



# Cash flow statements and firm value: Evidence from Taiwan

Yensen Ni<sup>a</sup>, Paoyu Huang<sup>b,\*</sup>, Pinhui Chiang<sup>a</sup>, Yulu Liao<sup>c</sup>

<sup>a</sup> Department of Management Sciences, Tamkang University, New Taipei, Taiwan

<sup>b</sup> Department of International Business, Soochow University, Taipei, Taiwan

<sup>c</sup> Department of Accounting Information, Takming University of Science and Technology, Taipei, Taiwan

## ARTICLE INFO

### Article history:

Received 18 September 2017

Received in revised form 28 August 2018

Accepted 23 September 2018

Available online 5 October 2018

### JEL classification:

G30

G31

G32

### Keywords:

Cash flow statement

Firm value

Cash flow

Corporate governance

## ABSTRACT

By studying cash flows from operating, investing, and financing activities, we explore the effect of these various cash flows on firm value by employing censored panel data models due to concerning panel data employed and characteristics of dependent variables. Results imply that firms raising funds for capital budgeting projects can enhance their firm value, resulting in cash inflows from financing activities and cash outflows to investing activities consistent with our cognitions. However, results reveal that cash inflows from operating activities may not be regarded as a positive signal different from the relevant studies. We infer that the market is increasingly competitive for Taiwanese enterprises due to more and more competitors from South Korea and China; in addition, we argue that firm value might not be enhanced if cash inflows from operating resulting from sales increased due to lower profit margin or purchases shrunk owing to market share declined.

© 2018 Board of Trustees of the University of Illinois. Published by Elsevier Inc. All rights reserved.

## 1. Introduction

Cash flow statements may provide information relevant to the assessment of future cash flows and their uncertainty and to the market value of firms (Akbar, Shah, & Stark, 2011). Krishnan and Largay (2000) indicated that forecasting future cash flows is fundamental to the valuation and investment analysis of a firm. Thus, we endeavor to explore the essential information contained in cash flow statements, such as cash flows in operating, investing, and financing activities, and further examine the effects of cash flows from these activities on firm value. In addition, Dickinson (2011) argued that investors do not fully incorporate information contained in cash flow patterns, causing mature firms to be undervalued. Dickinson also emphasized that appropriate cash flow proxies are useful tools that have applications in analysis, forecasting, and valuation for future research.

In fact, accrued revenue, such as unpaid proceeds from the delivery of goods or services, is an asset when income is earned and a related revenue item is recognized, while cash will be received in a later period when the amount is deducted from accrued rev-

enues. However, if the cash will not be received, bad debts would be incurred. Under such circumstances, information obtained from cash flow statements should be more reliable than that in income statements. Furthermore, regarding the consumption of capital goods, net income measures use depreciation, while free cash flow measures use the net capital purchases of the previous period (Howe, He, & Kao, 1992; Kaplan & Zingales, 1997).

Despite the longstanding requirement for cash flow statements, debates continue on the usefulness of the information contained in these statements (Barton, Hansen, & Pownall, 2010; Kumar & Krishnan, 2008; Laswad & Baskerville, 2007; Subramanyam & Venkatachalam, 2007). Barton et al. (2010) described the properties of accounting numbers as may vary across markets. Thus, in this study, we explore whether information derived from cash flow statements would affect firm value. In addition, cash flows are divided into the following general classifications: cash flows from operating activities, cash flows investing activities, and cash flows from financing activities.

Therefore, this study aims to examine whether cash flows from operating, investing, and financing activities would affect firm value instead of annual abnormal returns (Livnat & Zarowin, 1990) after controlling the relevant variables related to corporate governance, financial statements, and others, given that the purpose of financial statements is to provide information in valuing a firm (Laitinen, 2006).

\* Corresponding author at: Department of International Business, Soochow University, No. 56, Sec. 1, Kueiyang St., 100 Taipei, Taiwan.  
E-mail address: [hpy@scu.edu.tw](mailto:hpy@scu.edu.tw) (P. Huang).

In this study, results show that cash flows from investing activities are negatively related to firm value, whereas cash flows from financing are positively related to firm value. We argue that firms may raise funds for capital budgeting projects for the purpose sustainable development resulting in cash inflows from financing activities and cash outflows from investing activities, indicating that enterprises seek to maximize the market value of the firm in making their corporate capital expenditure decisions (McConnell & Muscarella, 1985). However, results reveal that cash inflows from operating activities may not be regarded as a positive signal different from the relevant study proposed by Livnat and Zarowin (1990). We infer that the market is increasingly competitive for Taiwanese enterprises due to more and more competitors from China and South Korea. Thus, firm value might not be enhanced if cash inflows from operating resulting from sales increased due to lower profit margin or purchases shrunk owing to market share declined, indicating that the firms with positive cash flow from operating might not enhance firm value due to more and more competitive markets faced by Taiwanese enterprises. Furthermore, Taiwan was ranked from the top of Four Asian Dragons (Taiwan, South Korea, Hong Kong, and Singapore) before to the bottom of Four Asia Dragan in the this decade, indicating that the competition of Taiwan is not as strong as before, since market share for many industries in Taiwan shrunk even taken over by South Korea and China. In addition, the revealed results are verified by using cash flow ratio variables, cash flow ratio variables with concerning outliers, and cash flow dummy variables<sup>1</sup> for robustness in this study.

This study contributes to existing literature in the following aspects. First, we argue that cash flow management would be an essential issue for enterprises. However, the diverse effects of cash flow from operating, investing, and financing activities to firm value seem rarely explored in the existing literature comprehensively. Second, we reveal that cash inflows from operating activities may not be regarded as a positive signal different from our cognitions. We infer that the market is increasingly competitive due to more and more competitors from South Korea and China. Thus, firm value is unlikely enhanced if cash inflow from operating resulting from sales increased due to lower profit margin or purchases shrunk owing to market share declined. Third, we argue that exploring the effects of cash flow statements to firm value would not only be beneficial for capital budgeting in terms of corporate finance but also provide valuable information for enterprises in decision making.

The rest of the paper is organized into the following sections. Section 2 surveys the relevant literature and hypotheses proposed. Section 3 introduces the data, variables, and methodology employed in this study. Section 4 presents the empirical results and analyses. Section 5 concludes the paper.

## 2. Literature reviews and hypotheses proposed

To familiarize ourselves with related studies, we conducted a survey of the previous literature. Regarding the relevant literature related to cash flows, some relevant studies investigating the relevance of accounting data in forecasting future cash flows have focused on the relative predictive ability of aggregate cash flow from operations and earnings (Badertscher, Collins, & Lys, 2012; Bowen, Burgstahler, & Daley, 1986; Dechow, Kothari, & Watts, 1988; Subramanyam & Venkatachalam, 2007). Furthermore, Barth, Cram, and Nelson (2001) documented the superiority of operating

cash flows over earnings in predicting future operating cash flows. These relevant studies indicate that cash flows have predicting powers on earnings and future cash flows. Furthermore, although the results of earlier research using estimated cash flow are mixed (Bowen et al., 1986; Greenberg, Johnson, & Ramesh, 1986), more recent studies use cash flow information, as reported in cash flow statements, and demonstrated cash flow as a better predictor of future cash flows than earnings (Barth et al., 2001; Subramanyam & Venkatachalam, 2007).

As for cash flows and firm valuation, Barth et al. (2001) explained that the primary objective of financial reporting is to provide information that will help users evaluate prospects for future cash flows of a company, especially that future cash flows are fundamental for the valuation of enterprises. In addition, Kumar and Krishnan (2008) explored whether cash flows and accruals would vary in relation to the investment opportunity and revealed that the value relevance of cash flows and accruals could vary across firms and according to circumstances. However, Livnat and Zarowin (1990) examines whether components of operating, financing, and investing cash flows are differentially associated with annual abnormal returns, as predicted by theoretical models in finance and economics, and reveal that disaggregation of financing and operating cash flows into their components significantly improves annual security returns. Krishnan and Largay (2000) also indicated that forecasting future cash flows is fundamental to the valuation and investment analysis of a firm. Recently, Artakis and Papanastopoulos (2016) find that the cash component of earnings is more persistent than the accrual component and that this higher persistence can be attributed primarily to cash distributed to equity holders.

