

Relationship Between Intangible Assets and Cash Flows: An Empirical Analysis of Publicly Listed Corporations in the Philippines

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— *Review of* —
**Integrative
Business &
Economics**
— *Research* —

ABSTRACT

Businesses have recognized the importance of intangible assets in improving their financial performance, creating value, and maintaining competitiveness. Yet, a number of corporate entities have remained indifferent about investing on intangibles and recognizing their economic benefits. This study examined the economic benefits derived by 140 (out of 264) publicly listed corporations in the Philippines with intangible assets shown on their financial statements from 2010 to 2013. Using the Ordinary Least Square Cross-Section Regression Method and panel regression, results showed that intangible assets impact significantly on total cash flow (91.07%) and cash flow from investing activities (68.13%), operating activities (29.56%), and financing activities (6.07%). Based on z-scores, the study noted that the impact of intangible assets on cash flow is significantly different across these sectors: financial; holding companies; services; and industrial, mining, and oil. Essentially, businesses have to consider the specific sector where they belong in coming up with sound business decisions pertaining to intangible assets.

Keywords: Intangible assets, goodwill, cash flow, operating activities, financing activities, investing activities

JEL Codes: M41, M480, G38

1. INTRODUCTION

In the modern business era, intangible assets are vital strategic resources. They are extremely important in creating corporate value (Chareonsuk & Chansa-ngavej, 2008; Gamayuni, 2015) and improving company performance (Grimaldi & Cricelli, 2009; Gamayuni, 2015). Flignor and Orozco (2006) indicated that intangible assets abound throughout the business world, touching nearly all aspects of a company, from product development to human capital, and staff functions such as legal, accounting, finance, and line operations such as research and development, marketing, and general management. Following the resource-based view of a firm, Villalonga (2004) proved that intangible assets play an effective role in sustaining the competitive advantage of a business. Meanwhile, Capasso (2004) articulated that knowledge-based assets are promising as a source of the sustainable advantage because firm-specificity, social complexity, and causal ambiguity make them hard for rivals to imitate. This manifestation agrees with the competitive advantage which intangible assets can potentially provide to firms as espoused by Mehta and Madhani (2008). For these reasons, Metha and Madhani (2008) underscored that “governments have started

highlighting the importance of intangibles in a country's economy and encouraging firms to pay high attention to their intangible assets."

Indeed, intangible assets are key drivers of economic growth in most countries (Gu & Lev, 2003). Brynjolfsson, Hitt, and Yang (1998) stated that in developed economies, production not only requires the traditional factors like capital and labor, but also intangible assets like skills, organizational structures, know-how, information, and other similar factors. This is particularly true in industries like pharmaceuticals, software, aviation, and financial services. Clearly, intangible assets in the form of knowledge, learning, and innovation are sources of competitive advantage and power of modern business organizations. Education and research organizations have intangible asset creation at the core of their mission (Secundo, Margherita, Wlia & Passiante, 2010). For these entities, identifying and measuring intellectual capital are an operational priority and are necessary to align strategic orientation and performance.

On a macro scenario, investments in intangible assets have grown rapidly among companies in the United States, Japan, and Europe. Such growth has been amplified by intensified global competition, use of information and communication technologies, adoption of new business models, and prevalence of the services sector. The report of the Organization for Economic Cooperation and Development (OECD, 2011) cited that such investments have a significant impact on productivity. It also indicated that in some cases the investments match or exceed those in the traditional capital such as machinery, equipment, and buildings.

Given the noteworthy contributions of intangible assets to companies and the economy, why do some companies not have them in their financial statements? A case in point is the Philippine Stock Exchange where only 140 (53.85%) of the 264 publicly listed corporations have intangible assets on their financial statements during a four-year period (2010-2014). On a sectoral basis, the financial sector registered the highest percentage (80.65%) while the property sector registered the lowest percentage (41.03%) of entities with intangible assets shown in the financial statements (Table 1). This raises the issue of whether intangible assets impact on the value creation of the entities that have them.

