

Understanding the Complexity of Intangible Assets

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Abstract:

The growing importance of strategic innovation in connection to the development of leading companies heavily investing in intangible assets makes intangible asset valuation a delicate issue for academics, practitioners, and policy makers. Yet, there is still no common and standardized method to value intangible assets. This paper presents the main developments in intangible assets valuation and provides empirical evidence on the influence of intangible assets on investor decisions and firm valuation. In particular, this paper analyses the relationship between intangible assets, market capitalization, sales and price-earnings ratio. It uses an OLS and Fixed Effects approach and finds evidence that an increase in intangible assets increases market capitalization and sales, but has no significant impact on price-per-earnings ratio. The results suggest that intangible assets valuation might affect firm's valuation and, therefore, there is a need of a framework to assign a value for the intangible assets.

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I. INTRODUCTION

Companies invest in Machinery, a tangible asset that can be physically touched and valued through the classical accounting rules (Cohen, 2001). At the same time, they also invest in license contracts, an intangible asset that can't be physically touched but still has a value which is much more difficult to find and establish (Joia, 2000). Tangible assets' values are assigned based on the future benefits these assets yields (Laughton, Guerrero, & Lessard, 2008). Intangible assets instead are not that easy to value because of the volatility assigned to their future relevance (Choi, Kwon, & Lobo, 2000). This is because the nature of this asset is different. It is key to understand that the main difference between an intangible asset and a tangible asset is the virtual perception assigned to it (Allee, 2008). For instance,

two investors would assign different values to the same intangible asset because there exists a virtual benefit delivered that is perceived differently (Axtle-Ortiz, 2013). Therefore, the subjective nature of intangible assets makes the valuation process more difficult and harder to standardize (Penman, 2009). An illustrative example of the differences in intangible asset valuation is the case of McDonalds. It is more expensive to acquire the license of McDonalds in Kuwait compared to France (Hall, Jaffe, & Trajtenberg, 2005). The parent company is the same, the service provided is the same but there exists an extra benefit to the final users that pushes this brand to be valued differently. (Churchill, 1978) describes this idea stating that the critical element in the evaluation the lack of better measures of the variables assigned to intangible assets. Although

such assets receive a value, the way this value is determined is not yet standardized due to several reasons. The purpose of the paper is to provide an evidence of the need of a framework to assign a value for the intangible assets. Previous literature provides empirical evidence on how tangible book value is diverging from the market value (Egginton, 1990). This paper shows that there exists a positive relationship between intangible assets and market capitalization, giving some insights that intangible assets might have been a factor in causing the gap between tangible book value and market value (Barth & Clinch, 1998).

The paper is organized as follows. Section 2 exposes the main issues that intangible assets valuation face throughout literature review. Section 3 describes the panel of US firms analysed in this work and presents an econometric analysis and finds evidence that intangible assets affects firm value. Section 4 concludes.

II. LITERATURE REVIEW

Intangible assets have been under the spotlight because of their growing importance within the business world (Kaplan & Norton, 2004). In fact, innovation, which seems to be the key word in today's business, cannot be separated from the concept of intangible assets because they represent the intellectual capital of a firm as well as its potential growth through innovation (Jarboe & Ellis, 2010). Even if this topic is catching significantly the attention of several experts, there is still an ongoing debate referring to its features starting from its definition (Wyatt, 2005). For example, (Anson, 2007) refers to intangible assets as those assets including patents, trademarks, copyrights, brand names, logos, and other elements that constitute the firm's goodwill. (Smith & Parr, 1994) define intangible assets as those elements of a business enterprise that exist in addition to working capital and tangible assets. Therefore, intangible assets according to Smith and Parr are those elements

along with working capital and tangible assets that allow businesses to operate and can be the primary contributors to a firm's success factors and competitive advantage. This view is supported by the growing importance of innovative firms in the global market, not only from a global perspective, but also from a financial perspective (Cañibano, Garcia-Ayuso, & Sanchez, 2000). Simply looking at giants, such as Apple, Microsoft and Google among others, explains how important intangible assets are for a company's profitability, future growth and sustainability. However, due to the very recent discovery of intangible assets from an accounting perspective (Austin, 2007), and their nature, they are still very difficult to deal with. In particular, their treatment is a major concern for firms as well as the academic and policy world (Brennan & Connell, 2000). In some cases, intangible assets are considered as an expense while in other situations they can be capitalized. Thus, it is still not yet clear how they should be treated. (Bodie, Kane, & Marcus, 2003) try to address this issue by summarizing some of the most important accounting rules related to valuation and how they apply to intangible assets according to the U.S. GAAP. Other outstanding scholars such as (Lev, 2003) mention the inability of these methods to convey the actual value of intangible assets.

