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STOCK MARKET VALUATION OF HUMAN CAPITAL

A systematic literature review

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Abstract

Human capital has increasingly become a key resource that creates value in a modern, knowledge-based economy. While human capital has attracted interest of many researchers, in particular from the area of strategic management and human resource management, the literature related to stock valuation of human capital is pretty scarce. The main goal of this paper is to systematically review studies that examine how stock markets evaluate human capital, determine the main existing findings and offer suggestions for further research. As the basis for this paper, 24 articles published over the last ten years were reviewed and analyzed with regards to their main characteristics: human capital valuation, intellectual capital valuation, stock market valuation of human capital. The data show an increased interest in the topic recently, as well as the employment of new empirical approaches to approximate for human capital investment and its association with stock price. Valuation of human capital has been empirically tested on a wide range of both developed and emerging stock markets. Majority of the reviewed studies found a positive association between human capital on the one side, and financial performance and stock market value on the other.

Keywords: human capital, stock market valuation, systematic literature review

1. Introduction

"*Human capital has been considered and defined by many, fully understood by a smaller subset, and yet formally valued by practically no one. Managers and investors alike woefully neglect human capital inputs and outputs, even though they may far outweigh the more traditional assets appearing on the balance sheet.*" (Sollosy et al., 2016)

Indeed, human capital has attracted a lot of interest over that last few decades. Human capital embodies the knowledge, skills, health, and values that contribute to making people productive (Benzoni and Chyruk, 2015). As such, human capital has become increasingly important driver of the value creation for companies in the knowledge-based

economy. Their long-term financial performance and overall competitive advantage are strongly associated with it. Therefore, the evaluation of the company's total capital should include the estimate of its human capital, or rather the enhancement of the knowledge, skills and intrinsic attitudes of the personnel (Ferraro and Cristiano, 2019).

Although the importance of human capital has been studied extensively, estimating the value of human capital is hard. Traditional financial statements, the way how they are currently designed, fail to capitalize or recognize the value of the human capital as an asset in the balance sheet. Accounting principles suggest a simple rule to separate capital expenses that create benefits over multiple years, from operating expenses that create benefits only in the current year. Using the argument that the benefits of spending on employees are too uncertain, and that companies do not possess control over their employees, accountants treat spending on employees as operating expenses (Damodaran, 2006). Consequently, the accounting misclassification of employee expenses can create problems when investors value knowledge-based firms. The reported operating income for these firms as well as their book value of assets will be understated, and they report small capital expenditures relative to both their size and growth potential (Damodaran, 2006; Pryor, 2015). Although Damodaran (2015) offers the methodology to deal with these valuation issues and to capitalize expenses on employees, the problem arises with respect to the extent to which employees related data are disclosed in annual corporate reports. While European companies are required to disclose personnel expenses, US GAAP has no requirement for expenses to be classified according to their nature or function. However, even under IFRS, financial reporting on personnel expenses is still not granular enough to separate precisely employee spending which creates long-term benefits from short-term employment benefits. Therefore, valuations of knowledge-based companies, whose value creation relies on human capital, potentially results in distorted intrinsic value of the firm (Zingales, 2000; Eisfeldt and Papanikolaou, 2013; Regier and Rouen, 2023).

As mentioned above, the topic on human capital, as a component of intellectual capital, has been investigated by various researchers, in particular from the area of strategic management and human resource management. However, only a small number of studies analyzed the impact of company's human capital on firm's stock market performance. In theory, the value of the firm is the present value of the future cash flows generated by the company's assets, both tangible and intangible. If human capital contributes to a sizeable component of market value of intangibles, then it should also have an impact on market value of the firm (Pantzalis and Park, 2009). The main goal of this paper is to systematically review the studies that examine how stock markets evaluate human capital, i.e. whether investors recognize the value of human capital and factor them into their stock valuations, despite accounting measurement issues built in the traditional financial statements which present the base for discounted cash flow valuation.