Table 1. Number of Entities with Intangible Assets per Sector

| Sector | Total Number of Entities | Entities with Intangible Assets | % |
|-----------------------------|--------------------------|---------------------------------|-------|
| Financial | 31 | 25 | 80.65 |
| Property | 39 | 16 | 41.03 |
| Holding companies | 40 | 19 | 47.50 |
| Services | 63 | 31 | 49.21 |
| Industrial, Mining, and Oil | 91 | 49 | 53.85 |
| Total | 264 | 140 | 53.03 |

The Philippine situation where only half of the publicly listed corporations have intangible assets has motivated this researcher to examine the relationship between intangible assets and the economic benefits derived by the said corporations. The

relationship of variables was exemplified by the impact of intangible assets on the cash flow generation. Thus, this study seeks to answer the question “What is the impact of intangible assets on the cash flow of publicly listed corporations in the Philippines?” It aims to provide evidence on the extent to which intangible assets contribute to the generation of cash of the publicly listed corporations. Relatedly, this study contributes to the existing literature by providing an empirical basis to conclude that intangible assets impact on firm’s cash flows.

2. RELATED LITERATURE

A number of studies have dealt on how investments in intangible assets influence **firm performance**. Mehta and Madhani (2008) upheld that performance of firms is highly dependent on various forms of intangible assets such as customer and supplier relationship, the performance of employees, and brand quality. Besides, intangible assets are key performance indicators of a firm’s profitability and future performance sustainability. Russel (2014) found out that intangible assets are associated with the performance of Australian firms, specifically on executive bonus plans, share issue, leverage, and class of assets. In a study of 271 companies in Turkey, Kumlu (2014) found out that intangible resources, competitive export strategies, and perceived export performance all have positive relationship.

The other prevalent benefits derived from intangible assets deal with enhancing the company’s productivity. This was stipulated by the reports of both the UK Commission for Employment and Skills (2011) and the Department for Business, Innovation, and Skills of London Economics (2012). The former report indicated the significant positive association of intangible assets with productivity, highlighting that firms with higher proportion of intangible assets are likely to be productive. The same report covered a sectoral analysis and revealed that productivity is rising faster on sectors where intangible assets make a relatively large contribution to productivity growth. The latter report disclosed that various elements of intangible assets demonstrate direct impact on productivity, although economic competencies like human capital and skills have bigger roles in enhancing productivity.

It should be generally understood that business and industry have to identify and locate the intangible assets in their functional departments and establish how they contribute to the competitiveness of the organization (Chareonsuk & Chansa-ngavej, 2008). This is consistent with Villalonga (2004) who had proven that the greater the intangibility of a firm’s resources, the greater the sustainability of its competitive advantage.

Intellectual capital, a form of intangible assets, shows a high prospect of being an indicator of future financial performance as it is important in enhancing the firm profitability and revenue growth (Chen, Cheng, & Hwang, 2005). Moreover, it has a positive impact on market value of the firm. Chen et al. (2005) also found out that intangible assets in the form of research and development expenditures have a positive effect on firm value and profitability. Tan, Plowman, and Hancock (2007) noted that intellectual capital is related to company performance and future company performance based on a study of 150 companies listed on the Singapore Exchange. Studies also

found out that the contribution of intellectual capital to company performance differs by industry (Tan et al., 2007; Chareonsuk & Chansa-ngavej 2008).

In summary, studies on intangible assets refer to a variety of economic benefits ranging from financial performance measures, specifically profitability and revenue growth to productivity and sustainability. Not much has been written about how investment in intangible assets could impact on the cash generating activities of a business. As Mullins and Komisar (2009) noted, “Cash is king and thinking strategically about cash and cash flow is the key to keep the business moving.”

3. RESEARCH FRAMEWORK

This study instigates the provisions of International Accounting Standards (IAS) Number 38 which defines an intangible asset as “an identifiable, non-monetary asset without physical substance” (Ernst & Young, 2013). In addition, it espouses that an asset is a resource of an entity that satisfies two attributes: control and economic benefits. Correspondingly, an item is an asset if it is controlled by the entity as a result of past events and therefore such entity has the power to obtain future economic benefits. In addition, an intangible asset is identifiable, which means that it “is capable of being separated or divided from the entity and sold, transferred, licensed, rented or exchanged” (Melville, 2014). IAS 29 defines monetary items as “money held and items to be received or paid in money.” Specifically, monetary items are units of currency held and assets to be received and liabilities to be paid in a fixed or determinable number of units of currency. Thus, intangible assets are non-monetary.