Following data from The Conference Board (Erumban & De Vries, 2016), investment in intangible assets, measured as % of GDP, has been steadily growing since the Second World War and it has even surpassed investment on tangible assets on recent years. However, these investments remain largely invisible in financial statements (they are reported in the income statements) and firms carry some intangible assets in their balance sheet (Barth & Beaver, 1996), but not all of them (Adams & Oleksak, 2010). At the same time, as we can observe in Figure 1, the book value of tangible assets and market value of firms have been diverging (Hirschey, 1985), especially since 1985, with intangible assets being a key factor in explaining the

gap. The methodology followed by Ocean Tomo LLC (Barney, McHardy, Hartstein, & Ramer, 2007) is to decompose the market value of a firm in tangible and intangible assets. The procedure is as follows: First, they calculate the tangible book value; then, if market capitalization is above the tangible book value, they assign this difference to intangible assets and call it Intangible Asset Market Value (Elsten& Hill, 2017). It is as if the market agents

were valuing the intangible assets by themselves, but this approach remains quite problematic (Ballester, Garcia-Ayuso, Livnat, 2003). Both the increasing investment in intangible assets and the divergence between tangible assets and market capitalization gives a good view of the growing importance of intangible assets and highlights the need for a standardized method to value them (Hagelin, 2002).

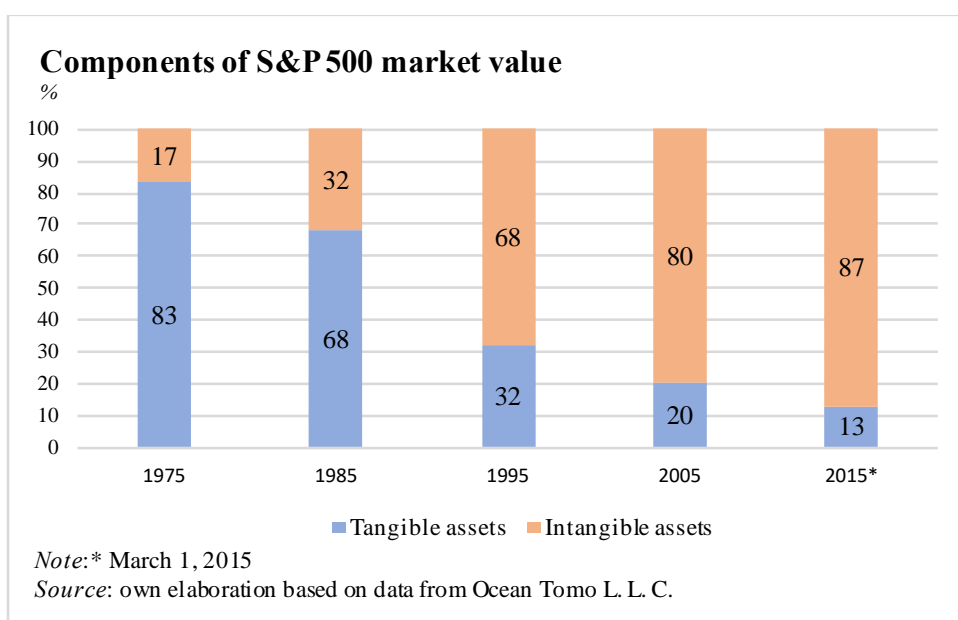


Figure 1: Components of S&P500 market value
However, it is always difficult to derive what is the part of the cash flow attributable to intangible assets. Even when applying the most known valuation techniques in the private industry, there is still no exact technical way to evaluate intangibles (Leitner, 2005). In a way, fair value accounting provided some extra tools to deal with this issue, but still most of the intangible assets do not have market value (Chalmers, Clinch, & Godfrey, 2008), hence the same challenge keeps playing its role. There is a notable exception to this in the case of companies acquiring other firms: according to the US legislation, the purchaser has to record on its balance sheet the full value of the acquired company (Rodov&Leliaert, 2002). In this way, even if the firm that is bought did not record any intangible assets, these will then show up in the new

consolidated accounts, albeit not with a detailed breakdown and not fully differentiated from goodwill (Johnson & Petron, 1998).

