RETURN TO TENURE: CONCEPTUAL AND EMPIRICAL ISSUES

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INTRODUCTION

Human capital has seldom, if ever, been accorded so central a role in public policy discussion, in areas ranging from international competitiveness and free trade to plant conversion in defense industries. Underlying this focus is a concern that structural changes in the economy will entail a dislocation of much human capital. Estimates of specific human capital and the return to the individual for remaining with one firm (the return to tenure) take on added significance in this context. This paper points out that standard empirical methodologies may underestimate the importance of such specific human capital.

Becker’s [1962] seminal human capital article drew attention to the polar cases of general and specific human capital. While Becker himself [1962, 17] recognized that “much on-the-job training is neither completely specific nor completely general...,” intermediate cases—one of which we will refer to here as quasi-specific human capital—have received relatively little attention.

In the simplest intermediate case, all alternative employers value the productivity increases associated with human capital identically, with the valuation falling between that for fully general and fully specific human capital. One reason that intermediate cases have received relatively little attention is that, in an important way, this simplest intermediate case is identical to an environment characterized solely by a mix of purely general and purely specific human capital. In particular, in both the simplest intermediate case and the case characterized by a mix of purely general and purely specific human capital, the amount of human capital lost by workers who move is the same as the amount of human capital which is specific for similar workers who decide to stay. Since the value of a worker’s human capital does not vary across alternative employers, the amount of human capital which would be lost in a move is uncorrelated with whether, in fact, the worker moves.
In reality, however, the increase in productivity associated with human capital often does vary across alternative employers. This paper focuses on a form of human capital—what we call quasi-specific—which captures this idea. In particular, we consider environments in which the value that alternative employers place on human capital is high for some firms and low for others. Job search thus becomes relevant because a worker might not, in any specific period, receive an offer from a firm that places a high value on the worker’s accumulated human capital.

As opposed to the case in which the increased productivity associated with human capital does not vary across alternative employers (the case discussed above), this case, in which human capital is quasi-specific, does not closely resemble an environment characterized solely by a mix of general and specific human capital. In particular, when there is quasi-specific human capital, a worker who switches employers will be, on average, a worker who received a wage offer from a firm that attached a high value to the human capital the worker had already accumulated.

Thus, in the case of quasi-specific human capital, the amount of human capital lost by workers who move is less than the amount of human capital which is specific for similar workers who decide to stay.

The concept of quasi-specific human capital is useful for a number of reasons. It explains job transitions which cannot easily be explained by recourse to general, firm or industry-specific human capital. Relatively, it can be seen as the human capital "building block" behind Sicherman and Galar’s [1980] theory of career mobility. It also has important implications for empirical studies of returns to tenure, and, in particular, for our understanding of plant closings and large-scale worker dislocations. Studies of returns to tenure that are not based on data drawn from large-scale worker dislocations provide biased estimates of such concepts as the amount of human capital at risk from a prospective plant closing. More generally, in a world in which job search is a relevant aspect of labor markets, the presence of quasi-specific human capital has interesting methodological implications for both returns to tenure and the extent to which human capital accumulation is specific. Because the amount of human capital lost by workers who move is less than the amount which is specific for similar workers who stay, there is a downward bias in estimates of the return to tenure, according less importance to specific human capital than is warranted.

To see the usefulness of the concept of quasi-specific human capital, consider Lou Gerstner’s move from being the CEO of RJR Nabisco to being the CEO of IBM. IBM offered Mr. Gerstner a lucrative package to move, notwithstanding the fact that he had no IBM or industry-specific experience, because the human capital he had accumulated elsewhere was central to what IBM needed in a chief executive. To quote James Burke, who led IBM’s search:

What I didn’t understand as much as I should have, and what IBM didn’t understand enough, was the rate of change in this industry. I don’t think any of us understood the impact of that, and how much smaller, entrepreneurial companies can exploit that rapid pace of change. They move quickly and they love to take risk. And I see those qualities in Lou. [NY Times, 27 March 1993, 1]
THE LITERATURE

The 1960s saw a number of theoretical papers on human capital [Becker, 1962; Oi, 1962; Ben-Porath, 1967]. Becker's seminal paper was the first to explore differences between specific and general human capital, where the focus was on the implications of human capital for the slope of age-earnings profiles. Oi saw labor as a quasi-fixed factor, with "the degree of fixity" being an important determinant of turnover rates, employment shifts and unemployment rates. Ben-Porath explored the individual's decision problem in investing in human capital over the life cycle.

More recently Parsons [1972], Hashimoto and Yu [1986], and Hashimoto [1981] have focused on the fact that workers and firms invariably share the investment in specific human capital. Parsons considers the extent to which specific human capital can serve as an explanation for quit and layoff behavior and wage rates. Hashimoto and Yu explore contractual possibilities designed to minimize allocative losses arising from wage rigidity, finding that both an appropriate division of the quasi-rent from specific human capital and efficient dismissal arrangements can ameliorate these losses. Hashimoto explores the precise nature of the optimal sharing arrangement, finding that the answer depends on the transaction costs involved in determining and reaching agreement on worker productivities.

