The Measurement of Human Capital and its Effects on the Analysis of Financial Statements

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Users take financial statement information as a reference of making decisions. However, financial statements today do not properly report, measure and disclosure human capital that creates intelligence and competence advantages properly. Thus the usefulness of financial statements is diminishing. This paper introduces importance of proper disclosure of human capital in financial statements. And suggests ways to disclose and to measure the human capital. Then it uses the results of a high-tech company in Taiwan to present the effects of recognizing human capital as capital investment on financial statement analysis formulae.

Introduction

Today, intangible knowledge and intelligence that derive from human capital are critical inputs in the profit creating process. These changes have great influence on the accounting measurement of enterprises that rely heavily on human capital. According to a survey to American industries, companies that have the highest return on average stockholders' equity are in semi-conduct industries, software and data processing industries and the banking industries (Dorfman, 1996). They are high-tech companies and service oriented companies that provide intelligence integrated products and services developed by human capital. Human capital has become the main input in creating product value.

However, financial statements lack proper reporting, measurement and disclosure on human capital (Wintermantel & Mattimore, 1997). The traditional accounting lacks proper measurement and reporting on human capital — the bases to create value and competitive advantages (Ulrich, 1998). When the human capital has replaced the function of traditional assets, the present financial statements no more satisfy the demand of creditors, investors and researchers. When company book value and asset book value calculated under this system are more and more departure from their markets, the correct resources that companies controlled and the potential they have are also away from the reality. The accounting system believes over optimistic estimate made by companies will distort the reality of the accounting reports. It treats human capital cost as an expense, not an asset (Hermanson, et al., 1992). Under the circumstances, the importance of proper disclosure and measurement of human capital is totally ignored, which makes the usefulness and content of the information provided by the present accounting system are limited (Beverly, 1992).

Studies have shown that proper investing and using human capital will benefit to organization performance and increase the productivity (Acemoglu & Pischke, 1999).

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And it is also verified that human capital is related to organization performance and profitability (Arthur 1994). So that we can refer that human capital is a critical element of modern businesses and its importance is just like physical assets we have used before. Ignoring the proper disclosure and sound measurement of human capital are will reduce the usefulness and the reliability of the statements and mislead the manager to make improper decisions. For example, the investors do not have faithful information from the statements for decisions or company managers will make a shortsighted decision to discharge valuable employees for immediate and better net income figure.

As taking human capital into capital consideration is more complex than expenses them all, company also have to face the issue of future benefit uncertainly after capitalizing human capital. Once we found the cost of ignoring human capital will larger than the benefit from expenses it. It is more appropriate to consider the problem earlier and make the rules to provide the possible solutions.

Literature Review

The so-called costs or investments do not refer to an absolutely fixed set of accounting items but vary according to the business objectives. Some human expenditure of companies should be considered as human capital. For example, companies' training programs, not in order to pay the labor or services provided in the past or during the short-term period but in order to add value of employees in the future, it is the investment of human. Existing literature approaches the definition of human capital mainly in three ways: the transaction cost economy theory, the human capital theory and resource-based view of the firm theory.

The transaction cost economy theory presumes that companies choose to employ personnel in the most efficient way (Argyres and Liebeskind, 1999). Companies choose the most efficient way or combination by comparing all relevant costs (Riordan & Williamson, 1985). Within the context of this theory, human possess the properties of specificity and uncertainty is considered as human capital, and estimate its investment with one approach above.

The human capital theory emphasizes that companies decide on the amount of human capital investment they will make by comparing it with the potential future benefits, for instance, improvements in production controls. Human capital in this context refers to technical training and knowledge buildup for employees. Investments are especially focused on training employees' specialized skills and avoiding these skills to be used by other companies (Flamholtz, 1972). Human capital referred to in this theory must possess the properties of specialized skills and non-transferability.

The resource-based view of the firm theory advocates that core skills central to a company's competitive advantages must be acquired from internal development within the company itself and that general technology can be acquired from outsourcing. Core skills are characterized by properties such as value, rareness, not being imitable and immobility (Barney, 1991). Talents capable of core skills are the human capital deserving attention and investments from companies.

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According to those theories, this paper defines human capital as investments made by company in talents and technologies that benefit competitive advantages, are valuable and unique, and should be kept out of reach of other companies. In other words, only employees possessing these qualities are qualified as human capital. Barney (1991) pointed out that the skills of employees are a company's assets just like tangible assets. In particular, the employees with core skills are the fountain source for company to raise competence and profits (Porter, 1985). Therefore, investments in this kind of employees, i.e. human capital investments, should be the focal point of our attention (Porter, 2001).

To sum up, a company's investments in human capital are investments in the personnel who contribute to a company's strategic goals, demonstrate uniqueness and high value and are barred by the company from being employed by other competitors. Companies can improve production efficiency, product or service quality, and product differentiation, thereby obtaining strategic competitive advantage (Ruchala, 1997).