The paper is organized as follows. Section 2 presents data and methodology. Section 3 presents data analysis and the overview of main findings of studies conducted over the last ten years. Section 4 concludes, identifies limitations of the study, and suggests future research direction.

2. Data and methodology

A systematic literature review was used as the method to gather and review the data from recent publications on how stock markets price human capital. The RIT Wallace Library was selected as the tool for identifying the publications needed for analysis. The RIT Wallace library provides access to more than 230 electronic databases, over 300 print journal titles, over 98,000 electronic journal subscriptions, more than 550,000 electronic books, as well as huge collection of multimedia sources (RIT Wallace Library, 2023). The keywords used in the search query were "stock market valuation human capital". A total of 2,581,913 documents were identified, including journal articles, (e)books, reports, newsletters and newspaper articles. Next, a filter was applied to restrict the sample to relevant publications. The search parameters, exclusion and inclusion criteria are shown in Table 1. To be more precise, filters regarding type of publication, language, publication time window, discipline and keywords were applied, to detect only scholarly and peer-reviewed journal articles, with full text available online, both open access and non-open access documents, written in English over the last 10 years. Also, the words "human capital", "intellectual capital" and "valuation" had to be included anywhere in the abstract and subject terms. However, such a broad search resulted in 102 publications, many of which aimed to investigate topics beyond the scope of this paper. Through the manual screening of the publication titles and abstracts, 24 publications examining only a direct relationship between human capital and stock market value were selected for the analysis.

Table 1. The search query parameters

Description	Conditions	No of documents
Search query	"stock market valuation human capital"	2,581,913 documents
Type of publication and access	Scholarly and peer-reviewed journal articles; full text online; both open access and non-open access documents	74,638 documents
Language	Search was limited to documents written in English	74,356 documents
Time window	Search was limited to documents written in the last 10 years	41,940 documents
Discipline	Business	16,353 documents
Keywords analysis	Abstract and subject terms contain words "valuation" and "human capital" anywhere	102 documents
Manual screening and cleaning	The relevance of the documents was further manually checked	24 documents

3. Results and discussion

This paper provides a review of 24 most relevant journal articles published about how stock markets attach the value to human capital, published in the period between 2014-2023. The results of the analyzed studies provide interesting insights about the current state of research in this area.

The data indicate a substantial interest in exploring the topic of human capital, supported by 16,353 peer-reviewed journal articles in the area of business over the last ten years. However, when the search was refined to find evidence of the impact of human capital on firm value, the literature body is pretty scarce. Out of the 102 documents that contained words "valuation" and "human capital" and "intellectual capital" anywhere in the abstract or in subject terms, after using manual cleaning only 24 papers remained relevant for analysis. The relationship between human capital investment and firm's stock performance remains a challenge to research, due to measurement issues related to human capital. However, approximately one third of analyzed papers were published in the period 2021-2023, indicating that empirical analyses on this topic are timely.

The journal with the most published papers on the researched topic was *Journal of Intellectual Capital*, with four articles published, followed by *The Journal of Corporate Accounting and Finance*, with two published documents.

The main research question of this paper was to find evidence if stock markets attach the value to human capital. The main challenge for researchers is to find appropriate measure or proxy for human capital value, since financial reports, at least how they are currently designed, fail to recognize this category appropriately. According to Vithana et al. (2023: 1215),

> "*A clear research gap exists in our knowledge, mainly in relation to the inadequacy of empirical evidence to suggest that external stakeholders, such as investors, should take an investment perspective based on the future earning potential of employees, rather than treating HCR (human capital resources) as an expense or budget item to be curtailed. Additionally, how the stock market reacts to firm level HCR investment is still to be addressed, due primarily to the absence of an equitable measure reflecting firm level HCR as an investment—due to the future earnings/value creation potential of employees—instead of viewing them solely as an expense*."

