Human Capital and the Balance Sheet

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Practitioners and personal finance textbooks generally exclude human capital when constructing balance sheets although this asset represents an individual's earning power and is liquidated over time to meet financial needs. Representing human capital on the balance sheet recognizes its importance as a factor in financial decisions. For many investors, including the value of human capital justifies an increase in the level of risk in the portfolio. The returns from human capital are often hedged with life and disability insurance which can also be incorporated into the financial statement. The intent of this presentation is to initiate a discussion on the place of a contingent asset such as human capital in a household's balance sheet.
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Introduction

A balance sheet is a financial picture of an individual or family at a point in time. Practitioners and personal finance textbooks commonly exclude the value of contingent assets from the balance sheet and thus do not convey an accurate financial picture. For example, a young physician might have a negative net worth if human capital is excluded from the balance sheet. His financial picture appears much worse than it really is. The physician has made a significant investment in his education in terms of both time and money, but the conventional balance sheet assigns this investment a value of zero. The physician's income statement clearly demonstrates his ability to earn a good salary. A financial institution would likely lend him money based on his future earnings; evidently the financial institution recognizes the value of his human capital.

Bodie, Merton, and Samuelson (1992) show that human capital significantly influences an individual's saving, consumption, and investment portfolio decisions over his life cycle. For example, younger people can generally invest a greater percentage of their investment portfolio in stocks because they have the ability to increase the amount of labor they supply to make up for losses. If individuals cannot accurately assess the value of their human capital, they make suboptimal financial decisions. Therefore, there is a need for the practitioner to assist an individual in assessing the value of human capital.

This presentation challenges the conventional approach by arguing that human capital is a significant asset for many people and should be recognized on the balance sheet. An accurate financial picture helps a client in several ways. First, it helps the client make better investment decisions because human capital significantly affects net worth and asset allocation. Consider the young physician who has recently seen his $50,000 stock investment fall to $25,000. A conventional balance sheet would show a significant reduction in his net worth; he would probably experience much anguish over this loss and might even sell stock to avoid future pain. However, if the value of his human capital is included on the balance sheet, the $25,000 loss has a moderate impact on his net worth. The pain is easier to bear, and the urge to sell stock is reduced. It is easier for the client to see the "big picture" if the balance sheet has a wide-angle lens.

A more comprehensive balance sheet helps the client see the approximate financial loss that can be suffered if he dies or becomes disabled. The young physician can see that most of his net worth results from his human capital and better understand the potential loss that would result from death or disability.

Insurance can be purchased to hedge these risks; however, this does not mean that the client should purchase insurance based on the value of their human capital. A needs approach is preferable for determining the necessary amount of insurance. The benefit to the client is that he sees how his financial picture can change if he does not hedge human capital.

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Recognizing the value of human capital guides clients in choosing the appropriate level of consumption. The lifetime consumption model says that people consider both current assets and future earnings in order to smooth lifetime consumption. An individual that expects his earnings to increase considerably in the future will likely consume more today. Including human capital on the balance sheet helps clients decide on an appropriate level of consumption that can be maintained in the foreseeable future. By presenting an accurate financial picture to the client --one that includes the value of human capital-- the client can better identify his optimum level of current consumption. Excluding human capital from the balance sheet forces the client to assess human capital on his own. He may overestimate it and subsequently overspend, or underestimate it and underspend.

Furthermore, by including human capital on the balance sheet, young people feel more confident about their financial condition. The conventional balance sheet discriminates against young people and makes it difficult for them to have a strong balance sheet. The young physician's net worth moves from negative to a high positive amount if his human capital is included.

It should be noted that valuing human capital is no simple task. It is similar to valuing a stock. In essence, expected future cash flows are discounted. The present value of these cash flows can change significantly based on modest changes in the discount rate and the projected growth rate of future earnings. The value of human capital is also impacted by the worker's health, age, job security, mortality rate, and household consumption. Two competent financial planners could calculate values for an individual's human capital that were significantly different, but each approach well justified. Likewise, two financial analysts could calculate justifiably different values for a company's stock price.

One of the strengths of the conventional balance sheet is its ease of construction. The financial planner simply looks up the values of assets and liabilities, places them on the balance sheet, and gets a financial picture of the client. The intent of this presentation is to encourage the financial planning community to consider whether the benefit of having contingent assets on the balance sheet outweighs the cost of departing from the conventional representation. The forecast may not be precise, but may be judged preferable to ignoring this critical asset.