In high-tech industries, R & D employees in integrated circuit design companies are qualified for the high value and uniqueness of human asset. The competitive advantage of those companies comes from the cumulative experience of R & D, which represents their R & D capabilities, and the registration and authorization of complete system chips and other chips can be protected. Their products are manufactured under their patents. The patents prevent their competitors from using their accomplishment. That makes the investment in R & D human valuable.

Human resource accounting is the procedure to distinguish and measure human resource and to provide data for the reference of users (AAA, 1973). The purpose of human resource accounting is to present human resource variables as the references in managerial decisions through the financial report. Since the focus of production of developed countries has been changed from traditional to high-tech and service industries, and the importance of employee value has increased day by day, human resource accounting has become a critical issue to study (Flamholtz, 1985). This paper focus on how and what human capital inputs should be considered.

Research Results

There are four ways to disclosure human capital in financial statements and related documents:

(1) Disclosure human capital in the president's letter in the company annual report: For example, company investment in human capital and the description of possible effects on critical employee turn over.

(2) Present human capital as notes in the financial statements: The financial statement notes work as illustrations of the accounts themselves or account numbers. The insufficiency of human capital disclosure in business can be fixed by exposing them in the notes. The expression of notes may not necessarily be numerical form (Van Buren, 1999). It can be sentences description.

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(3) Record human capital as an intangible or other asset in the financial statements: The role of human capital in high-tech companies is as important as hard assets in–the traditional industries. The only difference is the invisibility of human capital. Just like goodwill, copyright and franchise, human capital can be recorded in the financial statements as intangible assets.

The disputes in human capital disclosure methods described above are recording human capital as assets. An asset must be qualified for three characteristics. It must be owned by the business, has future benefit and can be valued in monetary units (Kieso & Weygandt. 1992). We must clarify that businesses do not own employee's physical bodies and human beings, of course, are not slaves, the businesses own the knowledge and skill developed by human brains (Schultz, 1961), which are the two key elements of company development and company performances (Arthur, 1994). That is where the future benefits come from. In other way, we can see the similar case in accounting for lease. Companies can put those leased assets on their own financial statements without the ownership of them. Here what accounting cares about is how much benefit that the businesses can take from the leased assets, not the ownership. Similarly, we use the attribute of human capital- uniqueness, to isolate it as assets from the financial statements, and calculate its monetary value.

Researchers (Carme, et al. 1999) have provided three new rules when presenting human capital as an asset. 1. The benefit results from human capital must meet the future profit of business. 2. Human capital accounts and numbers can be observed by the independent party objectively and 3. The businesses have a good control on human capital. According to the analysis, we can collect human capital from three different human capital development periods. They are human capital acquisition costs in the early period, education and learning costs in the developing period, and position replacement costs in the ending period (Flamholtz, 1973).

1. The acquisition costs in the early period: The recruitment, selection, hiring and orientation costs are direct costs of human capital acquisition costs. They are costs direct related to recruit prospective employees from the open market, spent for locating and identifying human capital. Selecting costs are costs spent for the procedure of interviewing the prospective employees. Hiring and orientation costs indicate the costs to settle down the employees.

2. The learning costs in developing period: The learning costs include direct costs, such as orientation costs, general training costs and on-the-job training costs, and indirect costs, i.e. opportunity costs of the trainers' time. The purpose of learning is to help employees to acquire the necessary skills and to accumulate the experience. Orientating employees will help them to understand the company policy, products, machinery and company environment.

3. The replacement costs in the ending period: The replacement costs include the discharge cost, the opportunity cost of losing efficiency before discharge and the cost of arranging vacant positions.

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According to the costs mentioned above, the related accounting accounts of human capital can be summarized as follows: (1). The salary expense of staff that recruiting activities. (2). The advertising expense during the recruitment period. (3). The necessary travel and moving expenses for the prospective employees. (4). The managerial expense related to the recruitment activities. (5). The salary expense of the new employee before officially become a member of the company. (6). The training costs. (7). The opportunity costs caused by vacant position and new employment. (8). The opportunity costs caused by the low efficiency before discharging the employees.

Number (1) through (6) is recognized as expenses in the Income Statement of financial accounting now. We suggest isolate these costs from the Income statement and disclose them as valuable assets. However, costs in number (7) and (8) are classified as opportunity costs in the managerial accounting and they are only for the references of decision-making. Namely they are calculated on demand and are not shown on the financial statements. Usually, it is hard to locate and isolate these opportunity costs.

Investors oftentimes use the financial statement analysis ratio as the bases of investment decisions (Smith, et al., 1997). In this paper, we use a Taiwanese high-tech company calculate the influence of financial statements analysis ratio by changing human capital expenditure from expenses to assets. The target company is an integrated circuit design company. Its R & D expenditure is almost the same as its fixed asset in 1998. Since the R & D is a critical process to gain product competency in the company, its employees in R & D department will meet the characteristic of "uniqueness" as valuable human capital.