Another major concern surrounding the intangible capital or intangible assets literature is the complexity of splitting them from their physical side (Bontis, Bart, Wakefield, & Kristandl, 2007). There are several studies addressing this issue. For example, (Basu&Waymire, 2008) do not believe that tangible and intangible assets can be split. One reason for their argument is that a firm gets value out of an intangible only if this asset is produced and commercialized. Moreover, another stream of thought represented, for instance, (Marr, 2007) considers that some kind of intangible assets are too complex to evaluate simply because they can be seen

as public goods belonging to the society, such as education and human skills in general.

Another of the key aspects in reference to the valuation of intangible assets is the impact they have on the macroeconomy. (Corrado, Hulten, & Sichel, 2005) discuss the impact of R&D expenses not only for the firm implementing them but also for the macroeconomic system as a whole. In summary, their point of view is that the treatment of R&D investments might affect differently the economy depending on how they are valued. If they are simply treated as expenses, then their contribution to the economic growth in terms of GDP is underestimated; however, if they are capitalized, their impact on the economy is taken into account. In addition, they believe that it is possible to see their value not only from a firm point of view, but also from a macroeconomic perspective.

After briefly seeing and understanding how the valuation of intangible assets can be relevant from different perspectives, let us take a step back to understand more thoroughly what intangible assets actually are and how can we classify them. (Walker, 2009) states that it is difficult to find any stated purpose for classification in many papers dealing with intangible assets. At the same time, for internal purposes management needs to evaluate its assets including intangibles and, to do so, they require a formal classification of them. (Lev, 2004) classifies intangible assets and intellectual capital in four main categories:

1. Discovery/learning; ex: R&D
 2. Customer-related; ex: brands, trademarks, distribution channels
 3. Human-resource; ex: education, training and compensation systems
 4. Organization capital; structural organization design, business processes, unique corporate culture.
- Other authors prefer to divide intangible assets into different categories. For instance, (Kaufmann & Schneider, 2004) divide intangible assets into three

categories based on the object these assets are related to: Human Capital when related to employees; Organizational Capital when related to internal structure and processes; Customer Capital when related to customers.

By simply looking at the two different classifications above, it is relatively easy to understand the complexity of the issue that arises when dealing with intangible assets, their nature and contribution. Luckily, if one is interested in the pure regulatory classification of them, it is possible to rely on the Financial Accounting Standards Board (FASB), (Powell, 2003) which classified these categories of assets as follows:

- Technology-based Assets
- Customer-based Assets
- Market-based Assets
- Workforce-based Assets
- Contract-based Assets
- Organization-based Assets
- Statutory-based Assets

Even if there is a formal classification of intellectual capital, this classification does not always hold true when dealing with managerial decisions (Trigeorgis, 2005) simply because the valuation and employment of assets depend heavily on their nature and purpose. The problem arises because the purpose of the asset might be assessed or reassessed after its acquisition depending on the performance (St-Pierre & Audet, 2011). This is a perfect introduction for another major problem companies and their managers face when dealing with intellectual capital and the way it can be regulated, as market participants can face increased trouble if definitions and standards are not harmonised and well-understood (Zambon, Lev, Abernethy, Wyatt, Bianchi, Labory, & Del Bello, 2003). The complexity of the issue for standards setters is demonstrated through the investigation conducted by (Stolowy & Jeny-Cazavan, 2001) that showed a considerable lack of consistency among 21 national and 2 international standard setters. The study of intangible assets' definition and recognition criteria

in 23 national and international standards demonstrated the absence of any common framework of classification. According to them, this inconsistency is the result of each country treating the same intangible asset in several different ways depending on the business situation. Consequently, intellectual capital might have a significant influence on policy decisions (Brüggen, Vergauwen, & Dao, 2009). In fact, whether intangible assets should be capitalized or not, their importance relative to investor's decisions, and all other issues discussed above, clearly pose more than one question to policymakers. For this reason, policymakers should make sure that investors perceive the best information both in terms of quality and in terms of quantity so that they can make the best investment decisions. At the same time, we discussed how relevant and delicate this information could be for internal managerial decisions (Sacui & Szatmary, 2015). Some studies try to help policy decisions identifying how information about intangible assets might affect stocks' returns. For instance, Wyatt (2008) addresses the issue of how some of the most relevant intangible assets of a firm affect financial performance. He investigates items such as R&D, human capital and organizational capital. Furthermore, his analysis assumes that investors use accounting information in order to make investment decisions, and this cannot be totally proved for all cases. As many other assumptions, the latter is very difficult to prove even if it logically makes sense. (Basu & Waymire, 2008) express another very interesting point of view related to the relevance of intangible capital information from a financial perspective. In particular, they state that abnormal returns can be explained by other relevant factors such as changes in regulations or other kind of government interventions (Jansen, & Tsai, 2010). Therefore, a simple correlation between investment in intangible assets and returns cannot be used as a strong proxy for their value relevance, as it might be biased by different policies.