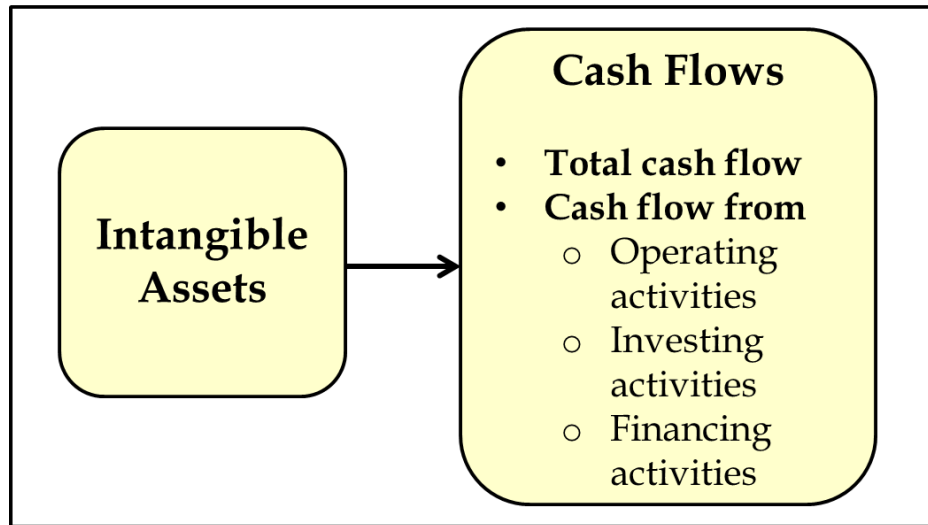
Essentially, businesses are concerned about how intangible assets result in economic benefits and thus create value for the firm. Economic benefits are varied in form and range from revenue and profit generation, cash flow, earnings per share, share value, and the like. This study focuses on the cash flow of the subject entities and adopts three types of cash flows based on IAS Number 7 (Statement of Cash Flows). Cash flow from operating activities comes from the principal revenue-producing activities of the entity. On the other hand, cash flow from investing activities entails the acquisition and disposal of long-term assets and other investments not included in the cash account of the entity. Lastly, cash flow from financing activities results in changes in the size and composition of the contributed equity and borrowings of the entity.

Consequently, the research framework denotes the relationship between intangible assets (independent variable) and cash flows (dependent variables), categorized into operating, investing, and financing (Figure 1).

4. METHODS OF DATA GATHERING AND ANALYSIS

4.1 Data Sources. The researcher obtained data on intangible assets and cash flows from the financial statements of the 140 corporations mainly from the website of the Philippine Stock Exchange (PSE). A total of 560 financial statements covering four years (2010-2013) were used as the basis of the study. Company websites and other secondary sources such as The Wall Street Journal and Businessweek websites provided additional data.

Figure 1: Relationship of Intangible Assets and Cash Flows



4.2 Methods of Data Analysis. The researcher applied normality test using both the **linear probability plots** for normal distribution and the **Anderson-Darling test**. The linear normal probability plots showed that all of the variables do not fit the normal probability line indicating that the datasets do not follow a normal distribution. Likewise, all data sets fail to meet the requirement of the Anderson-Darling test. This means that the data cannot be fitted in a normal probability distribution model. Therefore, the **Ordinary Least Square (OLS)** Cross-Section Regression Method was used. In this method, the researcher formulated a model for each of the four dependent variables in each of the five sectors, with separate models for all sectors (N=140). This was done on a yearly basis resulting in a total of 96 models. All models follow the regression equation below:

$$y_{\alpha} = \beta_0 + \beta_1 \times \text{intangible assets} + u_i$$

where: y_{α} = dependent variable with α representing operating, investing, financing, or total cash flow;

β_0 = coefficient of the dependent variable;

β_1 = coefficient of the variable for intangible assets (independent variable);

u_i = error/disturbance term.

The regression resulted in some invalid models due to heteroskedasticity and errors in the normality of residuals. Thus, the researcher excluded such results in the analysis. Subsequently, the **panel regression** was used. In this method, the researcher figured out both the random effects and the fixed effects to determine which of these two types is more efficient in explaining the impact of the independent variables on the dependent variables. Further, the **Hausman Test** was employed to determine which of the random effects model or the fixed effects model would be used.

