Distinguished Fellow
Mincering Labor Economics

Sherwin Rosen

J acob Mincer has helped set the research agenda and professional style in labor economics for over 30 years. He has been a pioneer in using micro-economic ideas to analyze empirical problems of great importance, and along with Gregg Lewis, Gary Becker, and a few others, has transformed labor economics into one of the most fruitful areas of applied economics. The wedding of data and theory has been paramount in his work, which is a most uncommon blend of insightful data analysis guided by strong conceptual foundations and a thoroughly economic point of view.

Before Mincer and the others got into it, American labor economics was far outside the mainstream of economics. There were exceptions, to be sure, but much work in the field used ad hoc institutional ideas and case study empirical methods. It has been said that even some of the best economists in those days called off their bets when it came to labor: models based on nonrational behavior were not acceptable in any other market, and rational models were scarcely respectable in the labor market. The unavailability of systematic data sources, the legacy of unemployment from the Great Depression, and the rise of trade unioinism probably share responsibility for that state of affairs. In any case, Mincer was one of the first to use relatively simple and empirically tractable economic ideas that could be applied more systematically than case studies to illuminate labor market behavior. Furthermore, his work has been closely tied to the development and availability of micro data and Census and other survey sources, for which his professional style and methods are well matched.

Mincer's work has survived intensive scrutiny and refinement over the years. It has also contributed to attracting a talented group of empirical

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economists and econometricians into the field. However, his work does not follow the deep structural econometric approach that has been pursued so vigorously in the past two decades. Rather, it is a less formal blend of theory and data; less demanding on the precise information contained in a specific data source than the structural approach requires, but more demanding in searching for different manifestations of the same idea in various contexts. Professional fashions in such matters shift from time to time, but Mincer's approach probably represents an increasing share of current empirical work in the labor field.

Mincer made important contributions to two problems that dominated labor economics research during the 1960s and 1970s. His research helped uncover the empirical content of human capital theory, where he used those ideas to study the determinants of earnings and the sources and nature of earnings inequality. That work codified the method by which earnings are studied in virtually every country in the world today, and without which much of modern labor economics would hardly exist. He was also a pioneer in studying labor force participation decisions of married women. He embedded his analysis of labor supply in the family context, which for married women required close attention to the effects of the presence and ages of children, but what truly differentiated his work from previous studies was to examine the interrelationships between the market opportunities of spouses.

Mincer's approach was propelled by public policy interests in child welfare programs and mothers' work decisions, and it stimulated a large volume of empirical research on the determinants of labor supply. It has provided a basis for economic understanding of the enormous growth in labor force participation of women in the twentieth century, and for some of the human capital sources of market wage differentials between men and women. For the past decade, Jacob has set his characteristic stamp on the empirical study of job mobility, one of the main problems that occupied labor economists in the 1980s. This work is notable in its empirical linkage to the key concepts of general and firm-specific human capital investments, which play important roles in understanding how enduring employment relationships are formed over the work-life cycle.

Human Capital

Jacob Mincer's entry into economics was delayed by being born in the wrong place at the wrong time: Poland in the 1920s. However, he made up for the late start by coming on-line as a major research economist with remarkable rapidity. It is sometimes claimed that many talented young economists today are dissuaded from entering empirical and applied fields because it takes ten years or so to learn the trade and develop the skills and intellectual maturity required to do convincing work. If true in general (which I doubt), there are many exceptions, and Jacob is one of them. His research style and approach

Table 1

Works by Jacob Mincer Referenced in This Article

(*in chronological order*)

1. "Investment in Human Capital and Personal Income Distribution," *Journal of Political Economy*, August 1958, *66*, 281–302.
2. "Labor Force Participation of Married Women." In *Aspects of Labor Economics*. New York: National Bureau of Economic Research, 1962, 63–97.
3. "On-the-Job Training: Costs, Returns and Some Implications," *Journal of Political Economy*, October 1962, *70* (supplement), 50–79.
4. "Market Prices, Opportunity Costs and Income Effects." In Christ, Carl, ed., *Measurement in Economics*. Stanford: Stanford University Press, 1963, 67–82.
5. "Labor Force Participation and Unemployment: A Review of the Evidence." In Gordon, R. A. and M. S. Gordon, eds., *Prosperity and Unemployment*. Berkeley: University of California, 1966, 73–112.
6. "The Distribution of Labor Incomes: A Survey," *Journal of Economic Literature*, March 1970, *8*:1, 1–26.
7. "Family Investments in Human Capital: Earnings of Women," with Solomon Polachek, *Journal of Political Economy*, Part II, March-April 1974, *82*:2, S76–S108.
8. *Schooling, Experience and Earnings*. New York: Columbia University Press for the National Bureau of Economic Research, 1974.
9. "Labor Mobility and Wages," with Boyan Jovanovic. In Rosen, Sherwin, ed., *Studies in Labor Markets*. Chicago: University of Chicago Press, 1981, 21–63.
10. "Wage Changes in Job Changes." In Ehrenberg, Ronald, ed., *Research in Labor Economics*, Vol. 8. Greenwich: JAI Press, 1986, 171–97.
11. "Job Training, Wage Growth and Labor Turnover," unpublished. New York: National Bureau of Economic Research, 1988.