The last section of this section is related with the financial and accounting approach towards intangibles. However, as discussed at the beginning of this paper, the importance of intellectual capital is spread over all divisions of a business. For example, marketing and branding (Bayon, Gutsche, & Bauer, 2002). are very much interrelated when we think of branding as an intangible asset. From a strategic perspective, to value the competitive advantage of a firm, especially when dealing with high tech innovation focused firms, the strategic valuation of intangibles becomes a key point (Clemons & Weber, 1990). Even from an economic/industrial organization perspective, when talking about competition and economies of scale, intangible assets might play a key role (Teece, 1998). In consequence, many researchers have been focusing on this topic to reveal a stronger relation between value drivers, concept and henceforth value. (Montaña & Nomen, 2007) ran many studies focusing on the value of companies' intellectual capital. From a financial perspective, the valuation of intangible assets is complex as well due to the various ways they can be classified (Corcoles, 2010). (Roos & Roos, 1997) studied the systematic visualization and measurement of the different forms of intellectual capital and described it as the difference between a company's market value and its book value. From one side, the book value of an intangible asset is a valuation approach done internally reflected in the accounting books of a company and from another side, the market value is based on so many factors and participants summarized as supply and demand. They assume that they should base the valuation on certain cash flows that this asset can provide in the future. The estimation of the future cash flows depends on factors such as the kind of asset, its usage or its lifetime, among others. This means that these cash flows can vary between one investor (Khurana, Martin, & Pereira, 2006) and another since the factors affecting their estimation are not standardized (Richardson, 2006). This is the main weakness of this model. Thus, on one hand, a

standard critique of this particular valuation model is that it fails to account for the factors affecting those cash flows that are subsequently discounted to the present, and on the other hand, they are highly descriptive and inconsistent.

Academics realized there was a recognition of the need of further studies on the asset valuation models (Matsuura, 2004) to apply on the intangible assets due to the improper classification addressed above that in turns led to an unfair value. Consequently, (Damodaran, 2007) examined the four asset valuation models focusing on one or several factors to add on to the previous researchers' findings with the intention of addressing various approaches. The four approaches are:

1. Discounted cash flow valuation, *based on future cash flows*
2. Liquidation and accounting valuation, *based on book value of existing assets*
3. Relative Valuation, based on pricing of asset comparisons such as earnings, cash flows, book value or sales
4. Contingent claim valuation, *based on real option*

As previously stated regarding the first two approaches addressed before, the third one, with a "relative valuation", is based on a comparative methodology. A major factor addressed by Damodaran is that prices have to be standardized, usually by converting them into multiples of earnings, book values or sales. However, a major element neglected in his research is to keep in mind the need of finding similar firms, which is difficult to do since no two firms are identical and firms in the same business can still differ on factors such as risk profile, growth potential, cash flows and strategies, resulting in an inconsistent estimation of this asset value.

From another perspective, the future cash flow approach reflects the market reaction. Thus, basing the intangible asset valuation on this method could

result in values that are too high when the market is overvaluing comparable firms, or too low when it is undervaluing them. Both results can be justified depending on investors' perspectives, which is considered a source for a bias in this method. In other words, the question that arises here of how to control for these differences having several firms in the industry, becomes a key one in this model.

While there is scope for bias in any type of valuation model addressed by all the studies above, the lack of transparency and consistency regarding the underlying assumptions in these valuations for intangible assets makes them particularly vulnerable to manipulation and thus might lead to an unfair value (Barth & Schipper, 2008).