Finally, the researcher applied the **Z-score** formula of Paternoster, Brame, Mazerolle and Piquero (1998) to test the difference among the coefficients of the variables across sectors. Such formula is stated as follows:

$$z = \frac{(\beta_1 - \beta_2)}{\sqrt{(SE\beta_1^2 + SE\beta_2^2)}}$$

where: β_1 = beta coefficient for the first model;
 β_2 = beta coefficient for the second model;
 $SE\beta_1$ = standard error of the beta coefficient for the first model; and
 $SE\beta_2$ = standard error of the beta coefficient for the second model.

The z-score was used to test the assumption on whether the impact of the intangibles on a dependent variable in Model 1 is the same as the impact of the intangibles in the same dependent variable in Model 2. Applying this form, the hypotheses in the study are as following:

Null hypothesis (H_0): Financial_{operating} = Property_{operating}
 Alternative hypothesis (H_1): Financial_{operating} \neq Property_{operating}

4.3 Research Hypotheses. The two major hypotheses that the study intends to answer are as follows:

Ho1 - Intangible assets have no significant impact on total cash flow, cash flow from operating activities, cash flow from investing activities, and cash flow from financing activities when the publicly listed corporations in the Philippines are grouped into (a) all sectors, (b) financial sector, (c) property sector, (d) holding companies sector, (e) services sector, and (f) industrial, mining, and oil sector.

Ho2 – There is no significant difference in the impact of intangible assets on cash flow when the publicly listed corporations are grouped into (a) all sectors, (b) financial sector, (c) property sector, (d) holding companies sector, (e) services sector, and (f) industrial, mining, and oil sector.

5. DISCUSSION OF THE RESULTS

5.1 Descriptive Statistics for the Variables. The intangible assets of the 140 publicly listed corporations amounted to P3.025 trillion for the past four years (2010-2013) or an annual average of P605.051 billion. The said intangible assets consist of goodwill (45.63%) and other intangibles (54.38%). The holding companies shared 46.87% in the aforementioned amount while industrial, mining, and oil companies had 27.68% share. The other sectors had the following shares: services, 19.02%; financial, 4.24%; and property sector, 2.20%.

At the firm level, **intangible assets** had an annual average of P5.402 billion and average maximum value of P101.713 billion (Table 2). The total intangible assets of the firms become dispersed from the mean over the years as shown in the increasing standard deviation – an indication that firms have varied amounts of intangible assets

depending on the magnitude of transactions and the need for such assets. This observation is not surprising as the listed companies come from different sectors. Moreover, the skewness of the total intangible assets appears to decline on a yearly basis from 2010 to 2013. Despite this decline, skewness is still highly positive implicating an inclination to positive values of intangible assets. Again, this indicates the recognition placed by most companies on intangible assets that they invest in and procure this type of asset.

Table 2. Descriptive Statistics of Intangible Assets (In Billion Pesos)

| | 2010 | 2011 | 2012 | 2013 | Mean |
|--------------------------------|--------|--------|--------|---------|---------|
| Total Intangible Assets | | | | | |
| N | 140 | 140 | 140 | 140 | 140 |
| Mean | 3.104 | 4.119 | 6.402 | 7.981 | 5.402 |
| Minimum | 0 | 0 | 0 | 0 | 0 |
| Maximum | 82.150 | 90.744 | 96.152 | 137.808 | 101.713 |
| StdDev | 10.731 | 13.679 | 18.124 | 21.850 | 16.096 |
| Skewness | 5.16 | 4.72 | 3.50 | 3.69 | 4 |
| Goodwill | | | | | |
| N | 140 | 140 | 140 | 140 | 140 |
| Mean | 1.239 | 1.730 | 3.226 | 3.670 | 2.466 |
| Minimum | 0 | 0 | 0 | 0 | 0 |
| Maximum | 30.251 | 70.100 | 62.240 | 91.129 | 63.430 |
| StdDev | 4.185 | 7.183 | 10.597 | 11.544 | 8.377 |
| Skewness | 5.37 | 7.35 | 4.22 | 4.90 | 5 |
| Other Intangible Assets | | | | | |
| N | 140 | 140 | 140 | 140 | 140 |
| Mean | 1.859 | 2.389 | 3.191 | 4.314 | 2.938 |
| Minimum | 0 | 0 | 0 | 0 | 0 |
| Maximum | 69.399 | 77.675 | 82.997 | 95.262 | 81.333 |
| StdDev | 8.642 | 9.921 | 11.468 | 14.428 | 11.115 |
| Skewness | 6.34 | 6.05 | 5.17 | 4.37 | 5 |

