Conventional wisdom holds that investors, as they age, should shift from equities to bonds. This prescription is sometimes justified by claims about lower risk from longer-term stock ownership. Another rationale stresses that stocks are riskier than bonds and that older investors have lower tolerance for risk. Lower risk tolerance for older investors makes sense if they have less ability to recover from a financial shock by working longer.

In contrast to conventional wisdom, the standard theory of portfolio allocation does not recommend that investors shift towards bonds as they age. Standard theory holds that the optimal portfolio is a combination of a broadly diversified equity fund and safe, risk-free securities. The optimal share of equity in a portfolio depends on an investor’s risk aversion, according to standard theory, but not age. This prescription for an equity share that is constant with respect to age emerges from a theoretical framework that ignores labour income.

In reality, labour income accounts for about two-thirds of national income and human capital is the largest component of wealth for many households. Human capital refers to the energy and skills that a worker brings to the labour market. The value of human capital derives from the current and future labour income the worker expects to earn. Because future labour earnings are uncertain, human capital is a risky asset. Recent research on portfolio allocation and asset pricing gives risky labour income a major role in the standard theory. This approach recognizes two important facts. First, dividends and wages affect consumption and portfolio decisions. Second, the share of wealth in the form of human capital declines as a worker ages.

We have pursued this life cycle approach with academics George Constantinides, John Donaldson and Paul Wilson. In this article, we apply the approach to portfolio allocation and asset pricing. We consider portfolio allocation and then turn to asset pricing and the “equity premium puzzle” discussed last week.

Portfolio allocation

Younger and middle-aged households have large, illiquid claims on income streams that flow from human capital and small business ownership. These claims are illiquid because they cannot readily be traded in capital markets in the same way as stocks and bonds. The value of this income fluctuates with news about wages and employment for workers and profits for small business owners. In addition, the value of human capital decreases with age for workers and business owners. As retirement draws closer, the value of expected future labour income declines, eventually reaching zero. To see how these facts matter for portfolio choice, start from first principles. From an investor’s perspective, the desirability of an equity security depends on the relationship between the investor’s future consumption and the future returns on the security. If the security is likely to pay off when consumption is low, the investor will look more favourably on it. Why? Because the marginal utility of consumption—the incremental improvement in well-being from a unit increase in consumption—varies inversely with consumption. So, investments that pay off when consumption is high are less valuable, other things being equal, than those that pay off when consumption is low. Imagine a security that pays high returns in circumstances that also put the investor’s job in jeopardy. For example, an energy crunch is often good news for oil company stock returns but bad news for workers who make and sell gas-guzzling cars. For such worker-investors, oil stocks tend to pay off well when labour income and consumption are low, and the
Risky human capital

This line of thinking has important implications for the way particular investors should structure their portfolios with due regard for the relationship between asset returns and shocks to the value of risky human capital. Other things being equal (such as expected returns, taxes, and transaction costs), workers should curtail or eliminate exposure to risky financial assets that do well in times of good news about their own labor income and raise exposure to financial assets that do well in times of bad news about their own income.

This principle is expressed using the concept of "covariance," which measures how closely two variables move together. That is, investors should hold more or less of a given financial asset in a portfolio, depending on whether it is positively or negatively correlated with the value of their own human capital and, indirectly, with economic conditions. Sometimes the requisite knowledge is evident, for example when an executive holds restricted equity in the company for which he works. Clearly, this manager has illiquid wealth risk (and thus wealth) that will move well precisely when the company stock performs well. He is well advised to structure his discretionary part of this portfolio to offset this high exposure to company stock.

More often than not, however, the requisite knowledge is not evident. Consider a 40-year-old steelworker. What is the relationship between the value of the steelworker's human capital and equity returns at the aggregate level? This principle, careful empirical research can uncover the requisite knowledge and imply a covariance between the returns on financial assets and the value of human capital. Unfortunately, this task has never been undertaken. The principle has not been applied to portfolio choice because no one has been able to provide an empirical foundation for better portfolio choice.

The principle implies several important messages. First, the correlation between equity returns and the value of human capital rises with the education level of the worker. Available evidence suggests that this relationship holds for aggregate equity returns, own-industry equity returns, and, perhaps, own-company returns as well. This evidence resonates with the view that the financial interests of capitalists are more closely aligned with highly educated professional workers than with less-educated, blue-collar workers.

The second implication is that less-educated workers should hold a larger fraction of their financial wealth in aggregate and own-industry equity than otherwise similar workers with more education.