In order to perform an appropriate investigation within the field of intangible assets, there is the need to understand what the purpose of such research is. For instance, if the interest lies in tackling the valuation literature and extending it to the intangible assets dimension, then the first step to go through would be to understand if the above-mentioned evaluation model as well as other selected ones could be applied to the so-called strategic assets. If this is not the case, then it is necessary to develop brand new valuation approaches to tackle the problem. The valuation literature spans from Finance, Economics and Accounting, so testing each one of the most recent existing valuation models to the intangible assets dimension would be challenging and time consuming (Wang & Halal, 2010). Perhaps the solution is to simply agree on some assumptions and try developing new approaches using the existing literature as a baseline. However, this task becomes even more challenging because as aforementioned there is not yet a common market valuation of intangible assets in particular because they tend to yield benefits in the long run and this future benefit is very difficult to forecast due to its outcomes' volatility (Jiang, 2019). Another big stream of research could be trying to identify the "macro" benefits that investments in

intangible assets could yield. In fact, this would be another challenging task, which would involve understanding and testing many economic theories of welfare, industrial organization and innovation. Moreover, there would be room to introduce behavioural factors and experimental approaches. This would open a new door for collaboration between economics, anthropology, sociology and psychology. Even strategy could be considered part of this research because each one of the above-mentioned disciplines deals in some way with social welfare and utility maximization. Hence, such a stream of research would bring together many questions. At the same time, such line of research faces its challenges starting from the costs of implementation. It would be an extremely ambitious plan, which would require heavy research investments. Hence, the most plausible approach would be to try finding first some coordination among the academic disciplines, which could give some guidelines to the new possible research streams. Maybe even starting from an analysis of the current regulation to then get to suggestions on how to improve the latter.

After presenting several issues arising from not having standardized methods of valuation for intangible assets, in the next sections, this paper highlights the relevance of intangible assets from the investor's perspective through an econometric analysis.

III. ECONOMETRIC ANALYSIS

Data description

The data is obtained at the firm-level from a Bloomberg dataset. It includes a representative sample of leading firm's population in United States (which are included in S&P 500 Index) from 2013 to 2017 (both years included). Before cleaning it, the sample contains 506 firms per year. To conduct the analysis, I proceed as follows to clean the data: First, I drop all firms with missing data in any year (from 2013 to 2017) for any variable (intangible assets, sales or market capitalization). This step reduces the

sample to 432. Second, I validate internal consistency so that no zero and no negative values remain in the sample (the sample stays the same in this step).

Correlation and regressions

As stated before, tech giants as Apple, Microsoft and Google among others highlights how important intangible assets are in order to differentiate their products, their brand and their future growth. I test the hypothesis that more intangible assets have a positive effect on market capitalization and on sales. To illustrate this point, I run a correlation analysis:

Table 1. Correlation analysis

Intangible					
assets against	2013	2014	2015	2016	2017
Market					
Capitalization	0.60	0.59	0.50	0.50	0.45
Sales	0.44	0.43	0.40	0.40	0.40

The table reports correlation between intangible assets against market capitalization and sales for years from 2013 to 2017.

Source: Based on data from Bloomberg that includes 432 firms from S&P 500.

The results in Table 1 show a positive correlation between intangible assets and sales as well as a positive correlation between intangible asset and market capitalization. As a matter of illustration, in Figure 2 and 3, I plot an OLS regression for 2013. Although we find evidence that show a positive correlation between intangible assets and market capitalization, and sales, we cannot conclude that having greater intangible assets causes higher market capitalization and sales because there might be the typical issues when an OLS is involved (as omitted variable bias and simultaneous causality). For example, it might be that some variables that are not included in our regression is actually affecting both intangible assets (explanatory variable) and market capitalization or sales (dependent variable).

Figure 2. OLS 2013: market capitalization on intangibles

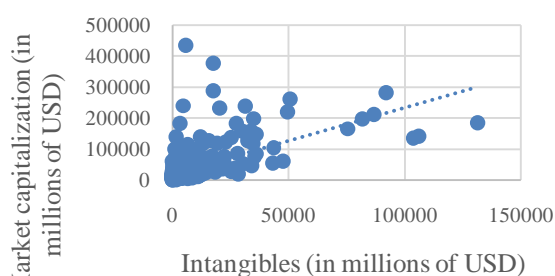
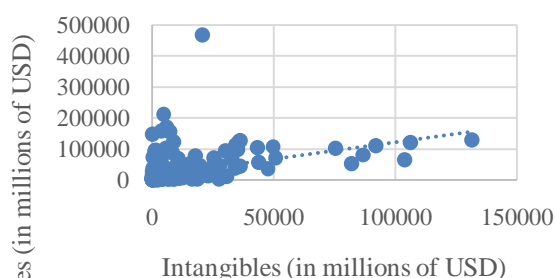


Figure 3. OLS 2013: sales on intangibles



Therefore, firms with higher intangible assets have, on average, a higher market capitalization and a higher amount of sales. However, the direction of the effect is not clear and we can not talk about causality due to the potential omitted variable bias, and especially, potential simultaneous causality.