In addition, relevant studies indicate that cash flow information can be useful in predicting financial distress resulting in firm value affected (Aziz, Emanuel, & Lawson, 1988; Aziz & Lawson, 1989; Beaver, 1966; Blum, 1974; Casey & Bartczak, 1984, 1985; Deakin, 1972; Gentry, Newbold, & Whitford, 1985; Gentry, Newbold, & Whitford, 1987; Gilbert, Menon, & Schwartz, 1990). Furthermore, Barth et al. (2001) documented the superiority of operating cash flows over earnings in predicting future operating cash flows. These relevant studies indicate that cash flows have predicting powers on earnings, financial distress, and future cash flows.

In fact, cash inflows instead of cash outflows from operating activities would enhance stock price performance (Livnat & Zarowin, 1990), and even firm value, because a higher net income increases cash inflows, particularly during operating activities. Similarly, higher cash inflows from operating over sales (Operating/Sales) enhance firm values because of Operations/Sales increases as a result of an increased net income. Thus, we argue that cash inflows from operating activities would enhance firm value, and we thus propose our first hypothesis.

**Hypothesis 1.** The higher cash inflow from operating over sales (Operating/Sales) would enhance firm value.

In addition, for a firm without investing opportunities, we infer that cash outflows instead of cash inflows from investing activities reflect in cash flow statements. In addition, we further document that higher the ratio, cash outflows from investing activities over total assets excluding current assets (Investing/(TA-CA)), relay a positive signal because of the above inference. We then argue that cash outflows from investing activities would enhance firm value as well, and we then propose our second hypothesis.

**Hypothesis 2.** The higher cash outflow from investing activities over total assets excluding current assets (Investing/(TA-CA)) would enhance firm value.

As for cash inflows from financing activities, we argue that cash inflows might convey a positive signal because of the requirement

<sup>1</sup> Operating dummy is set as 1 if cash flows from operating activities are positive; otherwise, 0. We then employ either cash flow from operating or operating dummy to explore whether cash flow from operating would affect firm value. In addition, we winsorize the dependent and independent variables at 1% and 99% tail in order to minimize the impact of outlier observations.

of financing capital budgeting projects. However, cash inflows from financing over the sum of long-term debt and equities (Financing/(LD+TE)) may not indicate a positive signal if the cash inflows are caused by financial distress because of inferior corporate governance or of higher debt ratio emerging from the inferior financial performance. We then document that cash inflow from financing activities over the sum of long-term debt and equities (Financing/(LD+TE)) would enhance firm value as well, and we then propose our third hypothesis.

**Hypothesis 3.** The higher cash inflows from financing activities over the sum of long-term debt and equities (Financing/(LD+TE)) would enhance firm value.

By studying cash flows from operating, investing, and financing activities, we explore whether these cash flows variables including Operating/Sales, Investing/(TA-CA), and Financing/(LD+TE) would affect firm value. However, whether cash flows from these activities would be beneficial for firm value enhancement seems rarely explored in the relevant literature. In addition, although components of cash flow statement might be interrelated, the components of balance sheets such as cash, account receivables, and inventory are explored in the relevant literature (Acharya, Davydenko, & Strebulaev, 2012; Banker, Byzalov, Ciftci, & Mashruwala, 2014; Belo & Lin, 2012; Lemmon, Liu, Mao, & Nini, 2014).

Furthermore, instead of employing Operating /Sales, Investing / (TA-CA), Financing/(LD+TE) as the variables in terms of cash flow from operating, cash flow from investing, and cash flow from financing. We also employ operating dummy, investing dummy, and financing dummy<sup>2</sup> for robustness concerns. Due to positive operating dummy, negative investing dummy, and positive financing dummy might enhance firm value as the reference mentioned above. We then propose the following hypotheses.

**Hypothesis 4.** The positive operating dummy would enhance firm value.

**Hypothesis 5.** The negative investing dummy would enhance firm value.

**Hypothesis 6.** The positive financing dummy would enhance firm value.

Aside from the relationship between cash flows and firm valuation, we argue that variables related to corporate governance and financial performance would affect firm performance and firm value, which has been widely explored in relevant studies (Ammann, Oesch, & Schmid, 2011; Black & Kim, 2012; Black, Kim, Jang, & Park, 2015; Brown & Caylor, 2006; Chhaochharia & Grinstein, 2007; Gonzalez & André, 2014; Haque, 2017; Hardwick, Adams, & Zou, 2011; Lemmon & Lins, 2003; Ni & Huang, 2015; Nini, Smith, & Sufi, 2012; Wahab & Holland, 2012).

Bauer, Braun, and Clark (2008) investigated whether enterprises with more corporate governance mechanism would perform better than firms with fewer corporate governance mechanisms, and the results revealed that the financial performances of the former are much better than those of the latter. Judge, Naoumova, and Koutzevol (2003) indicated that effective corporate governance would be essential for firm performance. Depending on the corporate governance variables employed, Bauguess, Moeller, Schlingemann, and Zutter (2009) showed that firm performance would be enhanced for the firms with high directors' shareholding ratio, as in charge of business affairs. In addition, Jensen and

Meckling (1976) exhibited that managers with high shareholding ratio are motivated to improve firm performance because any business loss affects their own interests. However, Fahlenbrach and Stulz (2009) revealed that managers increase their shareholding as the firm faces a financial dilemma, but reduce their shareholding as the firm performs better.

Aside from the shareholding of directors and managers, Lee and Yeh (2004) argued that a higher compensation is frequently allocated to directors who obtain loans by pledging most of their shares. Cochran, Wood, and Jones (1985) and Mehran (1995) demonstrated that independent directors with professional experiences enhance the function of the board. Chi, Hung, Cheng, and Lieu (2015) showed that CEO duality increases earnings management in family-owned firms, while Chiang and Lin (2007) showed that CEO duality can help improve manufacturing firm productivity in Taiwan. Furthermore, Yermack (1996) indicated that communication efficiency declines as board size increases, which then weakens firm performance. O'Connell and Cramer (2010) revealed that board size is negatively related to firm performance.

Regarding variables related to financial statements, Barton and Simko (2002) indicated that share prices would increase for the firms exhibiting better asset management. Borokhovich, Brunarski, Crutchley, and Simkins (2004) revealed that financial risk declines in firms with a relatively high current ratio. Cai and Zhang (2011) contended that having a high leverage has a significant negative effect on stock prices. In addition, an ill-functioning board structure is not likely to display superior firm performance (Ahmed, Hossain, & Adams, 2006; Jackling & Juhl, 2009). Moreover, large-scale companies are inclined to take risks to reduce stock price volatilities (Berkman & Bradbury, 1996; Block & Gallagher, 1986; Jin & Jorion, 2006); thus, large-scale firms may have lower stock price volatilities than small-scale firms. Other financial statement variables, such as current ratio, asset turnover ratio, debt ratio, and market value are considered as controlling variables because of their effect on firm performance and firm values.

### 3. Data, variables, and methodology

#### 3.1. Data and variables

We identify firms listed on the Taiwan Stock Exchange (TWSE) as our samples. A total of 7598 firm-year observations from 2005 to 2014 are collected from Taiwan Economic Journal (TEJ). Tobin's q as the firm value proxy is the dependent variable employed in this study, whereas the independent variables are classified into the variables in terms of cash flows, board structure, financial statement, and others, as illustrated in Table 1.

In this study, we explore whether cash flows from operating, investing, and financing activities would affect Tobin's q because of the valuable information contained in financial reports, which is used to evaluate enterprises (Barth et al., 2001; Krishnan & Largay, 2000).

By surveying relevant literature, we attain better control of the board structure, financial statement, and other controlling variables, and then explore whether cash flows from these activities would affect firm value. Thus, we incorporate directors' holding ratio, managers' holding ratio, directors' pledge ratio, independent director dummy, CEO duality dummy, and board size as corporate governance variables, as used in relevant literature. In addition, Louis and White (2007) stated that new financial reports frequently affect share prices. We then argue that Tobin's q may be affected by information contained in financial statements and by the inclusion of current ratio, asset turnover ratio, and debt ratio as controlling variables. Furthermore, an ill-functioning board structure unlikely contributes to superior firm performance (Ahmed et al., 2006;

<sup>2</sup> Operating dummy is set as 1 if cash flows from operating activities are positive; otherwise, 0. Investing dummy is set as 1 if cash flows from investing activities are positive; otherwise, 0. Financing dummy is set as 1 if cash flows from financing activities are positive; otherwise, 0.