The most recent studies introduce a relatively novel approach to approximating human capital investment. Vithana et al. (2023) and Regier and Rouen (2023) use personnel expenses obtained from the income statement to examine the stock market valuation of this investment. Since personnel expenses contain both short-term employment benefits, as well as expenses for training and development, which create long-term value, if a substantial portion of personnel expenses represent the latter, then this part of personnel expenses can be treated as an investment in human capital. Regier and Rouen (2023) perform analysis on a large sample of firms across 30 European countries, and find that the future value of personnel expenses (PEFV) is positively associated with firm characteristics of human-capital-intensive firms, such as growth opportunities and size. They also find that stock market prices PE current portion negatively and its future value positively. Examining firms listed in the Financial Times Stock Exchange (FTSE) 100 over a five-year period, Vithana et al. (2023) suggest that investors perceive investment in employees to generate more return in the longer-term.

Riley et al. (2017) use event study methodology to examine the relationship between firm's investment in human capital and training and its subsequent financial performance. Their results show that firms receiving and award for their "excellence in training and human capital management" have significantly positive abnormal stock returns. After completing

the event study, the authors run regression analysis using the abnormal return measures for each firm with the aim to better understand factors affecting the extent to which firms benefit from investing in the human capital of their employees. The empirical evidence shows that "in the presence of high human capital investments, the higher the interaction of R&D intensity and physical capital intensity, the greater the positive stock price reaction to the signal of above-average investments in human capital and training" (Riley et al., 2017).

Another stream of literature explores whether various components of intellectual capital (human, relational, innovation, and process capitals) have meaningful information on firm value (Çam and Özer, 2022; Ni et al., 2021; Magau et al., 2021; Özer and Çam, 2016; Yu at al., 2015;). Ni et al. (2021) find that firm value is affected positively by the average net profit per employee as well as goodwill and intangible assets. Although the study suffers from the data limitations inherent for emerging market like Taiwan Stock Exchange on which study was conducted, making it difficult to generalize results for the developed markets, authors conclude that firms should nevertheless make efforts to develop intellectual capital to be able to operate competitive businesses. Yu at al. (2015) also carried analysis on Taiwan's stock market, examining whether IT companies with more intellectual capital are more likely to be mispriced in period from 2003-2006. Having distinguished between human capital (measured by employees holding graduate degrees and ratio of labor costs to net sales), innovation capital (measured by R&D intensity and royalty ratio), process capital (measured by working capital turnover and fixed asset turnover), and relational capital (measured by marketing expense ratio and sales growth rate), they conclude that Taiwan's stock market has a tendency to overprice IT companies' innovation capital but underprice their human, process, and relational capital, with mispricing problem being more prominent on the human capital than on the other three types of intellectual capital. Çam and Özer (2022, 2016) use extended Ohlson model on the large sample of Turkish firms. Their studies show that higher levels of measures of various types of intellectual capital are directly associated with higher stock prices. Furthermore, they find that intellectual capital and its components have lagged effects on market values of firms, and human capital has a moderating effect on the relationship between other intellectual capital components and firm market values.

Mačerinskienė and Survilaitė (2019) use four component model (human capital, structural capital, juridical capital, relational capital) on a sample of 58 companies listed on the Nasdaq Baltic stock exchange to confirm that intellectual capital of tested companies has a positive impact on their market value. Nevertheless, the market value is not affected by each component equally, and human capital and relational capital have the greatest influence on the market value of listed companies.