However, due to the fact that data is structured in a panel, it is better to exploit this extra information through panel data models. First, I run a pooled OLS. The results, obviously, can not be interpreted as causal due to the same problems of endogeneity that I have mentioned above. Furthermore, there

might be unobserved fixed effects correlated with the explanatory variable and, therefore, the estimates would be both biased and inconsistent. In order to solve this problem, I apply a fixed effects model.

Table 2. Panel data estimates for market capitalization and sales

	Market capitalization		Sales	
	(1) OLS	(2) Fixed Effects	(3) OLS	(4) Fixed Effects
Intangibles	1.895*** (0.043)	0.847*** (0.043)	0.98*** (0.030)	0.267*** (0.019)
Constant	15514 (645.40)		1134 (447.29)	
R-squared	0.28	0.09	0.17	0.04
Time FE	NO	YES	No	YES

(***), (**),(*) indicate statistical inference at 0.01, 0.05 and 0.1 level, respectively.

For the specification in which fixed effects are included, (2) and (4), an increase of 1 million of intangible assets would lead, in average, to an increase of 0.847 million in market capitalization and of 0.267 million in sales, respectively (see Table 2).

Furthermore, it would also be interesting to assess the question whether firms with higher intangible assets are overvalued (in terms of having a higher price-earning ratio). I find no empirical evidence of firms with higher intangible assets to have a higher price-earning ratio (see Table 3).

Table 3. Panel data estimates for price-earning ratio

	Price-earning ratio	
	(1) OLS	(2) Fixed Effects
Intangibles	0 0	0 0
Constant	42.9 (3.29)	
R-squared	0	0
Time FE	NO	YES

(***), (**),(*) indicate statistical inference at 0.01, 0.05 and 0.1 level, respectively.

IV. CONCLUSION

In conclusion, although the current literature tends to address the financial valuation of intangible assets, even when dealing with policy implication, there should be more effort in trying to coordinate the various business disciplines to give at least a common characterization to these items. Therefore, intangible assets are definitely becoming important for the business environment within many dimensions, but before trying to define their political or financial impact, it would be interesting to figure out a common ground to test their importance and then proceed with a technical financial analysis. This would be a key point for the development of the field simply because, as previously analyzed, there is still no agreement on how to interpret and classify such important strategic items. The natural progression would be to addressing the importance of these assets using current findings in the various streams of research to understand where these disciplines do actually stand when dealing with strategic assets. Then, it would be interesting to merge the goals of scholars among different areas to finally reach a common ground to develop and exploit the intangible assets developments and applications. Based on this last statement, this paper is a contribution to the literature dealing with intangible assets as a report underlying the main challenges and possibilities behind this new stream of research to understand the nature of intangible assets. Particularly, this paper emphasizes the need for a common and standardized way to value intangible assets so that all economic agents may take choices based on as accurate as possible firm information. Finally, this paper finds evidence through a Fixed Effects model that, in the U. S., intangible assets value has a positive impact on both market capitalization and sales, what highlights the need for a common framework of intangible asset valuation. Therefore, intangible assets valuation might affect firm's valuation and future research will be needed to find a common framework in which investors might operate in financial markets with better information and fundamentals.