The mean value of **total cash flow** from the subject entities amounted to P3.738 billion, with a maximum value of P169.797 billion and a minimum value of negative P38.684 billion (Table 3). The negative value indicates an outflow of cash for some firms on a yearly basis. While the total cash flow had a positive growth rate of 5.86%, cash flow from both operating and investing activities had negative growth rates of .03% and 48.29%, respectively. Thus, the positive growth rate came from the financing activities. In addition, cash flow from both operating and financing activities had positive means of P6.254 billion and P1.426 billion, indicating cash inflows to the firms. Cash flow from investing activities had a negative mean of P4.019, signifying outflows of cash from the firms.

5.2 Panel Regression Results. The results of the fixed effects (FE) and the random effects (RE) models, as well as the Hausman test, are presented in Table 4. The second and third columns identify whether the variable is significant or not in the performed fixed effects and random effects models using t-test values. If the t-test values are

greater than or equal to 1.645 (at 90% confidence interval) or 1.96 (at 95% confidence interval), the variables are considered significant in that model; hence, a “Yes” is written with the corresponding t-value below.

Table 3. Descriptive Statistics of Cash Flows (In Billion Pesos)

| | 2010 | 2011 | 2012 | 2013 | Mean |
|------------------------|-----------|----------|----------|-----------|----------|
| Total Cash Flow | | | | | |
| N | 140 | 140 | 140 | 140 | 140 |
| Mean | 1.868 | 1.408 | 1.476 | 10.198 | 3.738 |
| Minimum | (84.223) | (20.161) | (35.724) | (14.631) | (38.684) |
| Maximum | 86.481 | 161.910 | 150.961 | 279.837 | 169.797 |
| StdDev | 15.458 | 14.255 | 13.785 | 36.425 | 19.981 |
| Skewness | (0.26) | 10.38 | 9.21 | 5.20 | 6.13 |
| Operating | | | | | |
| N | 140 | 140 | 140 | 140 | 140 |
| Mean | 6.971 | 2.438 | 3.442 | 12.164 | 6.254 |
| Minimum | (4.043) | (43.722) | (51.964) | (2.970) | (25.675) |
| Maximum | 203.358 | 79.209 | 80.370 | 290.393 | 163.333 |
| StdDev | 23.647 | 11.059 | 12.195 | 35.289 | 20.548 |
| Skewness | 6.26 | 1.91 | 2.41 | 5.58 | 4.04 |
| Investing | | | | | |
| N | 140 | 140 | 140 | 140 | 140 |
| Mean | (4.284) | (3.371) | (4.735) | (3.686) | (4.019) |
| Minimum | (126.995) | (66.941) | (77.559) | (80.654) | (88.037) |
| Maximum | 33.255 | 41.707 | 20.478 | 187.531 | 70.742 |
| StdDev | 17.044 | 10.936 | 14.546 | 22.160 | 16.172 |
| Skewness | -5.67 | -2.87 | -3.09 | 4.16 | -1.8675 |
| Financing | | | | | |
| N | 140 | 140 | 140 | 140 | 140 |
| Mean | 0.445 | 0.790 | 2.181 | 2.287 | 1.426 |
| Minimum | (55.322) | (40.204) | (48.628) | (102.703) | (61.714) |
| Maximum | 41.644 | 42.335 | 79.156 | 58.341 | 55.369 |
| StdDev | 8.446 | 7.312 | 13.324 | 15.426 | 11.127 |
| Skewness | -0.63 | 1.39 | 2.85 | -1.71 | 0.475 |

To determine which model is appropriate, the ‘Hausman Test p-value’ was used as the basis. If the Hausman test is greater than 0.05 or 5% level of significance, the random effects model was used; otherwise, the fixed effects model was used as indicated in the Preferred Model column. Based on the results of the preferred model (either random effects or fixed effects), the coefficients were indicated on the dependent variables where intangible assets have a significant impact. As the research aims to know only the significant relationships, the caption not applicable (NA) was indicated for those where the relationship was insignificant. In fact, knowing the coefficient of a variable with insignificant impact bears no value whatsoever in the analysis of the results. Understandably, the sample size in each sector is multiplied by four years, the period covered in the study.