**Table 1**  
Definition of variables.

Variables	Definitions
Tobin's q	The ratio of the market value of assets to the book value of assets.
Operating /Sales	Cash flows from operating activities over total sales
Investing /(TA-CA)	Cash flows from investing activities over total assets (TA) excluding current assets (CA)
Financing/(LD+TE)	Cash flows from financing activities over long-term debts (LD) plus total equities (TE)
Operating dummy <sup>a</sup>	Set to 1 if cash flows from operating activities are positive; otherwise, 0.
Investing dummy	Set to 1 if cash flows from investing activities are positive; otherwise, 0.
Financing dummy	Set to 1 if cash flows from financing activities are positive; otherwise, 0.
Directors' holding ratio	Total directors' shareholdings over total outstanding shares
Managers' holding ratio	Total managers' shareholdings over total outstanding shares
Directors' pledge ratio	Total directors' pledged shares over their shareholding
Independent director dummy	Set to 1 if a firm recruits independent directors; otherwise, set to 0
CEO duality dummy	Set to 1 if the chairman of a firm is the CEO; otherwise, set to 0
Board size	Total number of directors in the board
Current ratio	Total current assets over total current liabilities
Asset turnover ratio	Total sales over total assets
Debt ratio	Total debts over total assets
Electronic industry dummy	Set to 1 if a firm falling into electronic industry, otherwise, set to 0
Firm scale	ln (market value)

<sup>a</sup> Operating dummy sets to 1 (0) if cash inflows (outflows) from operating activities, investing dummy sets to 1 (0) if cash outflows (inflows) from investing activities, and financing dummy set to 1 (0) if cash inflows (outflows) from financing activities.

Jackling & Johl, 2009; Kiel & Nicholson, 2003; Lee & Yeh, 2004). Firm value is instead likely affected by the function of the board structure as well as the performance of financial statements.

In addition to variables related to corporate governance and financial statements, economic conditions during the study period have been considered. Given that our data span over several years, we incorporate separate year dummies to control intertemporal variations in the market or economic conditions that may affect firm value (Fauver, Houston, & Naranjo, 2003). Given that in measuring Taiwan weighted stock index, the electronic industry has more than 40% weight, we assume that the electronic industry dummy has a varying effect on firm value compared with other industries.

Moreover, large-scale companies are inclined to take risks to reduce stock price volatilities (Berkman & Bradbury, 1996; Block & Gallagher, 1986; Jin & Jorion, 2006; Mian, 1996; Nance, Smith, & Smithson, 1993), which may result in the enhanced firm value of large companies. Thus, we also include firm scale as a controlling variable.

### 3.2. Model

The model is designed to determine whether Tobin's q would be affected by cash flows from operating, investing, and financing activities after incorporating board structure, financial statements, and other controlling variables.

$$\begin{aligned} \text{Tobin's } q_{i,t} = & \alpha + \sum \beta_j (\text{cash flow variables}_j)_{i,t} \\ & + \sum \gamma_j (\text{board structure variables}_j)_{i,t} \\ & + \sum \beta_j (\text{cash flow variables}_j)_{i,t} \\ & + \sum \eta_j (\text{other controlling variables}_j)_{i,t} + e_{i,t} \end{aligned}$$

Cash flow variables, including Operating/Sales, Investing/(TA-CA), and Financing/(LD+TE) are considered in the investigation. As controlling variables, we incorporate directors' holding ratio, managers' holding ratio, directors' pledge ratio, independent director dummy, board size, and CEO duality dummy as board structure variables. In addition, we include current ratio, asset turnover ratio, debt ratio, high-technology dummy, separate

year dummies, and firm scale as financial and other controlling variables.

We then implement variance inflation factor (VIF) test to determine whether multicollinearity problems exist among independent variables. The resulting VIF values for these variables are all less than 3, indicating that multicollinearity issues are not significant. Additionally, we also reveal that the correlations among cash flows from three different activities are not high as well.

In this study, utilizing panel data models instead of traditional linear models is more appropriate because of firm-year observations employed. Furthermore, employing censored panel data models is more suitable than traditional panel data models because of the characteristics of dependent variables.

## 4. Empirical results and analyses

### 4.1. Descriptive statistics

Table 2 presents the descriptive statistics of 7598 firm-year observations from 2005 to 2014 for firms listed in TWSE. For the cash flow variables, Table 2 shows that the mean and median of Operating/Sales are -0.028 and 0.082, respectively. Statistics may be affected by outliers because the minimum value is -858.91. In addition, the mean and median of Investing/(TA-CA) are 0.315 and -0.093, respectively, with the maximum value of 3277.52, indicating that the statistics are affected by outliers.

We then use cash flow dummy variables instead of cash flow ratio variables because cash inflows from operating activities and cash outflows from investing activities are shown in over 80% of the samples, as shown by the mean operating dummy and investing dummy values of 0.81 and 0.18, respectively. More than 80% of the sample firms listed in TWSE are inclined to search for capital budgeting projects resulting in cash outflows from investing activities. The mean financing dummy is 0.385, indicating that less than 40% of the sample firms listed in TWSE exhibited cash inflows from financing activities.

Similar to cases that occurred in the U.S. after the Tech Bubble, several firms listed in TWSE have also suffered. Thus, some of these firms recruit independent directors on the board. Table 2 shows that less than 45% of the sample firms have recruited independent directors, indicating that authorities might not consider the necessity of recruiting independent directors to attend to the needs of the firms. Approximately 48% of the sample firms are electronic firms,

**Table 2**  
Descriptive Statistics.

Variables	Obs.	Mean	Median	Std. Dev.	Min.	Max.
Firm value	7598	1.344	1.119	0.793	0.33	10.01
Operating/sales	7598	-0.028	0.082	10.301	-858.91	153.64
Investing/(TA-CA)	7598	0.315	-0.093	37.670	-185.83	3277.52
Financing/(LD+TE)	7598	-0.012	-0.027	0.206	-3.98	2.96
Operating dummy	7598	0.81	1	0.392	0	1
Investing dummy	7598	0.18	0	0.391	0	1
Financing dummy	7598	0.39	0	0.487	0	1
Current assets	7598	281.34	177.56	728.5	10.60	30495.39
Asset turnover ratio	7598	0.939	0.81	0.657	0	7.22
Debt ratio	7598	43.44	43.68	18.505	1.27	99.13
Directors' holding ratio	7598	22.61	18.93	14.577	0.0012	98.07
Managers' holding ratio	7598	1.09	0.3	2.275	0	44.49
Directors' pledge ratio	7598	9.94	0	18.322	0	100
Independent director dummy	7598	0.44	0	0.497	0	1
Board size	7598	7.21	7	2.388	2	21
CEO duality dummy	7598	0.28	0	0.449	0	1
Electronic industry dummy	7598	0.48	0	0.499	0	1
Firm scale	7598	15.54	15.42	1.446	10.6115	22.02

Note: This table reports the means, standard deviations, maximums, and minimums for the variables employed in this study. The dependent variable employed is Tobin's  $q$  defined as the ratio of the market value of assets to the book value of assets. As cash flow variables, Operating/Sales is defined as cash flow from operating activities over total sales, Investing/(TA-CA) is defined as cash flow from investing activities over total assets (TA) excluding current assets (CA), and Financing/(LD+TE) is defined as cash flow from financing activities over the sum of long-term debts (LD) and total equities (TE). In addition, operating dummy is set to 1 if cash flows from operating activities are positive (cash inflows); otherwise, 0. Investing dummy is set to 1 if cash inflows from investing activities are positive (cash outflows); otherwise, 0. Financing dummy is set to 1 if cash inflows from financing activities are positive (capital inflows); otherwise, 0. Board structure variables include directors' holding ratio that is defined as total directors' shareholdings over total outstanding shares, managers' holding ratio that is defined as total managers' shareholdings over total outstanding shares, and directors' pledge ratio that is defined as total directors' pledge shares over total directors' shareholding. Independent director dummy is set to 1 if a firm recruits independent directors; otherwise, 0. CEO duality dummy is set to 1 if the chairman of a firm is in charge as the CEO; otherwise, 0. Board size is set as total number of directors on the board. Financial statement variables include current ratio that is defined as total current assets over total current liabilities, asset turnover ratio that is defined as total sales over total assets, and debt ratio that is defined as total debts over total assets. Electronic industry dummy is set to 1 if a firm is a high-technology firm; otherwise, 0. Lastly, firm scale is measured as the logarithm of the market value in this study.

indicating that the high-technology industry plays an important role in TWSE.