V. BIBLIOGRAPHY

1. Adams, M., & Oleksak, M. (2010). *Intangible Capital: Putting Knowledge to Work in the 21st-Century Organization: Putting Knowledge to Work in the 21st-Century Organization*. ABC-CLIO.
2. Allee, V. (2008). Value network analysis and value conversion of tangible and intangible assets. *Journal of intellectual capital*.
3. Anson, W., & Drews, D. C. (2007). The intangible assets handbook: maximizing value from intangible assets. American Bar Association.
4. Austin, L. (2007). Accounting for intangible assets. *University of Auckland Business Review*, 9(1), 63-72.
5. Axtle-Ortiz, M. A. (2013). Perceiving the value of intangible assets in context. *Journal of Business Research*, 66(3), 417-424
6. Barney, J., McHardy, L., Hartstein, P., & Ramer, A. (2007). *U.S. Patent Application No. 11/517,070*.
7. Ballester, M., Garcia-Ayuso, M., & Livnat, J. (2003). The economic value of the R&D intangible asset. *European Accounting Review*, 12(4), 605-633.
8. Barth, M. E., & Schipper, K. (2008). Financial reporting transparency. *Journal of Accounting, Auditing & Finance*, 23(2), 173-190.
9. Barth, M. E., & Clinch, G. (1998). Revalued financial, tangible, and intangible assets: Associations with share prices and non-market-based value estimates. *Journal of accounting research*, 36, 199-233.
10. Basu, S., & Waymire, G. (2008). Has the importance of intangibles really grown? And if so, why?. *Accounting and business research*, 38(3), 171-190.
11. Barth, M. E., Beaver, W. H., & Landsman, W. R. (1996). Valuation characteristics of equity book value and net income: Tests of the abandonment option hypothesis. Available at SSRN 2762.
12. Bayon, T., Gutsche, J., & Bauer, H. (2002). Customer Equity Marketing:: Touching the Intangible. *European Management Journal*, 20(3), 213-222.

13. Brennan, N., & Connell, B. (2000). Intellectual capital: current issues and policy implications. *Journal of Intellectual capital*.
14. Bontis, N., Bart, C., Wakefield, P., & Kristandl, G. (2007). Constructing a definition for intangibles using the resource based view of the firm. *Management decision*.
15. Bodie, Z., Kane, A., & Marcus, A. J. (2003). Essential of investments. International Edition.
16. Brüggem, A., Vergauwen, P., & Dao, M. (2009). Determinants of intellectual capital disclosure: evidence from Australia. *Management decision*.
17. Cañibano, L., Garcia-Ayuso, M., & Sanchez, P. (2000). Accounting for intangibles: a literature review. *Journal of Accounting literature*, 19, 102-130.
18. Chalmers, K., Clinch, G., & Godfrey, J. M. (2008). Adoption of international financial reporting standards: impact on the value relevance of intangible assets. *Australian Accounting Review*, 18(3), 237-247.
19. Churchill Jr, G. A. (1979). A paradigm for developing better measures of marketing constructs. *Journal of marketing research*, 16(1), 64-73.
20. Choi, W. W., Kwon, S. S., & Lobo, G. J. (2000). Market valuation of intangible assets. *Journal of Business Research*, 49(1), 35-45
21. Clemons, E. K., & Weber, B. W. (1990). Strategic information technology investments: guidelines for decision making. *Journal of Management Information Systems*, 7(2), 9-28.
22. Cohen, J. A. (2011). *Intangible assets: valuation and economic benefit* (Vol. 273). John Wiley & Sons.
23. Córcoles, Y. R. (2010). Towards the convergence of accounting treatment for intangible assets. *Intangible Capital*, 6(2), 185-201.
24. Corrado, C., Hulten, C., & Sichel, D. (2005). Measuring capital and technology: an expanded framework. In *Measuring capital in the new economy* (pp. 11-46). University of Chicago Press.
25. Damodaran, A. (2007). Dealing with intangibles: Valuing brand names, flexibility and patents. *Flexibility and Patents* (April 7, 2007).
26. Erumban, A. A., & de Vries, K. (2015, November). Global Growth Projections for The Conference Board Global Economic Outlook 2016. New York: The Conference Board. accessible at www.conference-board.org/attach/GEO_Methodology_Oct20151.pdf
27. Elsten, C., & Hill, N. (2017). Intangible Asset Market Value Study?. *les Nouvelles-Journal of the Licensing Executives Society*, 52(4).
28. Egginton, D. A. (1990). Towards some principles for intangible asset accounting. *Accounting and Business Research*, 20(79), 193-205.
29. Hagelin, T. (2002). A new method to value intellectual property. *AIPLA QJ*, 30, 353.
30. Hall, B. H., Jaffe, A., & Trajtenberg, M. (2005). Market value and patent citations. *RAND Journal of economics*, 16-38.
31. Hirschey, M. (1985). Market structure and market value. *Journal of Business*, 89-98.
32. Kaplan, R. S., & Norton, D. P. (2004). Measuring the strategic readiness of intangible assets. *Harvard business review*, 82(2), 52-63.
33. Kaufmann, L., & Schneider, Y. (2004). Intangibles: a synthesis of current research. *Journal of intellectual capital*.
34. Khurana, I. K., Martin, X., & Pereira, R. (2006). Financial development and the cash flow sensitivity of cash. *Journal of Financial and Quantitative Analysis*, 41(4), 787-808.
35. Jarboe, K. P., & Ellis, I. (2010). Intangible assets: Innovative financing for innovation. *Issues in Science and Technology*, 26(2), 75-80.
36. Jansen, D. W., & Tsai, C. L. (2010). Monetary policy and stock returns: Financing constraints and asymmetries in bull and bear markets. *Journal of Empirical finance*, 17(5), 981-990.
37. Jiang, Y. (2019, February). A Preliminary Study on the Management of intangible Assets in Enterprises. In *2019 4th International Conference on Financial Innovation and Economic Development (ICFIED 2019)*. Atlantis Press.
38. Johnson, L. T., & Petrone, K. R. (1998). Commentary: is goodwill an asset?. *Accounting horizons*, 12(3).

