) | (7.89)  | (13.31) |

Table fixed effects: Yes, Yes, Yes, Yes, Yes, Yes

Year fixed effects: Yes, Yes, Yes, Yes, Yes, Yes

N: 18667, 18667, 19294, 19294, 18886, 18886

R²: 0.117, 0.161, 0.133, 0.148, 0.138, 0.159

Note: *, **, *** denotes statistical significance at the levels of 10%, 5% and 1%, respectively (two-tailed test).

Business group level. Accordingly, SDIV×SSR, SDIV×SDR and SDIV×DSubAGTH are the interaction term between the subsidiary profit distribution (SDIV) and SSR, SDR and DSubAGTH respectively.

Table 8 reports the results of the influence of subsidiary heterogeneity on the relationship between subsidiary profit distribution and the overall agency cost of the business group. Among them, the dependent variables in Columns (1), (3) and (5) are the management expense ratio (MFR) of the business group, and the dependent variables in Columns (2), (4) and (6) are the overall total asset turnover ratio (TO) of the business group.
It can be seen that in Column (1) and (2), the coefficients of the interaction term of $SDIV \times SSR$ are $-0.333$ and $1.315$, respectively, and both are statistically significant at the 1% level, indicating that if the subsidiaries are important to the business group, the reduce effect of profit distribution of subsidiaries on the business groups’ agency cost is greater. The possible reason is that when the proportion of business undertaken by subsidiaries is higher, the role of subsidiaries within the group is more prominent (Ma et al., 2020). The decrease of agency cost of subsidiaries can better alleviate the agency problem of the business group as a whole.

The use of funds in subsidiaries is relatively flexible, with high autonomy and arbitrariness when they are more independent on its own debt financing than on the parents company’s help. These opportunistic chance results in more severe agency problems. The business group will benefit more when the profits are transferred from companies with weak governance. In Column (3) and (4), the coefficients of $SDIV \times SDR$ are statistically significant, indicating that the higher the proportion of debt financing undertaken by subsidiaries, the more significant the reduction effect of the profit distribution of subsidiaries on the overall agency cost of business groups is.

In Column (5) and (6), the coefficients of $SDIV \times DSubAGTH$ are significantly positive and negative at the levels of 1% and 5%, respectively, indicating that the lower the growth of the subsidiary, the more significant the effect of profit distribution on the reduction of the overall agency cost of the business group is. When the growth of the subsidiary is lower, it faces fewer external investment opportunities. At this time, the motivation of the managers to take opportunistic behaviour is stronger (Li & Li, 2011), and the benefit of distributing the profits to the parent company is greater.

### 6.2. The influence of subsidiary profit distribution on the value of business group

Jensen and Meckling (1976) believe that the core of agency problem is the conflicts between shareholders and managers, which is harmful to the value of the company. Dittmar and Mahrt-Smith (2007) find that corporate governance affects the value of cash holding, which indirectly verified that the reduce of agency costs would lead to the improvement of corporate value. Based on China’s capital markets, scholars find similar conclusions (Du et al., 2011).

The findings above show that profit distribution by subsidiaries can effectively alleviate the agency costs of business groups. We try to examine whether the profit distribution by subsidiaries will improve the value of business groups or not and then construct Model (8):

$$
TBQ_{it} = \alpha + \beta_1 SDIV_{it} + \beta_2 SAR_{it} + \beta_3 SIZE_{it} + \beta_4 LEV_{it} + \beta_5 OCFA_{it} + \beta_6 SGTH_{it} + \beta_7 AGE_{it} + \beta_8 SHRCR_{it} + \beta_9 BOARD_{it} + \beta_{10} Bl_{it} + \beta_{11} CEOCHR_{it} + \beta_{12} MGT_{it} + \gamma_i + \mu_t + \epsilon_{it}
$$

The dependent variable in Model (8) is the Tobin Q ($TBQ$) of the business group. The definition of the remaining variables is shown in Table 1.