For corporate governance variables, the mean and standard deviation of directors' holding ratio are 22.61% and 14.58%, respectively, indicating that directors hold a certain percentage of shares that are outstanding on the average, but their holding ratio is relatively discrete for firms listed in TWSE. Furthermore, the minimum directors' holding ratio is only 0.12%, the maximum directors' pledge ratio is as high as 100%, and the maximum debt ratio is 99.13%. These findings reflect that some listed firms may have serious corporate governance issues.

#### 4.2. The effect of cash flow ratio variables to firm values

In exploring the effect of cash flow variables including Operating/Sales, Investing/(TA-CA), and Financing/(LD+TE) on firm value, Table 3 reveals that Investing/(TA-CA) is negatively related to firm value, indicating that firms with cash outflows from investing activities might not enhance firm value. We argue that enterprises looking for profitable capital budgeting projects would not only be helpful for the sustainable development of enterprises but also be beneficial for firm value enhanced. In addition, we reveal that Financing/(LD+TE) positively affects firm value in Table 3, indicating that firms with cash inflows from financing activities would enhance firm value consistent with that market value of the firm increases with corporate capital expenditure decisions (McConnell & Muscarella, 1985). We deduce that the above findings might result from that the firms raising funds for capital budgeting projects to obtain cash inflows from financing activities and cash outflows from investing activities.

However, Operating/Sales is negatively related to firm value, as shown in Table 3, which is different from our cognitions shown in the relevant literature (Livnat & Zarowin, 1990). We infer that the market is increasingly competitive for Taiwanese enterprises due to more and more competitors from South Korea and China. We infer that firm value might not be enhanced if cash inflows from

operating resulting from sales increased due to lower profit margin or purchases shrunk owing to market share declined. For example, cash flows from account receivables collected due to higher sale discount provided as well as cash flows from inventory due to lowering down selling price might not be regarded as favorable to having positive cash inflows from operations.

As our cognitions, higher cash inflows from operating activities might enhance firm value. However, our results are different from Livnat and Zarowin (1990) due to higher annual abnormal returns revealed for the firms with positive cash inflows from operating (Aktas, Croci, & Petmezas, 2015). We infer that the results may be caused by more and more competitions from Korea, China, and Japan, resulting in lowering down the sales prices and providing favorable sales discounts for international customers. As a result, positive cash flows for Taiwanese enterprises might not be regarded as a positive signal.

For variables related to corporate governance and financial statements, we reveal that firms with lower debt ratio, higher asset turnover ratio, higher directors' holding ratio, higher managers' holding ratio, lower directors' pledge ratio, smaller CEO duality, and smaller board size than other firms would have higher firm value, which are consistent with results revealed in previous literature (Barton & Simko, 2002; Eisenberg, Sundgren, & Wells, 1998; Ni & Huang, 2015; O'Connell & Cramer, 2010; Villalonga & Amit, 2006; Yermack, 1996). In addition, Chiang and Lin (2007) showed that a smaller board size may be less encumbered by bureaucratic problems, and CEO duality can help improve productivity in Taiwan's manufacturing firms. Moreover, large-scale firms are inclined to have low stock price volatilities (Jin & Jorion, 2006; Mian, 1996; Nance et al., 1993), which aid in enhancing firm value.

Aside from the corporate governance and financial statement variables employed, economic conditions during the data period are also considered in this study. Given that our data span 10 years (2005–2014), we include separate year dummies to control intertemporal variations in the market or economic conditions that may affect firm value (Fauver et al., 2003).

**Table 3**  
Censored Panel Data Models with Cash Flow Ratio Variables.<sup>a</sup>

Independent variables	Models			
	(1)	(2)	(3)	(4)
Operating/Sales	-0.0015* (0.0008)			-0.0013 (0.0008)
Investing/(TA-CA)		-0.0003** (0.0001)		-0.0003** (0.0001)
Financing/(LD+TE)			0.0778*** (0.0268)	0.0742*** (0.0268)
Current ratio	-9.87e-06 (9.10e-06)	-9.59e-06 (9.09e-06)	-0.00001 (9.10e-06)	-0.00001 (9.10e-06)
Asset turnover ratio	0.2345*** (0.0204)	0.2330*** (0.0204)	0.2339*** (0.0204)	0.2372*** (0.0204)
Debt ratio	-0.0015*** (0.0006)	-0.0015*** (0.0006)	-0.0018*** (0.0006)	-0.0019*** (0.0006)
Directors' holding ratio	0.0063*** (0.0008)	0.0064*** (0.0008)	0.0063*** (0.0008)	0.0063*** (0.0008)
Managers' holding ratio	0.0097*** (0.0035)	0.0094*** (0.0035)	0.0088** (0.0035)	0.0091*** (0.0035)
Directors' pledge ratio	-0.0023*** (0.0005)	-0.0023*** (0.0005)	-0.0023*** (0.0005)	-0.0023*** (0.0005)
Independent director dummy	-0.0211 (0.0211)	-0.0210 (0.0211)	-0.0209 (0.0211)	-0.0206 (0.0211)
Board size	-0.0532*** (0.0057)	-0.0533*** (0.0057)	-0.0526*** (0.0057)	-0.0527*** (0.0057)
CEO duality dummy	0.1349** (0.0591)	0.1344** (0.0591)	0.1324** (0.0588)	0.1326** (0.0588)
Electronic industry dummy	0.0653 (0.0538)	0.0663 (0.0538)	0.0650 (0.0535)	0.0645 (0.0534)
Firm scale	0.4635*** (0.0115)	0.4624*** (0.0115)	0.4583*** (0.0116)	0.4592*** (0.0116)
2006 dummy	0.0246 (0.0229)	0.0256 (0.0229)	0.0252 (0.0229)	0.0246 (0.0229)
2007 dummy	-0.0405* (0.0229)	-0.0406* (0.0229)	-0.0411* (0.0229)	-0.0412* (0.0229)
2008 dummy	-0.2050*** (0.0227)	-0.2038*** (0.0227)	-0.2050*** (0.0227)	-0.2038*** (0.0227)
2009 dummy	-0.0057 (0.0233)	-0.0051 (0.0233)	-0.0013 (0.0234)	-0.0021*** (0.0234)
2010 dummy	-0.0973*** (0.0233)	-0.0982*** (0.0233)	-0.0987*** (0.0233)	-0.0985*** (0.0233)
2011 dummy	-0.2719*** (0.0224)	-0.2719*** (0.0224)	-0.2737*** (0.0224)	-0.2735*** (0.0224)
2012 dummy	-0.2199*** (0.0226)	-0.2188*** (0.0226)	-0.2169*** (0.0226)	-0.2178*** (0.0226)
2013 dummy	-0.1859*** (0.0231)	-0.1857*** (0.0231)	-0.1840*** (0.0231)	-0.1841*** (0.0231)
2014 dummy	-0.2208*** (0.0233)	-0.2201*** (0.0233)	-0.2186*** (0.0233)	-0.2190*** (0.0233)
Constant	-5.6563*** (0.1916)	-5.6415*** (0.1914)	-5.5656*** (0.1928)	-5.5786*** (0.1930)
Wald chi square	3,462.01	3,456.9	3,466.4	3,472.44
Probability	0.0000	0.0000	0.0000	0.0000

<sup>a</sup> In addition, we also control such as firm risk and information environment. For instance, idiosyncratic risk is a stronger predictor of firm performance and analysts may tend to cover "growth stocks" more than value stocks or analyst coverage may create attention which may lead to higher equity market-to-book ratios (Fang, Noe, & Tice, 2009). The results still hold after including these variables in the base regression as explanatory variables.