Tandon et al. (2016) and Bryl (2018) investigated whether human-capital-orientated firms generate positive financial performance. Tandon et al. (2016) measure the intellectual capital (IC) of the firms listed on CNX Nifty in period from 2004-2014 and empirically examine the relationship among intellectual capital, financial performance and market valuation of these firms. Using Pulic's Value Added Intellectual Coefficient (VAIC) that tests the efficiency of three types of capital: human capital, measured by the cost of employees; structural capital, measured by the difference between the value added generated by the firm and human capital; and physical and financial capital employed, authors find that

there was a positive association between VAIC and all the measures of financial performance such as profitability, productivity and market valuations. In particular, human capital efficiency was found to have a strong positive association with profitability. Results of Bryl's study (2018) not only verify the hypothesis that human capital orientation is associated with high profitability, but also provide the evidence that it leads to above-average financial performance. Bryl (2018) conducted research on a sample of 7,204 publicly listed companies from the American stock market for the 2007-2017 period. The author divided companies into two groups: human-capital-orientated firms (identified using "100 Best Companies to Work For" listing) and the benchmark group composed of US-based publicly listed firms from 11 industries to compare their results on financial performance, and concludes that human-capital-orientated firms' financial performance is above-average.

Nimtrakoon (2015) and Xu and Li (2019) also examine the relationship between firms' intellectual capital, market value, and financial performance, however they modify Pulic's Value Added Intellectual Coefficient model, and add a fourth component – relational capital efficiency. Both papers suggest a positive relationship between intellectual capital and financial performance. Nimtrakoon (2015) investigates 213 technology firms listed on five ASEAN stock exchanges and finds no significant difference in Modified Value-Added Intellectual Coefficient (MVAIC) across five ASEAN countries; however, firms in each country tend to place a different degree of emphasis on components of MVAIC to generate corporate value. The results suggest that firms with greater intellectual capital tend to have greater market value as well as better financial performance (measured by margin ratio and return on assets). Capital employed efficiency and human capital efficiency are found to be the most influential value drivers for both market value and financial performance, while structural capital efficiency and relational capital efficiency displayed less importance.

Xu and Li (2019) performed similar analysis on 116 high-tech and 380 non-high-tech small and medium-sized enterprises (SMEs) operating in China's manufacturing sector and listed on the Shenzhen stock exchanges between 2012–2016. The results indicate a positive relationship between intellectual capital and financial performance of both high-tech and non-high-tech SMEs. However, impact of intellectual capital on earnings and efficiency is greater in non-high-tech SMEs than in high-tech SMEs, while the impact of intellectual capital on profitability is weaker in non-high-tech SMEs than in high-tech SMEs.

Alfraich (2017) shows that intellectual capital disclosure in the corporate annual reports of Kuwait Stock Exchange (KSE) listed companies in 2013 is positively associated with their market value. Putra and Ratnadi (2021) explore how intellectual capital, divided into three categories - human, structural and external capital, and the types of their disclosure, impact firm valuation using annual reports of banks listed on the Indonesia Stock Exchange from 2015-2019. The results indicate that an average of 49.9 percent of disclosed data are expressed in the form of a narrative, 16 percent is in the form of a combination of qualitative and quantitative indicators, 7.5 percent is in the form of numbers and 1.44 items are expressed in the form of monetary units, while an average of 24.3 percent of items of disclosure were not disclosed. Intellectual capital disclosure has a positive impact on firm value. Magau et al. (2021) investigate the extent to which human capital disclosure could predict expected future earnings of the Johannesburg Stock Exchange (JSE)-listed companies. The authors construct disclosure index with a seven-point scoring system to

discover that human capital disclosure creates shareholders' value and improves the investors' buy-sell-hold decisions.

Forte et al. (2017) conducted a study on 140 Italian companies listed on the Milan stock exchange during the period 2009-2013 and find that intangible assets, profitability, leverage, industry type, auditor type, and family ownership positively affect intellectual capital value, whereas size and age of the firm negatively affect intellectual capital value. Forte et al. (2017) measure intellectual capital in terms of the market-to-book ratio, and suggest that through the holistic effect, the market-to-book ratio may be a good proxy for intellectual capital.

Abhayawansa et al. (2015) explore the role of intellectual capital information in sell-side analysts' fundamental analysis and valuation of companies. Using in-depth semi-structured interviews, the authors find that capital market participants use intellectual capital information to form analysts' perceptions of the overall quality, strengths and future prospects of companies; in deriving valuation model inputs; in setting price targets and making investment recommendations; and as an important and integral element in analyst-client communications.