The Conventional Balance Sheet

Chris is a 45 year old, tenured professor receiving after-tax income of $100,000 per year from his employer. Table 1 presents his current balance sheet constructed with the conventional approach. This approach is presented in textbooks such as Dalton and Dalton's Personal Financial Planning Theory and Practice (2001) and Gitman and Joehnk's Personal Financial Planning (2001). These books are used in many financial planning programs, and undoubtedly many practitioners are taught to construct balance sheets for their clients that are very similar to Chris's.

The conventional approach presents a conservative financial picture of the client. Assets commonly include savings accounts, brokerage accounts, defined contribution retirement accounts, automobiles, and homes. In order for an asset to be included, the individual must have the ability to fully liquidate it in a reasonably short period. The balance sheet indicates how much cash the client would have if he sold everything today and paid all of his debts. This information is undoubtedly helpful to some clients. Chris's balance sheet lists his assets at $395,000, his debts at $227,000, and his net worth at $168,000. It should be noted that the asset values do not take into consideration taxes. For example, when

Table 1.
Chris's Conventional Balance Sheet

Assets			Liabilities and Net Worth	
Cash/Cash equivalents			Current liabilities	
Checking account	2,500		Credit Cards	5,000
Savings account	2,500		Mortgage (current portion)	12,000
Invested assets			Long-term liabilities	
403(b) Bond Investment	40,000		Mortgage	210,000
403(b) Stock Investment	40,000			
Personal use assets			Net worth	168,000
Home	240,000			
Furniture	40,000			
Total assets		395,000	Total liabilities and net worth	395,000

defined contribution plans are liquidated, taxes must be paid. Thus, $100,000 invested in a defined contribution plan is not worth as much as $100,000 in a taxable savings account (Reichenstein; 1998).

In order to get an accurate financial picture of the client under the conventional approach, the practitioner needs to know the age of the client and must view both the balance sheet and the income statement. The age of the client and the income statement reveal the client's human capital, and the balance sheet shows his current assets and liabilities.

Incorporating Human Capital

Contingent assets differ from non-contingent assets in two ways. First, there is no guarantee that the individual will ever liquidate the asset. For example, receiving the full value of human capital is contingent upon living an average life span and maintaining employment at the current level. Reichenstein (2001) shows how an individual can hedge the financial risk of premature death by purchasing a term life insurance policy. If the death benefit equals the present value of expected future wages, a person's human capital is fully hedged against this risk. A disability can also impair human capital and can be partially hedged through insurance.

The risk to human capital that cannot be hedged is that the demand for the client's skill will fall and result in long-term unemployment. Market returns to human capital are partly random and partly controlled by the individual. For example, a worker may lose his job for reasons that are beyond his control; however, he can retrain himself and choose to postpone his retirement in order to maintain the value of his human capital. Human capital can decrease in value, but it is not likely to be zero unless the person chooses not to work. Even people that are out of the work force have some option value associated with their human capital; when unemployment falls and real wages increase, they can enter the labor force.

Divorce can also impact the value of human capital, as the returns to this asset are often divided by the court through alimony and child support arrangements. If these payments are excessive, the individual will have a disincentive to work and therefore fail to realize the full returns from human capital. Divorce can be factored into the calculation through a risk- sensitive discount rate.

Another way that contingent assets differ from other assets is that they cannot be fully liquidated in a short period. A car can generally be sold in a few days; however, there is not an active market where one can transfer his skill to a buyer for a fee. A surgeon can only sell his human capital one surgery at a time. An active market makes the valuation process easier, but is not essential to estimating value.

Human capital is simply the present value in terms of dollars that an individual's skills are worth over his expected remaining work life minus taxes and personal consumption. The human capital of a physician is undoubtedly greater than the human capital of a school teacher of the same age because the physician's skills are sold at a much higher rate. Also, a young person's human capital is greater than an older person's human capital holding other things constant because the young person has a longer expected work life.

It should be noted that human capital is a projected benefit and not an already-realized benefit. The individual has to work in order to liquidate his human capital. If the individual does not expect to work in the future, then the value of his human capital is reduced and would reflect an option value as the person could change his mind and begin working again. Bodie, Merton, and Samuelson (1992) recognize that an "individual's human capital is essentially the same as a financial asset, except that it is not traded." The value of human capital and financial securities each depend on projected cash flows and risk.