Early empirical evidence overwhelmingly supported a strong positive relationship between tenure and wage rates [Mincer, 1974; Mincer and Jovanovic, 1981; Bartel and Borjas, 1981]. More recently, a different perspective has developed. Papers by Topel [1986], Abraham and Farber [1987], Atkeson and Shakkotai [1997], and Marshall and Zarkin [1997] have found that after more carefully controlling for biases that arise due to factors such as unobserved heterogeneity and job matching, much of the positive relationship between tenure and wage rates disappears.

In response to these more recent papers, Topel [1991] has made a very careful attempt to account for the (typically unobserved) process by which individuals arrive "at the combination of wages, job tenure, and experience...observed in survey data." In doing this he finds that returns to tenure are significant, an important contribution in light of the papers, mentioned above, that found weak relationships among tenure and wage rates. Topel's perspective is similar to ours, in the sense that both papers argue that standard empirical methodologies produce estimates of the returns to tenure that underestimate the importance of specific human capital. However, as is discussed in more detail below, the papers are different, because Topel's framework does not capture our idea that workers are searching for good matches with their human capital investments. Topel focuses, rather, on the implications for the job matching process of innate characteristics of workers and jobs such as worker ability and the "durability" of different kinds of jobs.

We view our argument as complementary to, but different from, Topel's. In particular, both incorporate a selection problem, which arises when workers switch employers. However, whereas switching is associated with job match improvements in the Topel argument, we argue switching occurs when, on average, workers need to sacrifice relatively small amounts of human capital. Not only is there a clear conceptual distinction between our approach and Topel's, there is also a difference in their empirical predictions. In a Topel-type world the return to tenure in the data, when properly measured, will not depend on the experience levels of the workers in the sample. In contrast, as discussed later in more detail, our approach predicts that the return to tenure in the data will be negatively correlated with the experience levels of the workers in the sample.

Finally, we turn to the recent study of Jacobson et al. [1993] which investigates earnings losses from job displacement. When human capital is quasi-specific, the likelihood of finding a good match for one's accumulated human capital will be higher when there are fewer similar workers searching for a job. Thus, in an environment characterized by quasi-specific human capital, earnings losses due to job displacement should depend on both the local labor market conditions and the number of workers who are displaced. Jacobson et al. find evidence that exactly matches these predictions. That is, they find that losses due to displacement are higher when local labor market conditions are poor, and that workers in their "mass-layoff" sample do significantly worse than the workers in their "non-mass-layoff" sample.

A STYLIZED EXAMPLE

In this section we consider an example that builds on the earlier discussion. In this example the search component, so central to our argument, is introduced explicitly.

Assume there are N workers who live for two periods. In period 1 each worker produces x units of output and acquires some human capital, which enables her to produce x+λ in the second period if she remains with her first-period employer. At other potential employers this worker's second period output can take on either of two values, x+λ if or x+λ with probability 1-p. Workers receiving an x+λ outside offer switch employers, while those receiving an x+λ outside offer remain with their first-period employer at the wage x+λ.

We are now in a position to demonstrate clearly why the return to tenure in the data will likely underestimate the importance of specific human capital in environments characterized by quasi-specific human capital. Consider the results of a regression of wages on both tenure and experience using data generated by this example. The coefficient on experience would capture the return to having one year of experience and switching employers, while the coefficient on tenure would capture the return to remaining with one's initial employer for the second period, net of the return to experience. The coefficient on experience would thus equal λ (the difference between a worker's first and second period wages when the worker switches employers), while the coefficient on tenure would equal δ-λ, which is negative. The coefficient on tenure does not, however, accurately measure the average amount of specific human capital in the environment. The average amount of specific human capital equals δ=[(x+λ/(1-p))]-λ, which is strictly greater than the measured return to tenure.
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The logic behind the above result is this. Data on which estimates of the return to tenure are based do not typically include the best outside offers received by workers who don't switch jobs. Because of this, standard empirical approaches such as the one used above estimate the return to tenure by measuring how much human capital is lost when workers actually switch employers. This, however, creates a problem in a world characterized by quasi-specific human capital. That is, since in a world of quasi-specific human capital workers only accept an offer to move when not much human capital needs to be sacrificed, standard empirical approaches will produce estimates of returns to tenure that underestimate the importance of specific human capital in the environment.

We have also considered what happens in the above framework when there are more periods and job matching [Novos and Waldman, 1995]. Not only does the return to tenure underestimate the importance of specific human capital, but additionally this return is typically negatively related to experience. The explanation is that, because of a positive correlation between the total holding of human capital and experience, as a worker's experience increases she will only move when this entails losing a very small proportion of her human capital. The result is that as experience increases, a higher proportion of the incremental productivity associated with human capital is captured by the return to experience rather than the return to tenure.

There are a number of ways this prediction could be tested. For example, it could be tested by looking at returns to tenure across different experience cohorts, or it could be tested in a single regression by interacting the tenure variable with an experience variable. Brown [1989] contains results consistent with the prediction. In a study of the return to tenure that uses survey responses to measure productivity, Brown interacted the tenure variable with an experience variable and finds a statistically significant negative coefficient.