In addition, we observe that firm value significantly declined in 2008 because of the financial crisis, as shown that 2008 yearly dummy significantly affects firm. Moreover, yearly dummies were negative after 2010, which might be caused by the competition of Taiwanese enterprises declined in recent years because of the competitiveness enhanced by Korean and Mainland Chinese enterprises. In comparison, the stock price performances in Taiwan might not be superior to those in Korea, Mainland China, Hong Kong, Singapore, and Japan over the data period. As a result, Taiwanese enterprises listed in TWSE might experience a decline in firm value.

$$Tobin's\ q_{i,t} = \beta_0 + \beta_1 X_{j1,t} + \beta_2 current\ ratio_{i,t} + \beta_3 asset\ turnover\ ratio_{i,t} + \beta_4 debt\ ratio_{i,t} + \beta_5 directors'\ holding\ ratio_{i,t}$$

$$+ \beta_6 managers'\ holding\ ratio_{i,t} + \beta_7 directors'\ pledge\ ratio_{i,t} + \beta_8 independent\ director\ dummy_{i,t} + \beta_9 board\ size_{i,t} + \beta_{10} CEO\ duality\ dummy_{i,t} + \beta_{11} electronic\ industry\ dummy_{i,t} + \beta_{12} firm\ scale_{i,t} + \varepsilon_{i,t},\ j = 1, 2, \text{ and } 3.$$

where  $X_{1i,t}$  defines Operating /Sales as  $j=1$ ,  $X_{2i,t}$  defines Investing/(TA-CA) as  $j=2$ , and  $X_{3i,t}$  defines Financing / (LD+TE) as  $j=3$ .

The dependent variable is Tobin's q employed as the proxy for firm value. For the independent variables, we include Operating/Sales, Investing/(TA-CA), and Financing/(LD+TE) separately

and jointly in Models 1–4. In addition, we include board structure that includes directors' holding ratio, managers' holding ratio, directors' pledge ratio, independent director dummy, board size, and CEO duality dummy, financial statement variables that include current assets, asset turnover ratio, and debt ratio, and other variables that include electronic industry dummy, separate year dummies, and firm scale. In addition, we employ censored panel data models for Models 1–4 because of firm–year observations and the characteristics of dependent variable concerned. Standard errors of the estimated coefficients adjusted for robust are shown in parentheses, and statistical significance at 1%, 5%, and 10% levels are denoted by \*\*\*, \*\*, and \*, respectively.

#### 4.3. The effect of capital flow ratio variables to firm values with concerning outliers

For Operating/Sales and Investing/(TA–CA) shown in Table 2, the means and medians of Operating/Sales and Investing/(TA–CA) are –0.0257 and 0.0819, as well as 0.3154 and –0.0927, respectively. The statistical results are affected by outliers because of the minimum value of –858.906 for Operating/Sales and the maximum value of 3277.523 for Investing/(TA–CA).

Thus, to prevent the results from being affected by a small number of firms, we further explore whether firm value would be affected by cash flow variables, such as Operating/Sales, Investing/(TA–CA), and Financing/(LD+TE), by excluding 1% of the outliers on both sides.<sup>3</sup> Thus, we winsorize the dependent and independent variables at 1% and 99% tail in order to minimize the impact of outlier observations, and the results are shown in Table 4.

Table 4 also reveals that Investing/(TA–CA) has a negative effect on firm value, but Financing/(LD+TE) positively affects firm value. Firms investing in capital budgeting projects have cash outflows from investing activities, which enhance firm value. In addition, we deduce that the firms may raise funds for capital budgeting projects, resulting in cash inflows from financing activities and cash outflows from investing activities that enhance firm value.

In addition, we reveal that Operating/Sales is negatively related to firm value. High Operating/Sales may not be regarded as a positive signal because this may emerge from inferior cash management as a result of holding abundant cash or having idle cash. In addition, we also reveal that board structure and financial statement variables have similar findings as those for variables without concerning outliers. Likewise, similar results are shown for electronic industry dummy, yearly dummies, and firm scales.

#### 4.4. The effect of cash flow dummy variables to firm values

Aside from the results revealed using samples without outliers, we employ cash flow dummies, including operating, investing, and financing dummies<sup>4</sup>, for further investigation. The results may not be affected by the use of dummy variables for replacing outliers instead of excluding outliers. After examining whether cash flow dummies would affect firm value, we present the results in Table 5.

Table 5 reveals that the investing dummy does not significantly affect firm value, but is negatively related to firm value, indicating that cash outflows from investing would be positively related to firm value. In addition, we also reveal that the operating dummy negatively affects firm value, which is similar to the relationship

<sup>3</sup> According to the distribution of the variables employed, we set 1% outliers at the left side and 1% at the right side, i.e., “2% excluded”.

<sup>4</sup> Operating dummy is set to 1 if cash flow from operating activities is positive; otherwise, 0. Similarly, investing dummy is set to 1 if cash flow from investing activities is positive; otherwise, 0. Financing dummy is set to 1 if cash flow from financing activities is positive; otherwise, 0.

between Operating/Sales and firm value. By contrast, the financing dummy positively affects firm value, which is the same as the relationship between Financing/(LD+TE) and firm value, as shown in Tables 3 and 4.

Regarding the variables related to corporate governance, financial statements, and other controlling variables that include electronic industry dummy, yearly dummies, and firm scales, we reveal similar results as those shown in Table 4. Our results are robust after employing cash flow dummies, cash flow variables, and cash flow variables excluding outliers.

$$\begin{aligned} \text{Tobin's } q_{i,t} = & \beta_0 + \beta_1 X_{j1,t} + \beta_2 \text{current ratio}_{i,t} \\ & + \beta_3 \text{asset turnover ratio}_{i,t} + \beta_4 \text{debt ratio}_{i,t} \\ & + \beta_5 \text{directors' holding ratio}_{i,t} \\ & + \beta_6 \text{managers' holding ratio}_{i,t} \\ & + \beta_7 \text{directors' pledge ratio}_{i,t} \\ & + \beta_8 \text{independent director dummy}_{i,t} + \beta_9 \text{board size}_{i,t} \\ & + \beta_{10} \text{CEO duality dummy}_{i,t} \\ & + \beta_{11} \text{electronic industry dummy}_{i,t} + \beta_{12} \text{firm scale}_{i,t} \\ & + \varepsilon_{i,t}, j = 1, 2, \text{ and } 3. \end{aligned}$$

where  $X_{1i,t}$  defines operating dummy as  $j=1$ ,  $X_{2i,t}$  defines investment dummy as  $j=2$ , and  $X_{3i,t}$  defines financing dummy as  $j=3$ .

The dependent variable is Tobin's  $q$  employed as the proxy for firm value. As independent variables, we include operating dummy, investment dummy, financing dummy separately and jointly in Models 5–8, respectively. In addition, we include board structure that includes directors' holding ratio, managers' holding ratio, directors' pledge ratio, independent director dummy, board size, and CEO duality dummy, financial statements variables that include current assets, asset turnover ratio, and debt ratio, and other variables that include electronic industry dummy, separate year dummies, and firm scale. In addition, we employ censored panel data models for Models 5–8 because of firm–year observations and the characteristics of dependent variable concerned. Standard errors of the estimated coefficients adjusted for robust are shown in parentheses, and statistical significance at 1%, 5%, and 10% levels are denoted by \*\*\*, \*\*, and \*, respectively.

## 5. Conclusion

Despite the requirement for cash flow statements, debates continue on the usefulness of the information contained in these statements (Barton et al., 2010; Kumar & Krishnan, 2008; Subramanyam & Venkatachalam, 2007). In this study, we explore the relationship between the informativeness of cash flow statements and firm value. Regarding the format for cash flow statements including by direct and indirect methods (Drtna & Largay, 1985; Krishnan & Largay, 2000), cash flows are classified into the following general classifications: cash flows from operating activities, investing activities, and financing activities.