were already set in his Columbia Ph.D. thesis, published in the 1958 *Journal of Political Economy* [1].

The simple idea behind this work has links to Adam Smith's discussion about how the costs of training for a profession affect its average earnings, and to Friedman and Kuznets' (1947) empirical study of earnings in the professions. High earnings are required to compensate for the costs of entry, as an equalizing difference. Mincer generalized that idea to connect the modern theory of human capital to survey data on earnings, and to apply it to the broader study of earnings inequality. The key step was to abandon thinking about hundreds of specific professions and occupations. Instead, human capital investment was simply measured by school years attained in survey data, which is nicely ordered and comparable across the whole labor force: it is a much more general classification.

The value of additional schooling can be thought of as the expected present value of future earnings to which it gives rise. In contemplating a decision to continue schooling, account must be taken of delays in the receipt of earnings—the income opportunities foregone—from postponing labor market entry. These delays inevitably have large effects on human wealth, because they occur at the beginning of working life, when the effects of discounting for interest are large, and these cost effects persist throughout working life.

If all students have the same tastes, faced the same choice of jobs, and began with equal endowments, all would choose the same level of schooling. However, if different jobs require different schooling investments, then earnings must equalize the foregone opportunity costs of schooling. It follows that the supply of workers to each schooling level is infinitely elastic at the wage which compensates for years of schooling undertaken. Demand affects the number of people who choose each job, but not the wages they are paid.

This framework leads to semi-log regressions like this:[1]

$$(1) \qquad \qquad \log y = \log y_0 + rS$$

Equation (1) is about half of a "Mincer earnings equation." We will get to the other half presently. For now think of it as a cross-section regression (over persons) of the log of earnings on years of school completed. Then the constant term represents the log of the equivalent annuitized income of initial human capital value. The regression coefficient on schooling measures the rate of interest, or equivalently (from the first order condition), the marginal internal rate of return on schooling investments. The 1958 paper [I] used this model to help explain why earnings distributions are skewed right, arguing that log earnings are the natural supply price rather than earnings itself. For instance, annual earnings would tend to be log normally distributed if schooling were normally distributed.

Extensive work has gone into investigating other reasons that people might decide to complete school, or not. Two obvious choices have been student ability and family resources; the first might affect the marginal value of schooling and the second might constrain its financing (see especially Becker, 1967). These factors require a more complex model, because they imply that earnings differences cannot be completely explained by costs of education alone. Nonetheless, augmenting equation (1) with ability measures and using more complex statistical models has not much affected regression estimates of rates of return to education. As an empirical matter, "ability bias" is small.

Furthermore, equation (1) helps in thinking about life-cycle aspects of economic inequality. The true distribution of human wealth may bear little relationship to measured earnings inequality in cross-section data. For instance, in the pure model where wages fully equalize for the costs of schooling there is no inequality in wealth, even though there is much inequality in earnings. Adjusting the earnings distribution to remove the wealth-equalizing aspects of different schooling choices has proven to be a nontrivial task. However,

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[1]The straightforward model behind this framework runs as follows: Let $y(S)$ represent average annual career earnings if a person chooses to remain in school for S years and let r be the rate of interest. If $W(S)$ is human capital wealth associated with the schooling decision point, then, approximately, $W(S) = e^{-rS} y(S)/r$. Choosing S to maximize $W(S)$ results in the Austrian harvesting condition $d \log y(S)/dS = r$. Market equilibrium supply of workers by school years implies $W(S) = W_0$, for all S, where W_0 is a constant. It follows that $y(S) = (rW_0)e^{rS}$, from which (1) follows.