DISCUSSION

The previous section focused on the implications of quasi-specific human capital for interpreting measured returns to tenure. Here we consider its implications for age-earnings profiles, and for industry- and occupation-specific human capital.

Age-earnings profiles are generally thought to be upward sloping for two reasons: i) human capital accumulation and ii) improvement in worker-firm matching with experience. A number of papers have attempted to explore the relative importance of the two explanations by directly estimating how much wage growth can be attributed to human capital accumulation and how much to job matching. Topel [1986, 227], for example, finds that "the matching process accounts for 25 percent or more of the observed relationship between earnings and labor market experience." What does the perspective on quasi-specific human capital introduced in this paper suggest about the reliability of such estimates?

Our first comment is that the whole endeavor lacks a theoretical underpinning. From our perspective, a worker who searches for a new job is not only searching for a good match for her innate characteristics, but also a good match for the human capi-

tal she has already accumulated. Therefore, decomposition of the type described above has no firm theoretical basis because the total returns to human capital accumulation will depend on the success of the worker's search.

Ignoring these theoretical problems, however, is it that current estimates of the returns to job matching capture? Suppose that, as in the stylized example, quasi-specific human capital can sometimes be worth more at a new firm than at the firm where it was originally accumulated.* If so, current estimates of the returns to job matching are likely to be overstating the returns due to improvements in the match between firms and the innate characteristics of workers. Under existing theory a worker's wage can rise during a move only because the worker has found a better match for the worker's innate characteristics. Given quasi-specific human capital, however, such a wage increase will also frequently occur because the worker has found a better match for the worker's human capital. Therefore, because current attempts at decomposition are based on existing theories, wage increases due to better matching of human capital are attributed instead to better matching for innate characteristics.

Finally, our perspective is also relevant to the cases of industry and occupation-specific human capital. The first question is, in an environment characterized by industry and/or occupation-specific human capital, is the human capital a type of quasi-specific human capital? The answer depends on the probability that workers switch industries or occupations. In particular, if the probability that a worker will leave an industry or occupation is zero, the worker's industry- and occupation-specific human capital should be thought of as general. In contrast, when this probability is greater than zero and search is an integral part of the job environment, industry- and occupation-specific human capital are types of quasi-specific human capital and the ideas discussed earlier are relevant.

A related issue arises in the recent study of Neal [1996]. He examines the case of industry-specific human capital, and finds results consistent with no truly industry-specific human capital but rather human capital that is quasi-specific:

I must acknowledge the possibility that the results outlined above reflect the importance of skills that are not truly specific to given industries, but rather specific to a set of jobs that are associated with the interaction of certain occupations and industries... Future research in this area must confront the task of defining job categories that capture important skill specificities. [Neal, 1996, 669-70]

We would argue in fact that there is a growing trend away from skill development that can be categorized as strictly either industry or occupation-specific — witness the growing importance of computer literacy across a broad range of jobs and industries. To the extent that this is the case, quasi-specific human capital is becoming a more and more important element of the human capital accumulation process.
CONCLUSION

Economists such as Gary Becker have long recognized that human capital often resists categorization as either all general or all specific. However, little if any attention has been given to exploring the implications of alternative descriptions of the human capital accumulation process. This paper has done so for one alternative — termed quasi-specific human capital — in the context of a labor market search model. The main result is that if the presence of quasi-specific human capital estimated returns to tenure may significantly understate the importance of specific human capital. Implications of this were explored for a number of issues of relevance to policymakers.

The ideas presented here offer interesting avenues for future research. In particular, a set of recent papers has explored firm behavior in the context of asymmetric learning in labor markets (Waldman, 1984; 1990; Greenwald, 1986; Bernhardt and Soones, 1993; Novos, 1995), a factor which Gibbons and Katz (1991) have found to be of empirical significance. In the context considered here this would mean that current employers have better information about the type and magnitude of a worker's accumulated human capital. In future work we plan to explore models that incorporate both quasi-specific human capital and the type of asymmetric learning considered in these earlier papers.

NOTES

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1. We are indebted to an anonymous referee for pointing this out to us.

2. One might ask what the relationship is between quasi-specific human capital and industry- or occupation-specific human capital. Industry- or occupation-specific human capital is general human capital — human capital that all workers in a particular industry or occupation have. If the probability of such a capital move is greater than zero, however, then industry- or occupation-specific human capital should be regarded as quasi-specific. This issue is discussed in more detail later.

3. See also the related argument in Topel (1986).

4. Durability here refers to the average duration a worker is on a job before transferring either to unemployment or a different job.

5. One might think that an alternative explanation for Jacobsen et al.'s findings is simply that the post-deployment disemployment wage is determined by supply/demand conditions at the date of the disemployment. However, Jacobsen et al. also find that when labor market conditions are favorable, the disemployment wage is lower. The line of reasoning presented above, however, would suggest that if the disemployment wage is determined by supply/demand conditions at the date of the disemployment, the disemployment wage would be lower before loose labor market conditions.

6. Sickles and Galor's theory of occupational mobility would seem to be based on this idea. Len Garbany's move from RJR Nabisco to IBM also captures this notion, as our earlier discussion indicated.

REFERENCES