In this study, in comparing cash flow ratio variables that include Operating/Sales, Investing/(TA–CA), and Financing/(LD+TE), Investing/(TA–CA) is found to be positively related to firm value, indicating that firms with cash outflows from investing activities can increase their firm value. These cash outflows that emerge from searching for favorable capital budgeting projects can aid in enhancing firm value. In addition, we show that Financing/(LD+TE) positively affects firm value. Firms raising funds for capital budgeting projects can, therefore, obtain cash inflows from financing activities and cash outflows from investing activities.

**Table 4**  
Censored Panel Data Models with Concerning Outliers.

Independent variables	Models			
	(1) 1% excluded	(2) 1% excluded	(3) 1% excluded	(4) 1% excluded
Operating/sales	−0.0183 (0.0402)			−0.0856* (0.0456)
Investing/(TA−CA)		−0.0585** (0.0234)		−0.0724*** (0.0256)
Financing/(LD+TE)			0.1103*** (0.0379)	0.1125** (0.0449)
Current ratio	6.22e-06 (0.00001)	−0.00001 (9.11e-06)	−0.00001 (8.89e-06)	−0.00001 (0.00001)
Asset turnover ratio	0.2372*** (0.0208)	0.2336*** (0.0207)	0.2337*** (0.0201)	0.2321*** (0.0206)
Debt ratio	−0.0019*** (0.0006)	−0.0015** (0.0006)	−0.0022*** (0.0006)	−0.0021*** (0.0007)
Directors' holding ratio	0.0068*** (0.0008)	0.0062*** (0.0008)	0.0065*** (0.0008)	0.0064*** (0.0008)
Managers' holding ratio	0.0107*** (0.0036)	0.0090*** (0.0035)	0.0148** (0.0036)	0.0143*** (0.0037)
Directors' pledge ratio	−0.0024*** (0.0005)	−0.0023*** (0.0005)	−0.0022*** (0.0004)	−0.0023*** (0.0004)
Independent director dummy	−0.0213 (0.0213)	−0.0241 (0.0210)	−0.0189 (0.0204)	−0.0218 (0.0204)
Board size	−0.0551*** (0.0058)	−0.0529*** (0.0057)	−0.0535*** (0.0056)	−0.0544*** (0.0056)
CEO duality dummy	0.1349** (0.0600)	0.1266** (0.0576)	0.1438** (0.0596)	0.1365** (0.0581)
Electronic industry dummy	0.0583 (0.0546)	0.0540 (0.0524)	0.0560 (0.0542)	0.0387 (0.0529)
Firm scale	0.4825*** (0.0121)	0.4534*** (0.0118)	0.4798*** (0.0115)	0.4716*** (0.0121)
2006 dummy	0.0237 (0.0232)	0.0138 (0.0229)	0.0118 (0.0221)	0.0020 (0.0223)
2007 dummy	−0.0464** (0.0233)	−0.0427* (0.0230)	−0.0586*** (0.0222)	−0.0635*** (0.0225)
2008 dummy	−0.2035*** (0.0231)	−0.2059*** (0.0227)	−0.2062*** (0.0221)	−0.2084*** (0.0223)
2009 dummy	−0.0107 (0.0237)	−0.0034 (0.0233)	−0.0209 (0.0226)	−0.0129 (0.0229)
2010 dummy	−0.1033*** (0.0236)	−0.0868*** (0.0233)	−0.1082*** (0.0225)	−0.1004*** (0.0227)
2011 dummy	−0.2739*** (0.0228)	−0.2677*** (0.0225)	−0.2762*** (0.0217)	−0.2693*** (0.0220)
2012 dummy	−0.2257*** (0.0229)	−0.2091*** (0.0226)	−0.2340*** (0.0218)	−0.2219*** (0.0220)
2013 dummy	−0.1929*** (0.0235)	−0.1771*** (0.0232)	−0.1948*** (0.0224)	−0.1838*** (0.0227)
2014 dummy	−0.2231*** (0.0237)	−0.2108*** (0.0233)	−0.2307*** (0.0225)	−0.2170*** (0.0228)
Constant	−5.9298*** (0.1991)	−5.5090*** (0.1952)	−5.8810*** (0.0036)	−5.7627*** (0.1988)
Wald chi square	3,445.63	3,331.25	3,759.95	3,618.90
Probability	0.0000	0.0000	0.0000	0.0000

The dependent variable is Tobin's q employed as the proxy for firm value. As independent variables, we include Operating/Sales, Investing/(TA−CA), and Financing/(LD+TE) separately and jointly in Models 1–4, respectively. In addition, we include board structure that includes directors' holding ratio, managers' holding ratio, directors' pledge ratio, independent director dummy, board size, and CEO duality dummy, financial statements variables that include current assets, asset turnover ratio, and debt ratio, and other variables that include electronic industry dummy, separate year dummies, and firm scale. In addition, we employ censored panel data models for Models 1–4 because of firm-year observations and the characteristics of dependent variable concerned. Standard errors of the estimated coefficients adjusted for robust are shown in parentheses, and statistical significance at 1%, 5%, and 10% levels are denoted by \*\*\*, \*\*, and \*, respectively.

Cash inflows from operating activities may not be regarded as a positive signal for Taiwanese enterprise. In fact, due to the more and more competition faced by Taiwanese enterprise, positive cash flows from operations might be caused by either cash inflows from accounts receivable collected due to higher sale discount provided or cash inflows from inventory due to lowering down selling price, which might not be regarded as positive signals. Moreover, cash outflows from accounts payable are declined since purchases fall due to more and more competitors from Korea and China. As a result, different from our cognitions that higher cash inflows from operating activities might enhance firm value, we

realize that cash flows from operations might not regard as positive signals in Taiwan due to the inference mentioned above.

This study may contribute to existing literature in several aspects. First, we argue that cash flow management would be an essential issue for enterprises. We then explored cash flows from operating, investing, and financing activities in accordance with the general classification of cash flow statements.<sup>5</sup> Second, examining

<sup>5</sup> Operating, investing, and financing activities are classified by either the direct or indirect method of cash flow statements.



**Table 5**  
Censored Panel Data Models with Cash Flow Dummy Variables.<sup>a</sup>

Models Independent variables	(5)	(6)	(7)	(8)
Operating dummy	-0.0318** (0.0150)			-0.0292* (0.0159)
Investment dummy		-0.0217 (0.0145)		-0.0197 (0.147)
Financing dummy			0.0309*** (0.0117)	0.0231* (0.0124)
Current ratio	-9.57e-06 (9.10e-06)	-9.67e-06 (9.10e-06)	-0.00001 (9.10e-06)	-0.00001 (9.10e-06)
Asset turnover ratio	0.2355*** (0.0204)	0.2317*** (0.0204)	0.2339*** (0.0204)	0.2343*** (0.0204)
Debt ratio	-0.0016*** (0.0006)	-0.0016*** (0.0006)	-0.0018*** (0.0006)	-0.0019*** (0.0006)
Directors' holding ratio	0.0063*** (0.0008)	0.0063*** (0.0008)	0.0063*** (0.0008)	0.0063*** (0.0008)
Managers' holding ratio	0.0094*** (0.0035)	0.0094*** (0.0035)	0.0092*** (0.0034)	0.0092*** (0.0035)
Directors' pledge ratio	-0.0023*** (0.0005)	-0.0023*** (0.0005)	-0.0023*** (0.0005)	-0.0023*** (0.0005)
Independent director dummy	-0.0218 (0.0211)	-0.0214 (0.0211)	-0.0223 (0.0211)	-0.0225 (0.0211)
Board size	-0.0528*** (0.0057)	-0.0534*** (0.0057)	-0.0529*** (0.0057)	-0.0528*** (0.0057)
CEO duality dummy	0.1335** (0.0590)	0.1344** (0.0590)	0.1331** (0.0589)	0.1324** (0.0588)
Electronic industry dummy	0.0670 (0.0537)	0.0652 (0.0537)	0.0657 (0.0536)	0.0656 (0.0537)
Firm scale	0.4629*** (0.0115)	0.4612*** (0.0116)	0.4602*** (0.0115)	0.4599*** (0.0116)
2006 dummy	0.0249 (0.0402)	0.0251 (0.0229)	0.0252 (0.0229)	0.0246 (0.0229)
2007 dummy	-0.0413* (0.0229)	-0.0413* (0.0229)	-0.0418* (0.0229)	-0.0429* (0.0229)
2008 dummy	-0.2052*** (0.0227)	-0.2067*** (0.0228)	-0.2063*** (0.0227)	-0.2077*** (0.0228)
2009 dummy	-0.0049*** (0.0233)	-0.0056 (0.0234)	-0.0016 (0.0234)	-0.0029*** (0.0234)
2010 dummy	-0.0995*** (0.0233)	-0.0982*** (0.0233)	-0.0993*** (0.0233)	-0.1010*** (0.0233)
2011 dummy	-0.2744*** (0.0225)	-0.2734*** (0.0224)	-0.2741*** (0.0224)	-0.2768*** (0.0225)
2012 dummy	-0.2198*** (0.0226)	-0.2199*** (0.0226)	-0.2175*** (0.0226)	-0.2195*** (0.0226)
2013 dummy	-0.1868*** (0.0231)	-0.1863*** (0.0231)	-0.1838*** (0.0231)	-0.1855*** (0.0232)
2014 dummy	-0.2221*** (0.0233)	-0.2210*** (0.0233)	-0.2194*** (0.0233)	-0.2218*** (0.0233)
Constant	-5.6199*** (0.1916)	-5.6128*** (0.1925)	-5.6066*** (0.1916)	-5.5705*** (0.1926)
Wald chi square	3,462.01	3,456.9	3,466.4	3,472.44
Probability	0.0000	0.0000	0.0000	0.0000