The results of the models under **all sectors** show that intangible assets have a **significant impact** on all dependent variables: total cash flow (0.910737) and cash flow from operating (0.295606), investing (0.68133), and financing (0.0607693) activities. With the exception of cash flow from investing activities and the total cash flow, the preferred model for the rest of the dependent variables is the random effects model. As shown, the intangible assets have the most significant impact on **total cash flow**, followed by cash flow from investing activities and cash flow from operating activities. On the other hand, intangible assets have the least effect on cash flow from financing activities.

Table 4. Regression Results For All Sectors (N=560)

| Dependent Variable | Significant in? | | Hausman Test p-value | Preferred Model | Coefficient of Intangible |
|--------------------------------------------|--------------------------|---------------------------|----------------------|-----------------|---------------------------|
| | Fixed Effects (FE) Model | Random Effects (RE) Model | | | |
| All Sectors (N=560) | | | | | |
| Operating | No (1.4458) | Yes (4.5660) | 0.155007 | RE | 0.295606 |
| Financing | No (0.7094) | Yes (1.7373) | 0.524566 | RE | 0.0607693 |
| Investing | Yes (10.3559) | No (1.3295) | 2.68E-36 | FE | 0.68133 |
| Total Cash | Yes (9.8616) | Yes (6.0587) | 2.91E-14 | FE | 0.910737 |
| Net Profit | Yes (9.5302) | Yes (11.7139) | 0.096159 | RE | 0.2070626 |
| Financial Sector (N=100) | | | | | |
| Operating | No (1.6181) | Yes (2.6280) | 0.817394 | RE | 4.31824 |
| Financing | No (-0.2914) | No (-1.3519) | 0.56574 | RE | NA |
| Investing | Yes (4.1563) | Yes (2.5805) | 0.00125846 | FE | 3.99274 |
| Total Cash | No (1.2328) | Yes (1.8083) | 0.691948 | RE | 3.14616 |
| Net Profit | No (0.8893) | Yes (1.9761) | 0.00249604 | FE | NA |
| Property Sector (N=64) | | | | | |
| Operating | No (1.0946) | No (1.0057) | 0.639999 | RE | NA |
| Financing | No (-1.1615) | No (-0.5530) | 0.250377 | RE | NA |
| Investing | No (0.7585) | No (0.2876) | 0.379587 | RE | NA |
| Total Cash | No (-0.0745) | No (-0.8731) | 0.680664 | RE | NA |
| Net Profit | Yes (-6.2477) | Yes (-4.8896) | 0.00037984 | FE | -0.969206 |
| Holding Sector (N=76) | | | | | |
| Operating | Yes (2.9469) | Yes (3.5235) | 0.948752 | RE | 0.166438 |
| Financing | No (-0.6508) | No (1.2412) | 0.0630001 | RE | NA |
| Investing | Yes (7.7441) | Yes (3.9248) | 1.07E-10 | FE | 1.08526 |
| Total Cash | Yes (9.5389) | Yes (4.3229) | 6.55E-15 | FE | 1.26426 |
| Net Profit | Yes (6.3583) | Yes (6.0392) | 0.0530796 | RE | 0.28522 |
| Services Sector (N=124) | | | | | |
| Operating | No (1.6219) | Yes (2.1528) | 3.46E-12 | FE | NA |
| Financing | Yes (2.2952) | No (-0.0559) | 2.65E-08 | FE | 0.101971 |
| Investing | Yes (-4.9296) | Yes (-7.7944) | 0.000108707 | FE | -0.228667 |
| Total Cash | Yes (-2.0674) | Yes (-1.9496) | 0.161088 | RE | -0.0354883 |
| Net Profit | Yes (-6.8211) | Yes (-3.4492) | 2.77E-18 | FE | -0.120824 |
| Industrial, Mining, and Oil Sector (N=196) | | | | | |
| Operating | No (0.7546) | Yes (2.3736) | 0.176912 | RE | 0.244633 |
| Financing | Yes (3.9308) | Yes (4.7296) | 0.56162 | RE | 0.252404 |
| Investing | No (1.1988) | Yes (-2.2596) | 1.39E-07 | FE | NA |
| Total Cash | Yes (5.3649) | No (-0.3435) | 2.47E-10 | FE | 0.610555 |
| Net Profit | Yes (2.0405) | Yes (4.1674) | 4.26E-06 | FE | 0.0595922 |