Jacob Mincer

adjusting differences in earnings to remove the systematic effects of experience is less controversial and has been shown to significantly reduce cross-section earnings-based measures of inequality (Paglin, 1975).

In his 1974 book, *Schooling, Experience and Earnings*, Mincer [8] developed the fuller life–cycle implications of human capital theory for earnings. Earlier, in [3], he had used Becker's (1962, 1964) human capital accounting framework to partition estimated human capital values into formal schooling and on-the-job training components, basing the estimates on data grouped by education, age and sex from the decennial Census.[2] The 1974 book changed the orientation to individual earnings data derived from such records. This work also uses Becker's (1962) analysis to introduce life-cycle variations in earnings into the regression equation (1) and extends Becker and Chiswick's (1966) earlier analysis of earnings inequality in important ways [6]. Two important empirical innovations resulted from it.

The empirical nature of variation in earnings over the life cycle—the generally increasing, but concave shape of the path of earnings with age—was well-known prior to Mincer's work. It was called the "age-earnings profile." Mincer changed the emphasis from age to labor market experience. Interpreting on-the-job training broadly to include learning by experience as well as explicit participation in training programs, job investment is better indexed by market exposure than by age. Mincer estimated experience as age minus schooling minus six (the age at which school begins), and this has become

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[2]The 1962 special issue of the *Journal of Political Economy* was a landmark in labor economics. In addition to the important papers by Becker and Mincer, Stigler's paper on information in the job market appears there, as well as several other excellent papers extending human capital ideas to migration and health. *Aspects of Labor Economics*, an NBER book also published in 1962, is another landmark containing Mincer's paper on female labor supply. The book was edited by H. Gregg Lewis, but (not uncharacteristically) his name does not appear on it.

widely used in all subsequent research on earnings (for males). This seemingly small change from age to experience has had large consequences. It led to the empirical partitioning of experience between firm-specific and general to reflect Becker's theoretical decomposition of investment into firm-specific and general components. That distinction is essential for studying job turnover and wage differences between men and women.

The second innovation was to arrive at a specific quadratic functional form for the experience terms in a generalization of equation (1),

$$(2) \qquad \log y = \log y_0 + rS + \beta_1 X + \beta_2 X^2,$$

where X is experience. Equation (2) was arrived at by imposing functional form restrictions on human capital investments made over the life cycle. Theory implies that the return to on-the-job investments falls over working life, as the period over which they can be used becomes shorter. And the opportunity costs of investment increase over working life as a person's wage increases and opportunity costs of time become more valuable. After experimenting with several alternative formulations, Mincer settled on a function in which invest-ment is proportional to earning capacity, with the proportion linearly declining in market experience. This led to equation (2).

A fair bit of subsequent effort has been put into verifying equation (2), and comparing it to alternate specifications. It has held up quite well, though there are recent signs that higher order polynomials in experience are necessary to fit the 1980s data. Some effort also was devoted to finding simple structural human capital cost and returns functions that could generate the equation as a solution to a thorough-going intertemporal, life cycle optimization problem. However, there is a sense in which such efforts are beside the point, because the labor economics community has adopted specification (2) as its "standard" earnings function. It has become an almost universal reference. I recall attend-ing a conference on human capital in England several years ago, where one of the participants stated that he had "Mincered the data." By this he meant that equation (2) and variants of it had been fit to the data at his disposal. The short-hand term has proven to be entirely appropriate. It is virtually a "rite of passage" for every young labor economist to have "Mincered" some data or other.

That story is meant as mild amusement, but it has a very serious and scientifically important side. Equations of the form of (2) have been fit on every earnings data source available for various time periods throughout the world. It is seldom the case in economics that we see replication of the same ideas and, more importantly, the accumulation of empirical results bearing on a specific problem on this scale. I can think of only a few examples in other branches of economics. These estimates serve as an important standard of comparison for new work. Estimated earnings functions are now known to have important similarities in developed economies and in undeveloped ones. I once

"Mincered" some Panamanian data and, apart from scale, was surprised to find remarkable similarities with U.S. data. Reporting those results to an AEA session of development economists caused no surprise whatsoever. Everyone knew what I would find, because all of them had found more-or-less the same thing in the countries in which they specialized. This relative uniformity of findings deserves greater study, documentation, and explanation than it has been given so far.[3]