<sup>a</sup> In fact, high-quality management would also result in the higher firm value. In this case, manager quality is unobservable and correlated with both dependent and independent variables. Thus, cash follows will be correlated with firm value; however, the better firm value is not due to better cash flows. In order to circumvent this problem, firm fixed effects can be used as an endogeneity control in order to confirm the cause and effect relationship. After taking fix effects panel data model, the results still show that operating dummy is negatively related to firm value.

the effects of cash flow statements to firm value would provide valuable information to enterprises, especially that this issue seems seldom discussed in existing literature. The rare discussion of this issue may result in cash inflows from operating activities regarded as a beneficial signal for enterprises. However, this study provides the results contradicted to our cognitions. Third, we reveal that firms with positive cash flows from operating activities may not be regarded as a positive signal since the market is increasingly competitive for Taiwanese enterprises due to more and more competitors from South Korea and China. As a result, firm value is unlikely enhanced if cash inflows from operating resulting from sales increased due to lower profit margin or purchases shrunk owing to market share declined.

This study has two valuable implications. First, market participants might not consider that cash inflows from operating activities

would be as a positive signal if cash inflows from operating result from international competitiveness declined for enterprises. Second, essential issues including capital budgeting, capital structure, and working capital management in term of corporate finance should be further examined by cash flow statements because the soundness of cash flow statements would be closely related to financial management and even firm value. Besides, we would further investigate if there are differences between Taiwan and U.S. in term of the effect of cash flows from these activities to firm value.

#### Acknowledgment

The authors wish to thank the editor, Professor Boubakri, and the referee for their constructive and helpful comments that con-

tributed to improving the quality of this paper. Any remaining errors are our own responsibility.