Intangible assets impose a significant impact on **cash flow from investing activities** because most of the transactions in this cash flow type involve purchasing or selling franchises and licenses, and business acquisitions and mergers (reflected in goodwill). Similarly, intangible assets have a significant effect on **cash flow from operating activities** as reflected by continuous amortization or gains from long-term intangible assets. Another reason behind the significant effect of intangibles on operating cash flow is the fact that intangible assets are also constituted by computer software which is considered as a vital part of the daily operations especially of financial and information technology-related corporations. Because most companies with intangible assets are in industries where high capital expenditure and investments on branches, franchises and licenses are required, they have a relatively large magnitude of investing activities.

Intangible assets of those in the **financial sector** are significant in explaining total cash flows (3.14616), cash flows from operating activities (4.31824), and cash flows from investing activities (3.99274), but not cash flows from financing activities.

Intangible assets of those in the **property sector** have no significant impact on all the dependent variables. The fact that corporations in this sector invest heavily in tangible assets like plant, property, and equipment rationalizes this lack of association in the variables. Moreover, across the publicly listed corporations in the property sector, business acquisitions are not prevalent, since only 44% have goodwill as a result of acquisitions.

For the publicly listed **holdings firms**, intangible assets have a significant impact on all the dependent variables, except for the cash flow from financing activities. Again, this can be explained by the fact that financing activities have a relatively slight association with intangible assets. While the coefficients of the models for investing activities (1.08526) and total cash flows (1.26426) are relatively higher, the same are still lower than those of the financial sector, indicating that intangible assets have a higher impact on corporations in the financial sector than in holdings companies.

Intangible assets in the **services sector** have a significant impact on total cash flows (-0.0354883) as well as cash flows from investing (-0.228667) and financing (0.101971) activities but not on cash flows from operating activities. A review of the data shows that the services sector includes subsectors like casinos and gaming, education, hotel and leisure, information technology, media, retail, telecommunication, transportation services, and other similar services. These entities follow fast-paced operations and require investments mostly in current assets. Hence, intangibles may not have a direct impact on operating cash flows. The negative coefficients confirm the inference that intangibles do not constitute much of the operations of service firms, hence, they represent an expense or cash outflow to the companies. On the other hand, intangibles like goodwill resulting from business acquisitions may attract investors and increase shareholdings, hence a positive coefficient for cash flows from financing activities.

In the **industrial, mining, and oil sector**, intangible assets have a significant impact on total cash flows (0.610555) as well as cash flows from operating activities (0.244633) and financing activities (0.252404) but not on investing activities. This appears

contrary to the expectation that intangible assets, especially those related to business acquisitions, are significant to cash flow on investing activities because intangible assets are long-term assets. It is again necessary to understand the nature of the industry to explain this seeming contradiction. Industrial, mining, and oil companies are capital-intensive firms, that is, they require extensive investments in plant, property, and equipment (including land) more than investments they need on other assets such as intangibles. Nevertheless, intangible assets still provide a positive impact on cash flows from operating and financing activities, thereby resulting in positive impact on the total cash flow.

In summary, the study has come up with the following responses to the research hypotheses as shown in Table 5. The first hypothesis is rejected for all sectors but accepted for the property sector. Essentially, intangible assets have a significant impact on total cash flow as well as cash flows from operating, investing, and financing activities in **all sectors** of publicly listed corporations in the Philippines. However, intangible assets have no significant impact on all types of cash flows in the **property sector**.