Valuing human capital is very similar to valuing a stock. Investment textbooks often demonstrate how to value a constant growth stock and a supernormal growth stock. In the case of a constant growth stock, one must assume that the dividend will grow at a constant rate forever and that the constant growth rate is less than the required rate of return. The constant growth rate is shown in Equation 1 below.

$$P_0 = \frac{D_1}{K_s - g} \tag{1}$$

P_0 is the current price of the stock, D_1 is next year's expected dividend, K_s is the required rate of return, and g is the constant growth rate. Textbooks generally show how the price of a stock changes significantly due to modest changes in D_1, K_s, or g. Many individuals' human capital can be estimated using this same concept. The primary difference is that corporations are assumed to have unlimited lives whereas people plan to retire at some point.

One method for estimating human capital that practitioners are familiar with is the human life value approach which was developed by Solomon Huebner in the 1930s. A simple formula for estimating a person's human capital is shown in Equation 2.

$$HC = W_{AT} * \left[\frac{1 - \frac{1}{(1+i)^n}}{i} \right] \qquad (2)$$

Where

HC = estimated present value of human capital

W_{AT} = current net after tax cash flow adjusted for personal consumption

n = expected number of remaining working years

i = inflation and risk adjusted discount rate

Human capital can be estimated by treating the worker's earnings, net of taxes and personal/family consumption, as an annuity that lasts his remaining work life. Forecasting future earnings and personal/family consumption are not easy tasks. The financial planner must take into consideration factors such as current and projected family size, health care needs, career advancement opportunities, and current and future marginal tax rates as these things and others will impact future discretionary cash flows.

The discount rate for the annuity is adjusted for risk and inflation and thus assumes that W_{AT} will grow at the rate of inflation. The yield on inflation indexed treasury securities with a maturity approximately equal to the remaining number of years in the workforce is an appropriate discount rate for a person who has excellent job security and is very healthy.

Choosing the appropriate risk-adjusted discount rate is another difficult aspect of estimating a person's human capital. Higher discount rates would be appropriate for:

- people in poor health and/or with a family history of poor health,
- people with little or no job security and skills that are not readily marketable,
- people who are young because long-term cash flow forecasts are more uncertain than near-term forecasts.

As an example, suppose Chris plans on working another 20 years (n) and has excellent job security. His earnings net of personal consumption expenditures and taxes total $50,000 per year ($W_{AT}$). Since Chris's job is very secure and he is in excellent health, an appropriate discount rate to use is the yield on twenty year inflation index treasury securities which is currently 2.5%. The estimated value of his human capital is $779,458, equivalent to a $50,000 ordinary annuity discounted for 20 years at 2.5%. Alternatively, if Chris had modest job security and average health, a more appropriate discount rate may be 5%. The value of his human capital in this scenario falls to $623,111.

For clients that expect earnings to grow faster or slower than inflation, financial planners can simply forecast future wages, adjusted for taxes and personal consumption, for the expected remaining working years and discount them at a nominal risk-adjusted discount rate.

There are at least four possible outcomes for one's human capital. First, one could live to retirement age, maintain current earnings, and thus liquidate human capital. Second, one could become permanently disabled prior to retirement and receive less than the full value of human capital. This risk could be partially hedged with a disability policy that covers 60% to 80% of pre retirement income. Third, one could die before retirement and receive less than the full value of human capital. Premature death can be completely hedged with a life insurance policy. Fourth, one could voluntarily or involuntarily choose not to work and thus receive less than full value of human capital.

The human capital formula (Equation 1) can be modified to account for disability and death (HCDD) as shown in Equation 3.

$$HCDD = HC * (1 - p_{dis}) * (1 - p_{death}) +$$

$$HC * R_{dis} * p_{dis} * (1 - p_{death}) + F * p_{death} \qquad (3)$$

Where

HCDD	=	risk adjusted value of human capital
HC	=	value of human capital calculated in Equation 2
p_{dis}	=	probability of disability
p_{death}	=	probability of death
R_{dis}	=	wage replacement rate of disability policy
F	=	face value of term policy

Equation 3 assumes a zero probability that the individual will lose his job for any length of time due to reasons other than disability and death. The value of the individual's human capital can be reassessed each year to reflect adjustments to these probabilities.

Suppose Chris has a 4% chance of permanent disability (p_{dis}), a 5% chance of premature death (p_{death}), a wage replacement rate of 0.6 if he becomes permanently disabled (R_{dis}), and a life insurance policy with a face value of $400,000 (F). The risk adjusted value of his human capital is

HCCD = $779,458 * (1-.04) * (1-.05) + $779,458 * .6 * .04 * (1-.05) + $400,000 * .05

= $710,866 + $17,772 + 20,000

= $748,638.