Interestingly, the results of the study performed on the 42 companies listed on the Bucharest Stock Exchange by Ionita and Dinu (2021), show that intangibles classified as innovative competences do not have a positive impact on sustainable growth rate and firm value of Romanian companies. Authors conclude that companies need to recognize the importance of intangible assets and invest more in profitable ones in order to achieve sustainable growth and increase company success.

Adelowotan (2021) explores the nature and usefulness of human capital disclosures from the perspectives of the HR managers of the top 60 Johannesburg Stock Exchange listed companies in South Africa. In the survey, managers were given the checklist containing 91 human capital disclosure items and then were surveyed to determine which of these items they provide for inclusion in the corporate annual reports of their respective companies, and state whether those items are considered important to value creation. The results suggest that although the HR managers considered majority of the human capital items important, they were not being disclosed in the corporate annual reports of their companies.

Krausert (2018) develops theory about an agency problem affecting the strategic human capital of the firm. Krausert (2018) claims that dispersed shareholding, firm coverage by securities analysts, and their practice of publishing quarterly earnings forecasts imply a trade-off between near- and long-term performance, in favor of near-term performance. To restore the balance, securities analysts would need to distinguish transitory from recurring effects of human capital related choices in their valuation models as well as anticipate long-term effects in their long-term earnings forecasts.

4. Conclusion

The aim of this paper was to explore the findings of research studies on how stock markets evaluate human capital. The scope of analysis was limited to peer-reviewed journal articles published over the last 10 years. The results show that this topic has been covered by many diverse authors, documents, and journals. Within the research period, pricing of human capital has been empirically tested on a wide range of both developed and emerging stock markets, including stock exchanges from the USA, UK, panel of 30 European countries, Turkey, China, India, Taiwan, Italy, Baltic States, Romania, Indonesia, ASEAN countries, South Africa, Kuwait. Majority of the reviewed studies found a positive association between human capital on the one side, and financial performance and stock market value on the other. However, the limitation of all investigated studies appears to be a difficulty to find a good proxy for the value of human capital, in the absence of such item in the accounting financial statements. I believe that further research should build on the most recent studies (Regier and Rouen, 2023; Vithana et. al., 2023) and explore new avenues on how personnel expenses could be used in approximating the value of human capital. Nevertheless, valuation of human capital is not only a challenge for scholars investigating this topic, but also for investors who attempt to estimate, as best as they can, the value of human capital for stock pricing purposes. If human capital is a source of value, then company's expenditures on recruitment, education and training, and enhancing employee loyalty are more capital expenditures than operating expenses. Therefore, a detailed breakdown of employee spending is needed, so that investors doing valuations could separate precisely expenses which create long-term value, and hence increase stock price, from short-term employment benefits. However, value creating employee expenses have to be assessed taking into account the risks associated with human capital, such as employee turnover, key person(s) losses, skills shortages, or lately, the potential impact of technological advancements. Therefore, the practical implication of this literature review findings is a suggestion to regulators to continue to work on improvement of financial reporting standards, with the aim to introduce a requirement for publicly traded companies to disclose more detailed information on value creation components of intellectual capital in their annual reports. In the meantime, managers should become more aware of the role that human capital plays in the knowledge-based economy, and in equity valuation, and hence increase the level of disclosure. In other words, in the absence of regulatory requirements, managers should voluntarily disclose information related to human capital with higher level of granularity, with respect to both value creating employee expenses as well as human capital risks, to help investors evaluate how human capital is managed on both strategic and tactical level, and ultimately, estimate its value accurately. From the methodological perspective, future literature reviews would benefit from using PRISMA guidelines (Moher et al.), as well as from more sophisticated software tools for constructing and visualizing bibliometric networks, as it would enable even more systematic analysis of reviewed papers, and possibly more precise conclusions.

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