39. Joia, L. A. (2000). Measuring intangible corporate assets. *Journal of Intellectual capital*.
40. Laughton, D., Guerrero, R., & Lessard, D. (2008). Real Asset Valuation: A Back-to-basics Approach. *Journal of Applied Corporate Finance*, 20(2), 46-65.
41. Leitner, K. H. (2005). Managing and reporting intangible assets in research technology organisations. *R&D Management*, 35(2), 125-136.
42. Lev, B. (2003). Remarks on the measurement, valuation, and reporting of intangible assets.
43. Lev, B. (2004). Sharpening the intangibles edge. *Harvard business review*, 6, 109-116.
44. Marr, B. (2007). Measuring and managing intangible value drivers. *Business Strategy Series*.
45. Matsuura, J. H. (2004). An Overview of Intellectual Property and Intangible Asset Valuation Models. *Research Management Review*, 14(1), 33-42.
46. Montaña, J., & Nomen, E. (2007). *Process to determine if a trade mark qualifies as a well-known mark or reputed mark*. Buenos Aires; Madrid: Instituto de Analisis de Intangibles.
47. Richardson, S. (2006). Over-investment of free cash flow. *Review of accounting studies*, 11(2-3), 159-189.
48. Roos, G., & Roos, J. (1997). Measuring your company's intellectual performance. *Long range planning*, 30(3), 413-426.
49. Rodov, I., & Leliaert, P. (2002). FiMIAM: financial method of intangible assets measurement. *Journal of intellectual capital*.
50. Sacui, V., & Szatmary, M. C. (2015). Intangible assets in business combinations. *Revista de Management Comparat International*, 16(3), 385.
51. Smith, G. V., & Parr, R. L. (2000). *Valuation of intellectual property and intangible assets* (Vol. 13). Wiley.
52. Stolowy, H., & Jeny-Cazavan, A. (2001). International accounting disharmony: the case of intangibles. *Accounting, Auditing & Accountability Journal*.
53. St-Pierre, J., & Audet, J. (2011). Intangible assets and performance. *Journal of Intellectual Capital*.
54. Teece, D. J. (1998). Capturing value from knowledge assets: The new economy, markets for know-how, and intangible assets. *California management review*, 40(3), 55-79.
55. Trigeorgis, L. (2005). Making use of real options simple: An overview and applications in flexible/modular decision making. *The Engineering Economist*, 50(1), 25-53.
56. Penman, S. H. (2009). Accounting for intangible assets: There is also an income statement. *Abacus*, 45(3), 358-371.
57. Powell, S. (2003). Accounting for intangible assets: current requirements, key players and future directions. *European accounting review*, 12(4), 797-811.
58. Walker, R. G. (2009). Discussion of lev, Radhakrishnan and Zhang. *Abacus: A journal of accounting, finance and business studies*, 45(3), 299-311.
59. Wang, A., & Halal, W. (2010). Comparison of real asset valuation models: A literature review. *International Journal of Business and Management*, 5(5), 14-24.
60. Wyatt, A. (2005). Accounting recognition of intangible assets: theory and evidence on economic determinants. *The accounting review*, 80(3), 967-1003.
61. Wyatt, A. (2008). What financial and non-financial information on intangibles is value-relevant? A review of the evidence. *Accounting and business Research*, 38(3), 217-256.
62. Zambon, S., Lev, B., Abernethy, M., Wyatt, A., Bianchi, P., Labory, S., & DEL BELLO, A. (2003). Study on the measurement of intangible assets and associated reporting practices.