If Chris chooses not to purchase disability and life insurance, the risk adjusted value of his human capital is $710,866, the first term in the HCDD formula. The disability policy increases the value of his human capital by $17,772, the second term in HCDD formula, and the life insurance policy increases the value of his human capital by $20,000, the third term in HCDD formula.

By properly hedging human capital through the purchase of life and disability insurance, an individual can significantly reduce the financial exposure of these risks. Since human capital is an asset that significantly impacts an individual's saving, consumption, and investment portfolio decisions, it deserves serious consideration for inclusion on the balance sheet by financial planners in order to get a more complete financial picture.

The focus here is on the monetary value of individual capital which is a narrow definition of human capital. Dollahite and Rommel (1993) distinguish between individual and relationship capital as components of human capital. Individual capital is associated with the individual's earnings, health, and education. Relationship capital is associated with the strength of the bonds that the individual has created with others. Relationship capital is invaluable and would only be trivialized by attempting to value it in terms of dollars.

Balance Sheet with Human Capital

Table 2 presents a financial picture for Chris that is more complete than the conventional approach. The practitioner may find this balance sheet more useful in meetings with clients. The practitioner can show Chris that he has a substantial portion of his wealth tied to his employment and thus stress the need to protect this asset from the risks of disability and premature death.

The balance sheet can also be used to encourage Chris to save each year. Chris should be advised that his net worth will probably decline in the future as a significant portion of his human capital is consumed by his family. The practitioner, in consultation with the client, can project a target net worth at retirement and then estimate the optimal amount of money the client needs to invest each period in order to have a good chance at meeting this target. Investing regularly in financial securities will reduce the rate of decline in the client's net worth. As the individual gets closer to retirement, the return on financial securities will begin to have a significant influence on his net worth.

Table 2.
Chris's Balance Sheet with Contingent Assets

Assets		Liabilities and net worth	
Cash/Cash equivalents		Current liabilities	
Checking account	2,500	Credit cards	5,000
Savings account	2,500	Mortgage (current portion)	12,000
Invested assets		Long-term liabilities	
403(b) Bond Investment	40,000	Mortgage	210,000
403(b) Stock Investment	40,000		
Personal use assets		Total liabilities	227,000
Automobile	30,000		
Home	240,000	Net worth	916,638
Furniture	40,000		
Contingent assets			
Human capital	748,638		
Total assets	1,143,638	Total liabilities and net worth	1,143,638

The value of human capital can be included on the balance sheet in a special section titled "Contingent Assets." This section *could* also include the present value of other contingent assets such as vested Social Security benefits and defined pension benefits. These assets are similar to human capital in that they cannot be separated from the individual. The individual has to work in order to earn his human capital and must generally be alive to receive his Social Security and/or pension benefits. The value of these assets is based on projected cash flows and risk. Rose and Larrimore (2001) investigate whether or not an individual should start receiving a reduced Social Security benefit at age 62 or wait 3-5 years and receive a full benefit. In essence, they calculate and compare the NPV of each alternative. Their method can be used to estimate the present value of future Social Security benefits and defined benefit pension plans.

Placing contingent assets in a special section shows the client that these assets are different from other assets. Clients will need an explanation as to how contingent assets differ from other assets and how their value is estimated. The balance sheet in Table 2 allows the practitioner to determine the conventional estimate of the client's net worth by subtracting "Contingent Assets" from "Net Worth."

An alternative way of presenting human capital on the balance sheet is to reduce it by the face amount of any life insurance policy in force and keep the reduced amount in the "Contingent Asset" category. The face amount of the life insurance policy is shown as a non-contingent asset. For example, Chris's balance sheet in Table 2 would show a reduced value of human capital of $348,638 and would show a non-contingent asset entitled "Life Insurance in Force" of $400,000.

Implications for Investment Decisions

Including the value of human capital on the balance sheet makes it easier to determine a client's current asset allocation. Table 3 presents the current asset allocation for Chris under the conventional representation and the human capital representation. The conventional approach does not include the value of human capital. Excluding the $5,000 in cash since it is a working balance, Chris has a current asset allocation of 50% in bonds and 50% in stocks. If Chris desires to maintain this allocation, his next 403(b) contribution should be invested 50% in the stock fund and 50% in the bond fund.