Column (1) and (2) of Table 9 report the results of the effect of the subsidiary profit distribution on the value of the business group. The coefficients of $SDIV$ in Column (1) and (2) are 3.459 and 3.757, respectively, both significant at 1% level. The results indicate that
the more subsidiary profits are distributed, the greater the value of the business group is. The distribution of the subsidiary profits is beneficial to the improvement of the business group value and verifies the Hypothesis 1 indirectly.

Furthermore, we try to investigate whether the agency costs affect the relationship between profit distribution and group value. The interaction term SDIV×GAC and the variable GAC are added in Model (8). The GAC is measured by the overall cash holding level (CASH) of the business group and the overall free cash flow level (FCF) of the business group. If the coefficient of SDIV×AC is positive, the value-added effect of subsidiary profit distribution is greater when the agency costs is higher. The results are indicated in Columns (3) and (4) of Table 9. The coefficient of SDIV×CASH in Column (3) and that of SDIV×FCF in Column (4) are significantly positive. Based on the above results, it can be seen

| Variables | (1) | (2) | (3) | (4) |
|-----------|-----|-----|-----|-----|
| SDIV      | 3.459*** | 3.757*** | −0.213 | 3.880*** |
| CASH      |       | 0.521*** | −0.20 | (4.94) |
| SDIV×CASH |      | 20.253*** | −0.250 | (1.40) |
| FCF       |      |       | −0.250 | (1.40) |
| SDIV×FCF  |      |       | 12.056* | (1.91) |
| SAR       | 0.715*** | 0.774*** | 0.682*** | (11.29) |
| SIZE      | −1.275*** | −1.283*** | −1.220*** | (−61.13) |
| LEV       | −1.022*** | −0.892*** | −1.053*** | (−13.23) |
| OCFA      | 1.003*** | 0.858*** | 1.242*** | (7.63) |
| SGTH      | 0.185*** | 0.181*** | 0.194*** | (12.57) |
| AGE       | −0.202*** | −0.188*** | −0.191*** | (−3.33) |
| SHRCR     | 0.252* | 0.245* | 0.408*** | (1.87) |
| BOARD     | 0.029*** | 0.028*** | 0.031*** | (2.83) |
| BI        | 0.540* | 0.525* | 0.595** | (2.01) |
| CEOCHR    | 0.022 | 0.016 | 0.002 | (0.72) |
| MGT       | −0.290* | −0.380*** | −0.290* | (−2.05) |
| Intercept | 3.337*** | 33.099*** | 32.956*** | 31.823*** |

Note: *, **, *** denotes statistical significance at the levels of 10%, 5% and 1%, respectively (two-tailed test).
that when the agency cost is higher, subsidiary profit distribution can significantly improve the overall value of the business group, indicating the economic consequences of subsidiary profit distribution, which is also consistent with the theoretical expectation of Hypothesis 1.

7. Conclusion

There is a growing body of literature that studies the effect of cash distribution on agency costs of business groups (Zhang and Lu, 2012; Cheng et al., 2020; Harford et al., 2017). However, few studies focus on the formation process of the cash distribution of business groups. Based on the “dual disclosure system” in China’s capital market, we investigate the influence of internal fund transfer on the governance efficiency of business groups from the perspective of subsidiary profit distribution. The results show that the more the subsidiary profits are distributed, the less the agency costs of the business group are. We confirm our results using a battery of sensitivity and additional analyses. In the channel analysis, we find that the agency costs reduced effect in the business group is the result of the relative change of the agency costs between the parent company and the subsidiaries and the reduce of free cash flow. Furthermore, the benefits of subsidiary profit distribution on agency costs are greater in groups with higher subsidiary business importance and debt financing importance, and in groups with lower growth of the subsidiary. Finally, we find the subsidiary profit distribution can increase the value of the business group. This value-added effect is greater when the overall agency cost of the business group is higher. This paper provides important policy implications on how to utilise the subsidiary profits and how to improve the group’s governance efficiency.

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