The first story is true. More than anything else, it is the story of the "steelworker." The rise in the marginal utility of consumption is high. Hence, in this example, oil stocks are relatively attractive for investments for workers in the car industry.

The second story is true. The negative correlation between returns and shocks to the value of risky human capital for many workers is high. This is puzzling because it defies easy explanation in terms of asset pricing.

Consider a young person who anticipates uncertain future wage and equity income. An important fact in this situation is that wage risk is a major force of wealth for most young people. Another important fact is that equity returns are positively correlated with aggregate consumption and wages, but not highly so. Given this fact, the worker's choices of aggregate equity returns and aggregate wages, the high return on equities seems attractive for investments for the average young worker. That is, equities appear to offer attractive risk-return relationship for many young workers. On both counts, it seems the average young worker should hold a large equity portfolio. Collectively, they would drive up the price of equities, lower the real rate of returns on equity. This doesn't happen.

Ideally, young workers would like to smooth lifetime consumption by borrowing against future wage income, consuming a part of the loan and investing the rest in equity. In practice, most young people are effectively shut out of equity markets by the high cost of borrowing against future wage income. Therefore, they choose bonds over equity. Equity is a high demand for equities. But, if this analysis were correct, then millions of young people would hold large equity portfolios. Collectively, they would drive up the price of equities, lower the real rate of returns on equity. This doesn't happen.

As a result, what is attractive investments for the average young worker. That is, equities appear to offer attractive risk-return relationship for many young workers. On both counts, it seems the average young worker should hold a large equity portfolio. Collectively, they would drive up the price of equities, lower the real rate of returns on equity. This doesn't happen.

Ideally, young workers would like to smooth lifetime consumption by borrowing against future wage income, consuming a part of the loan and investing the rest in equity. In practice, most young people are effectively shut out of equity markets by the high cost of borrowing against future wage income. Therefore, they choose bonds over equity. Equity is a high demand for equities. But, if this analysis were correct, then millions of young people would hold large equity portfolios. Collectively, they would drive up the price of equities, lower the real rate of returns on equity. This doesn't happen.

As a result, what is attractive investments for the average young worker. That is, equities appear to offer attractive risk-return relationship for many young workers. On both counts, it seems the average young worker should hold a large equity portfolio. Collectively, they would drive up the price of equities, lower the real rate of returns on equity. This doesn't happen.

Ideally, young workers would like to smooth lifetime consumption by borrowing against future wage income, consuming a part of the loan and investing the rest in equity. In practice, most young people are effectively shut out of equity markets by the high cost of borrowing against future wage income. Therefore, they choose bonds over equity. Equity is a high demand for equities. But, if this analysis were correct, then millions of young people would hold large equity portfolios. Collectively, they would drive up the price of equities, lower the real rate of returns on equity. This doesn't happen.

As a result, what is attractive investments for the average young worker. That is, equities appear to offer attractive risk-return relationship for many young workers. On both counts, it seems the average young worker should hold a large equity portfolio. Collectively, they would drive up the price of equities, lower the real rate of returns on equity. This doesn't happen.

Further reading


Davids, S., and J.L. Winkler, P.

Further reading

Cowan, S., and J.L. Winkler, P.

Davids, S., and J.L. Winkler, P.

Further reading

Cowan, S., and J.L. Winkler, P.

Davids, S., and J.L. Winkler, P.

Further reading

Cowan, S., and J.L. Winkler, P.

Davids, S., and J.L. Winkler, P.

Further reading

Cowan, S., and J.L. Winkler, P.

Davids, S., and J.L. Winkler, P.

Further reading

Cowan, S., and J.L. Winkler, P.

Davids, S., and J.L. Winkler, P.

Further reading

Cowan, S., and J.L. Winkler, P.

Davids, S., and J.L. Winkler, P.

Further reading

Cowan, S., and J.L. Winkler, P.

Davids, S., and J.L. Winkler, P.

Further reading

Cowan, S., and J.L. Winkler, P.

Davids, S., and J.L. Winkler, P.

Further reading

Cowan, S., and J.L. Winkler, P.

Davids, S., and J.L. Winkler, P.

Further reading

Cowan, S., and J.L. Winkler, P.

Davids, S., and J.L. Winkler, P.

Further reading

Cowan, S., and J.L. Winkler, P.

Davids, S., and J.L. Winkler, P.

Further reading

Cowan, S., and J.L. Winkler, P.

Davids, S., and J.L. Winkler, P.

Further reading

Cowan, S., and J.L. Winkler, P.