Table 3.
Portfolio Allocations With and Without Human Capital Representation

	Conventional representation	Human capital representation
403(b) Stock Investment	40,000	40,000
403(b) Bond Investment and Human Capital	40,000	788,638
Stock Allocation	50%	4.83%
Bond Allocation	50%	95.17%

Since Chris has excellent job security, his human capital can be considered a fixed income investment, and his asset allocation is 4.83% invested in stocks and 95.17% invested in fixed income. If Chris desires a 50/50 asset allocation, his next 403(b) contribution should be invested 100% in the stock fund. In fact, he should transfer his $40,000 investment in the bond fund to the stock fund in order to move closer to his desired allocation.

This example assumes that Chris anticipates saving all of his human capital as it is liquidated. If, however, he anticipates saving 50% of his human capital, the retirement portfolio could be modified to include 50% of his human capital instead of 100%. Van Eaton and Conover (2002) and Hanna and Chen (1997) find that human capital significantly impacts an investor's retirement portfolio. If a young individual's human capital is categorized as a safe asset, then he should generally choose financial asset portfolios that are invested 100% in equities.

If an individual has risky employment, the value of his human capital can be split between a safe asset and a risky asset. For example, if the value of the individual's risky human capital is $500,000, $350,000 may be categorized as a safe asset, and the remaining $150,000 may be categorized as a risky asset. Clearly, human capital impacts the asset allocation decision.

Ackert, Church, and Englis (2002) hypothesize that younger people should invest a larger fraction of their portfolio in stocks because they have more labor flexibility and a longer investment horizon. However, they found that asset allocation decisions vary by gender, home ownership, net worth, and psychological orientation, but not by age. The conventional balance sheet reinforces this behavior. Under the conventional representation, Chris has 50% of his investment portfolio in stocks, and he would likely perceive that he has a modestly aggressive position. However, under the human capital representation, he only has 4.83% of his portfolio invested in stocks which would be judged a very conservative position. Practitioners may find it easier to convince younger clients to take more risk with their investment portfolios and also to hold tight when stocks fall in value as these paper losses are likely dwarfed by the human capital investment.

Many financial planners assess an individual's human capital indirectly by simply studying the income statement. Financial planners also consider human capital when advising younger clients to invest relatively more in stocks and to reduce this exposure as they grow older. Financial planners must decide whether the benefits of informing the client of the estimated value of human capital are greater than the costs. The benefits have been discussed throughout this paper and include demonstrating the importance of hedging human capital, helping clients better choose an appropriate level of consumption, and helping clients better choose and stay with an asset allocation strategy.

The costs of valuing and disclosing human capital to the client would be confusion for the client and a perception of sudden wealth leading to overspending. Younger clients may need additional counseling about this sizeable financial asset. They may ask questions such as "Why is my net worth falling as I get older?" or "Why do I need to invest in financial assets since I'm already rich?" Consumers in our society often engage in excessive spending and should not be encouraged to spend. However, others are compulsive savers; recognizing the potential wealth from their human capital will enhance their utility by greater consumption.

Financial planners will decide for themselves whether to include the contingent asset section on a client's balance sheet. Some financial planners may footnote it; others may find no value in the calculation or the presentation.

Conclusion

The intent of this presentation is to encourage the financial planning community to consider expanding the conventional balance sheet by including the value of contingent assets such as human capital and vested pension benefits. Human capital is simply an individual's discounted future earnings net of taxes and personal consumption. It is the most significant asset for many young people; including it on the balance sheet generally has a noticeable impact. The valuation process for human capital is no different than that for stocks and bonds. Its value depends on expected future cash flows and risk. Returns from human capital are contingent upon the individual working in the future and are often protected from loss due to premature death and disability.

The conventional balance sheet assigns human capital a value of zero. In order for this value to be correct, a person would have to immediately die without life insurance, become fully disabled without any form of disability insurance, lose his job and never find another one, or voluntarily choose not to work forever. The probability of any of these events happening is very low for many clients, and assigning their human capital a value of zero is extremely conservative. It should be noted that the value of human capital can vary considerably depending on the discount rate chosen. The discount rate reflects risks associated with the probability of job loss and health problems.

The value of human capital and the conventionally defined stock allocation are directly related. People with high levels of human capital can generally afford to take more risk with their financial

investments. If the investments perform poorly, the losses will seem less significant relative to human capital. Psychologically, it is easier to deal with the financial loss. Also, the individual often has the flexibility to erase losses by working harder or longer.

Many people estimate the value of human capital on their own and base important saving, consumption, and investment decisions on this estimate. There is an opportunity for practitioners to improve their clients' decision making by valuing human capital and representing it on the balance sheet.

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