Table 5. Summary of Impact of Intangible Assets on Cash Flows

| Sector | Operating | Investing | Financing | Total Cash Flow |
|-----------------------------|-----------|-----------|-----------|-----------------|
| All Sectors | S | S | S | S |
| Financial | S | S | NS | S |
| Property | NS | NS | NS | NS |
| Holding companies | S | S | NS | S |
| Services | NS | S- | S | S- |
| Industrial, mining, and oil | S | NS | S | S |

S-Significant; NS-Not Significant

In the **financial sector**, intangible assets have a significant impact on total cash flow, cash flow from operating activities, and cash flow from investing activities. Thus, the null hypothesis was rejected. However, no significant impact was established on cash flow from financing activities in the said sector. In the **holding companies**, intangible assets have a significant impact on total cash flow, cash flow from operating activities, and cash flow from investing activities. As a result, the null hypothesis was rejected. Nonetheless, no significant impact was found out for the cash flow from financing activities. In the **services sector**, intangible assets have a significant impact on total cash flow, cash flow from investing activities, and cash flow from financing activities, thereby, rejecting the null hypothesis. But there was no significant impact established on the cash flow from operating activities. Finally, intangible assets have a significant impact on total cash flow, cash flow from operating activities, and cash flow from financing activities in the **industrial, mining, and oil sector**. The null hypothesis was also rejected. However, intangible assets have no significant impact on the cash flow from investing activities in the said sector.

5.3 Test of Differences of the Effects Based on Sectoral Groups. The z-scores obtained for testing are indicated below the Yes/No notation in Table 6. As shown in

the table, the impact of intangible assets of the **financial sector** is significantly different in the operating activities of the holding companies (2.5256593) and industrial, mining, and oil sector (2.47425252). Similarly, the impact is significantly different in the investing activities of the holdings companies (2.9915736) and services sector (4.3868172).

Table 6. Summary of the Test of Differences Across Sectors

| | Is Beta Coefficient Significantly Different Than? | | |
|--------------------------|---------------------------------------------------|-------------------|------------------------------------|
| | Holding Companies | Services Sector | Industrial, Mining, and Oil Sector |
| Financial Sector | | | |
| Operating | Yes 2.5256593 | | Yes 2.47425252 |
| Investing | Yes 2.9915736 | Yes 4.3868172 | |
| Total Cash | No 1.0785325 | No 1.82861209 | No 1.45427877 |
| Holding Companies | | | |
| Operating | | | No -0.68971448 |
| Investing | | Yes 9.12834631 | |
| Total Cash | | Yes 9.71540806 | Yes 3.74200607 |
| Services Sector | | | |
| Financing | | | Yes -2.16638693 |
| Total Cash | | | Yes -5.60550558 |

The impact of intangible assets of the **holding companies** is significantly different from those in the services sector in investing activities (9.12834631) and total cash flow (9.71540806). Also, the impact is significantly different in the total cash flow (3.74200607) of those in the industrial, mining, and oil sector.

Lastly, the impact of intangible assets of companies in the services sector is significantly different from those in the industrial, mining, and oil sector with respect to total cash flow (5.60550558) and cash flow from financing activities (2.16638693).

6. CONCLUSIONS AND RECOMMENDATIONS

This study provides a reasonable basis to infer that intangible assets have a **significant impact** on cash flows. The impact was determined to be 91.07% on total cash flow, 29.56% on cash flow from operation, 68.13% on cash flow from investing activities, and 6.07% on cash flow from financing activities. The overall impact is deemed to be valuable or meaningful given the fact that most publicly listed companies invest and

procure assets in thousands and millions of pesos. In the end, the impact can still be magnified.

The study also substantiates that the impact of intangible assets on cash flow varies across sectors, with a few exceptions. This makes it difficult for companies to hold a general assumption in the case of publicly listed companies in the Philippines. Thus, the management of these corporations has to consider the nature or sector where the company belongs to come up with sound business decisions pertaining to intangible assets. As shown in the regression results, intangibles do not always yield positive returns on specific cash flows for certain industries. These findings are also validated by the z-score test of difference in the effects of the beta coefficients of the variables per sector. In essence, the effects of intangible assets on a firm's liquidity vary significantly across sectors.

The findings suggest that sector-specific studies be conducted to determine more deeply the effects of intangible assets on cash flows as it is already evident that the effects of intangibles vary across such sectors. Future studies can include companies other than publicly listed corporations to enlarge the sample size. In addition, the impact of intangible assets can be examined along other measures of economic benefits such as revenue growth, profitability, share prices, and competitiveness. Future studies may also opt to add variables or dummies that may account for time effects and the nature of the sectors so as to enhance the reliability of the model.

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