Refer to our previous discussion"toward human capital, we search human capital in the R & D department for the acquisition costs in the early period, education and learning costs in the developing period, and position replacement cost in the ending period and related accounting accounts. Since the replacement costs in the ending period are all opportunity cost. They are not collected from the target company. These costs are collected from the accounting department of the company by interviewing its accounting manager. The result is shown in Table 1:

Table 1. Investment in human capital in different periods (Unit = US Dollar)

Human capital investment	1996	1997	1998
All recruitment costs	42,629	61,629	60,600
Ratio of R & D new employees to all new employees	0.5116	0.6064	0.5574
Costs of early period in R & D	21,809	37,372	33,778
Cost of developing period in R & D	66,857	85,400	110,543
Total	**88,666**	**122,772**	**144,321**

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If we turn the human capital cost above from expense to asset. The effect to the financial statement analysis formula will be shown in Table 2.

Discussion

The financial statement users, such as investors and creditors, use financial statement analysis ratio to evaluate their investment decisions. To change human capital expenditure from expenses to assets will in the following effects:

1. The company has more ability to repay the debt: The times interest earned have increased and the debt ratio is lower.
2. The company has more ability to make profit: The ratio of stockholder's equity to total assets has increased. The return on total assets has increased and the return on stockholder's equity has increased.
3. The company has better performance: The earning per share has increased and the ratio of net income to operating revenue has increased.

For the ability to repay the debt, the increases of times interest earned means what a business has earned this year can cover more times of interest expense than before. This is a positive signal to the money supplier of the company. The ratio of debt to total assets has dropped is a good news to the business also. The liability weights less than before.

Table 2. The effect to the financial statement analysis formula by changing human capital from expenses to assets

Financial statements analysis ratio	1996		1997		1998	
	Before Change	After Change	Before Change	After Change	Before Change	After Change
Time interest earned	2.52	2.64	2.42	2.54	1.76	1.84
Debt ratio	0.6622	0.6610	0.6442	0.6432	0.5527	0.5515
Stockholder's equity to total assets ratio	0.3378	0.3390	0.3558	0.3568	0.4473	0.4485
Rate of return on total assets	5.92%	6.11%	6.65%	6.83%	4.71%	4.89%
Rate of return on common stockholder's equity	15.39%	16.16%	14.34%	14.89%	5.79%	6.28%
Earning per share (EPS)	1.16	1.22	1.85	1.92	0.73	0.79
Net income to operating revenue ratio	2.28%	2.39%	3.37%	3.50%	1.53%	1.66%

*The amortization has been considered in 1997 and 1998. Assume all human capital occurs at the end of the year. The amortization period is 20 years.

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For the ability of profit making, the ratio of stockholders' equity to total assets is a measurement of stockholders' investment. Which has increased. Rate of return on total assets means the reward to company creditors and stockholders. It is a ratio to show how much money that a company can make by every dollar of asset. As the rate is increased, the chance to repay their investment is increased. Rate of return on common stockholders' equity is also called "return on equity". It means how much money that a company"can make on every dollar that the stockholders invested. Stockholders will happy to see that every dollar they spend can make more money.

EPS is one of the most popular financial statement analysis ratios. It is required by GAAP to disclose on the financial statements. It means that how much money that the company earned for every outstanding common shares. Investors will prefer to invest a company with higher EPS. The ratio of net income to operating revenue means the weight of net income in total revenues. The higher the weight, the more money the company makes. It is a positive sign to creditors and investors.

Conclusion

The succession of the human intellect over machines and equipment in the contribution to industrial value makes a financial statement that relegates human capital expenditure to expenses inadequate if not obsolete. This paper explores the definition of human capital and human capital expenditure classification within business, based on two interacting principles, i.e. the value of employees to competitive advantage and the uniqueness of employees. It is suggested that companies' human capital expenditure is analyzed in detail, and that the human capital investments conducive to competitive advantages are extracted from expenditure. Moreover, instead of listing human capital expenditure indiscriminately as expenses, this paper identifies the different stages of development of human capital to reflect the truth of important investments made by businesses in the process of survival, development and profit creation.

Unavoidably, definition of human capital and human capital expenditure classification may involve subjective interpretations. However, the establishment of systems is intrinsically subjective. The crux of the problem lies in the fact that more and more businesses rely on the intensive knowledge and methodology created by human resources to compete and survive. Is blindly relegating all the company's inputs on human resources to expenses really a superior alternative to the systemic tracing of the source of business competitive advantages and the treatment of human capital that creates competitive advantages as capital investments? This paper attempts to break this myth with the theoretical framework promulgated above and shows the effect of human capital expenditure to financial statement analyses.

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