## References

- Acharya, V., Davydenko, S. A., & Strebulaev, I. A. (2012). Cash holdings and credit risk. *Review of Financial Studies*, 25(12), 3572–3609.
- Ahmed, K., Hossain, M., & Adams, M. B. (2006). The effects of board composition and board size on the informativeness of annual accounting earnings. *Corporate Governance: An International Review*, 14(5), 418–431.
- Akbar, S., Shah, S. Z. A., & Stark, A. W. (2011). The value relevance of cash flows, current accruals, and non-current accruals in the UK. *International Review of Financial Analysis*, 20(5), 311–319.
- Aktas, N., Croci, E., & Petmezas, D. (2015). Is working capital management value-enhancing? Evidence from firm performance and investments. *Journal of Corporate Finance*, 30, 98–113.
- Ammann, M., Oesch, D., & Schmid, M. M. (2011). Corporate governance and firm value: International evidence. *Journal of Empirical Finance*, 18(1), 36–55.
- Artakis, P. G., & Papanastasiopoulos, G. A. (2016). Implications of the cash component of earnings for earnings persistence and stock returns. *The British Accounting Review*, 48(2), 117–133.
- Aziz, A., & Lawson, G. H. (1989). Cash-flow reporting and financial distress models: Testing of hypotheses. *Financial Management*, 18(1), 55–63.
- Aziz, A., Emanuel, D. C., & Lawson, G. H. (1988). Bankruptcy prediction—An investigation of cash-flow based models. *Journal of Management Studies*, 25(5), 419–437.
- Badertscher, B. A., Collins, D. W., & Lys, T. Z. (2012). Discretionary accounting choices and the predictive ability of accruals with respect to future cash flows. *Journal of Accounting and Economics*, 53(1), 330–352.
- Banker, R. D., Byzalov, D., Ciftci, M., & Mashruwala, R. (2014). The moderating effect of prior sales changes on asymmetric cost behavior. *Journal of Management Accounting Research*, 26(2), 221–242.
- Barth, M. E., Cram, D. P., & Nelson, K. K. (2001). Accruals and the prediction of future cash flows. *The Accounting Review*, 76(1), 27–58.
- Barton, J., & Simko, P. J. (2002). The balance sheet as an earnings management constraint. *The Accounting Review*, 77(1), 1–27.
- Barton, J., Hansen, B., & Pownall, G. (2010). Which performance measures do investors around the world value the most – and why? *The Accounting Review*, 85(3), 753–789.
- Bauer, R., Braun, R., & Clark, G. L. (2008). The emerging market for European corporate governance: The relationship between governance and capital expenditures, 1997–2005. *Journal of Economic Geography*, 8(4), 441–469.
- Bauguess, S. W., Moeller, S. B., Schlingemann, F. P., & Zutter, C. J. (2009). Ownership structure and target returns. *Journal of Corporate Finance*, 15(1), 48–65.
- Beaver, W. H. (1966). Financial ratios as predictors of failure. *Journal of Accounting Research*, 4, 71–127.
- Belo, F., & Lin, X. (2012). The inventory growth spread. *Review of Financial Studies*, 25(1), 278–313.
- Berkman, H., & Bradbury, M. E. (1996). Empirical evidence on the corporate use of derivatives. *Financial Management*, 25(2), 5–13.
- Black, B., & Kim, W. (2012). The effect of board structure on firm value: A multiple identification strategies approach using Korean data. *Journal of Financial Economics*, 104(1), 203–226.
- Black, B. S., Kim, W., Jang, H., & Park, K. S. (2015). How corporate governance affect firm value? Evidence on a self-dealing channel from a natural experiment in Korea. *Journal of Banking & Finance*, 51, 131–150.
- Block, S. B., & Gallagher, T. J. (1986). The use of interest rate futures and options by corporate financial managers. *Financial Management*, 15(3), 73–78.
- Blum, M. (1974). Failing company discriminant analysis. *Journal of Accounting Research*, 12(1), 1–25.
- Borokhovich, K. A., Brunarski, K. R., Crutchley, C. E., & Simkins, B. J. (2004). Board composition and corporate use of interest rate derivatives. *Journal of Financial Research*, 27(2), 199–216.
- Bowen, R. M., Burgstahler, D., & Daley, L. (1986). Evidence on the relationships between earnings and various measures of cash flow. *The Accounting Review*, 61(4), 713–725.
- Brown, L. D., & Caylor, M. L. (2006). Corporate governance and firm valuation. *Journal of Accounting and Public Policy*, 25(4), 409–434.
- Cai, J., & Zhang, Z. (2011). Leverage change, debt overhang, and stock prices. *Journal of Corporate Finance*, 17(3), 391–402.
- Casey, C. J., & Bartczak, N. J. (1984). Cash-flow – Its not the bottom line. *Harvard Business Review*, 62(4), 61–66.
- Casey, C. J., & Bartczak, N. J. (1985). Using operating cash flow data to predict financial distress: Some extensions. *Journal of Accounting Research*, 23(1), 384–401.
- Chhaochharia, V., & Grinstein, Y. (2007). Corporate governance and firm value: The impact of the 2002 governance rules. *The Journal of Finance*, 62(4), 1789–1825.
- Chi, C. W., Hung, K., Cheng, H. W., & Lieu, P. T. (2015). Family firms and earnings management in Taiwan: Influence of corporate governance. *International Review of Economics & Finance*, 36, 88–98.
- Chiang, M. H., & Lin, J. H. (2007). The relationship between corporate governance and firm productivity: Evidence from Taiwan's manufacturing firms. *Corporate Governance: An International Review*, 15(5), 768–779.
- Cochran, P. L., Wood, R. A., & Jones, T. B. (1985). The composition of boards of directors and incidence of golden parachutes. *Academy of Management Journal*, 28(3), 664–671.
- Deakin, E. B. (1972). A discriminant analysis of predictors of business failure. *Journal of Accounting Research*, 10(1), 167–179.
- Dechow, P. M., Kothari, S. P., & Watts, R. L. (1988). The relation between earnings and cash flows. *Journal of Accounting and Economics*, 25(2), 133–168.
- Dickinson, V. (2011). Cash flow patterns as a proxy for firm life cycle. *The Accounting Review*, 86(6), 1969–1994.
- Drtna, R. E., & Largay, J. A., III. (1985). Pitfalls in calculating cash flow from operations. *Accounting Review*, 314–326.
- Eisenberg, T., Sundgren, S., & Wells, M. T. (1998). Larger board size and decreasing firm value in small firms. *Journal of Financial Economics*, 48(1), 35–54.
- Fahlenbrach, R., & Stulz, R. M. (2009). Managerial ownership dynamics and firm value. *Journal of Financial Economics*, 92(3), 342–361.
- Fang, V. W., Noe, T. H., & Tice, S. (2009). Stock market liquidity and firm value. *Journal of Financial Economics*, 94(1), 150–169.
- Fauver, L., Houston, J., & Naranjo, A. (2003). Capital market development, international integration, legal systems, and the value of corporate diversification: A cross-country analysis. *Journal of Financial and Quantitative Analysis*, 38(1), 135–158.
- Gentry, J. A., Newbold, P., & Whitford, D. T. (1985). Classifying bankrupt firms with fund flows complements. *Journal of Accounting Research*, 23(1), 146–160.
- Gentry, J. A., Newbold, P., & Whitford, D. T. (1987). Fund flow components, financial ratios, and bankruptcy. *Journal of Business Finance and Accounting*, 14(1), 595–606.
- Gilbert, L. R., Menon, K., & Schwartz, K. B. (1990). Predicting bankruptcy for firms in financial distress. *Journal of Business Finance and Accounting*, 17(1–2), 161–171.
- Gonzalez, A., & André, P. (2014). Board effectiveness and short-termism. *Journal of Business Finance & Accounting*, 41(1–2), 185–209.
- Greenberg, R. R., Johnson, G. L., & Ramesh, K. (1986). Earnings versus cash flow as a predictor of future cash flow measures. *Journal of Accounting, Auditing & Finance*, 1(4), 266–277.
- Haque, F. (2017). The effects of board characteristics and sustainable compensation policy on carbon performance of UK firms. *The British Accounting Review*, 49(3), 347–364.
- Hardwick, P., Adams, M., & Zou, H. (2011). Board characteristics and profit efficiency in the United Kingdom life insurance industry. *Journal of Business Finance & Accounting*, 38(7–8), 987–1015.
- Howe, K. M., He, J., & Kao, G. W. (1992). One-time cash flow announcements and free cash-flow theory: Share repurchases and special dividends. *The Journal of Finance*, 47(5), 1963–1975.
- Jackling, B., & Johl, S. (2009). Board structure and firm performance: Evidence from India's top companies. *Corporate Governance: An International Review*, 17(4), 492–509.
- Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 4, 305–360.
- Jin, Y., & Jorion, P. (2006). Firm value and hedging: Evidence from U.S. oil and gas producers. *Journal of Finance*, 61(2), 893–919.
- Judge, W. Q., Naoumova, L., & Koutzevol, N. (2003). Corporate governance and firm performance in Russia: An empirical study. *Journal of World Business*, 38(4), 385–396.
- Kaplan, S. N., & Zingales, L. (1997). Do investment-cash flow sensitivities provide useful measures of financing constraints? *The Quarterly Journal of Economics*, 69–215.
- Kiel, G. C., & Nicholson, G. J. (2003). Board composition and corporate performance: How the Australian experience informs contrasting theories of corporate governance. *Corporate Governance: An International Review*, 11(3), 189–205.
- Krishnan, G. V., & Largay, J. A., III. (2000). The predictive ability of direct method cash flow information. *Journal of Business Finance & Accounting*, 27(1–2), 215–245.
- Kumar, K. R., & Krishnan, G. V. (2008). The value-relevance of cash flows and accruals: The role of investment opportunities. *The Accounting Review*, 83(4), 997–1040.
- Laitinen, E. K. (2006). Financial statement data in assessing the future potential of a technology firm: The case of Nokia. *International Review of Financial Analysis*, 15(3), 256–286.
- Laswad, F., & Baskerville, R. F. (2007). An analysis of the value of cash flow statements of New Zealand pension schemes. *The British Accounting Review*, 39(4), 347–355.
- Lee, T. S., & Yeh, Y. H. (2004). Corporate governance and financial distress: Evidence from Taiwan. *Corporate Governance: An International Review*, 12(3), 378–388.
- Lemmon, M. L., & Lins, K. V. (2003). Ownership structure, corporate governance, and firm value: Evidence from the East Asian financial crisis. *The Journal of Finance*, 58(4), 1445–1468.
- Lemmon, M., Liu, L. X., Mao, M. Q., & Nini, G. (2014). Securitization and capital structure in nonfinancial firms: An empirical investigation. *The Journal of Finance*, 69(4), 1787–1825.
- Livnat, J., & Zarowin, P. (1990). The incremental information content of cash-flow components. *Journal of Accounting and Economics*, 13(1), 25–46.
- Louis, H., & White, H. (2007). Do managers intentionally use repurchase tender offers to signal private information? Evidence from firm financial reporting behavior. *Journal of Financial Economics*, 85(1), 205–233.
- McConnell, J. J., & Muscarella, C. J. (1985). Corporate capital expenditure decisions and the market value of the firm. *Journal of Financial Economics*, 14(3), 399–422.

- Mehran, H. (1995). Executive compensation structure, ownership, and firm performance. *Journal of Financial Economics*, 38(2), 163–184.
- Mian, S. L. (1996). Evidence on corporate hedging policy. *Journal of Financial and Quantitative Analysis*, 31, 419–439.
- Nance, D. R., Smith, C. W., & Smithson, C. W. (1993). On the determinants of corporate hedging. *The Journal of Finance*, 48(1), 267–281.
- Ni, Y., & Huang, P. (2015). Do IPOs matter for price limits? Evidence from Taiwan. *The Quarterly Review of Economics and Finance*, 58, 74–83.
- Nini, G., Smith, D. C., & Sufi, A. (2012). Creditor control rights, corporate governance, and firm value. *Review of Financial Studies*, 25(6), 1713–1761.
- O'Connell, V., & Cramer, N. (2010). The relationship between firm performance and board characteristics in Ireland. *European Management Journal*, 28(5), 387–399.
- Subramanyam, K. R., & Venkatachalam, M. (2007). Earnings, cash flows, and ex-post intrinsic value of equity. *The Accounting Review*, 82(2), 457–481.
- Villalonga, B., & Amit, R. (2006). How do family ownership, control and management affect firm value? *Journal of Financial Economics*, 80(2), 385–417.
- Wahab, N. S. A., & Holland, K. (2012). Tax planning, corporate governance and equity value. *The British Accounting Review*, 44(2), 111–124.
- Yermack, D. (1996). Higher market valuation of companies with a small board of directors. *Journal of Financial Economics*, 40(2), 185–211.