Labor Supply

The other area where Mincer deeply set his mark is the economics of female labor supply, presented particularly in the 1962 and 1963 papers [2, 3, 4]. Well before that work was done, an influential article by Robbins (1930) had pointed out the virtues of constrained optimization and consumer theory as a way of studying labor supply behavior. However, the standard neoclassical model was not well-integrated with micro data until Mincer came along. For instance, Long (1958) had examined the effects of fertility and schooling on labor force participation decisions of married women, but did not attempt to estimate separate income and substitution effects of wages. Jacob was the first to investigate systematically the empirical effects of market wage opportunities of spouses on the labor supply decisions of married women, and to estimate both income and substitution effects inferred from the effects of wages and other family income on participation probabilities.

Empirical study of the labor supply decisions of married women offered a considerable challenge for any economic model. Women were working more, while men were working less. Moreover, time-series and cross-section data for women appeared to be inconsistent with each other: the trend in female labor force participation was rising in 1920–1960 aggregate time series, as income for women increased; but in cross-sections, women married to spouses with large earnings were less likely to work. Robbins had used the contrasting directions of income and substitution effects in the neoclassical model to account for the downward trend in the labor supply of men. Decreasing work hours and increasing wage rates over time meant that the negative income effects of wage changes dominated the positive substitution effect. Evidently this did not hold true for women, because their market work effort was rising over time.

[3]The 1974 book also developed an argument for how returns to alternative amounts of on-the-job training might affect wages, analogous to the schooling argument described above. This led to an empirical concept labeled "overtaking"—roughly the years of experience at which foregone earnings from on-the-job investments grew to equality with initial earnings capacity. This concept has not been adopted nearly so widely as the basic Mincer earnings function. For the interested reader, surveys by Willis (1986) and myself (1977) may be helpful in delimiting the broader context of human capital research and providing details on many points that cannot be developed here.

Declining fertility helped to explain the different trends between men and women, but it didn't go far enough.

Mincer estimated both effects in cross-section data for married women. He found, by comparing women in different circumstances and in different geographic labor markets at a point in time, that the substitution effect dominated the income effect. This provided an additional basis for reconciling the time-series and cross-section data. The estimates were obtained with grouped data across standard metropolitan areas. Married women's participation rates were regressed on the average income of husbands, an index of the female wage, and additional controls for fertility, education, the unemployment rate, and age. The regression coefficient on spouse's earnings was interpreted as an estimate of the income effect for women, and was used with the estimated direct wage coefficient to infer the large substitution effect. The large substitution effect found for women reconciled different time-series behavior for men and women: equal growth in wages of both men and women would imply increasing labor force participation of married women over time. However, in cross-sections the correlation between husband's income and the wife's wage was much smaller than in aggregate time-series. Taken together, fertility and wage growth could account for about half of the decade-to-decade changes in female labor force participation from the 1920s through 1960. The peculiarities of the Great Depression and of temporarily large female labor force participation during World War II remained as reasonable extraneous factors that were necessary to round out the picture.

The success of this study contributed to an enormous empirical enterprise of labor supply research. Public interest in poverty, manifest in New Frontier and Great Society programs and negative income tax experiments, provided the research support necessary to maintain professional interest in this class of problems up to the present day. Much progress in the conceptual, technical and estimation aspects of labor supply research has been made over the years, and several innovations that have value in other branches of economics have resulted from it.[4]

Mincer's basic ideas remain in use for studying the labor supply of women, but with an improved specification that separates the all-or-nothing labor participation kind of decision from choice of working hours given that the decision has been made to participate. It is now known that there are essentially no income effects at the extensive, participation margin for women (Lewis, 1969; Ben Porath, 1971). This reinforces Mincer's original finding that the effect of wages on women's labor supply would be dominated by substitution terms. In fact, estimated elasticities of response to wage rates are much larger for the participation rate than for hours of work. Even so, this model, or any other one that has been developed, does not fare so well in explaining

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[4] This research on labor supply cannot be reviewed here. But see Pencavel (1986) and Killingsworth and Heckman (1986) for excellent surveys on the subject. Cain (1982), from which I have liberally drawn, surveys developments in which Mincer's work played an especially important role.

subsequent growth in women's labor force participation after 1960. The qualitative prediction of continued growth has held up because women's wages have at least kept pace with men's wages over the 1960–90 period. But labor force participation of women increased greatly during the 1970s, when wages were stagnant or declining. The continued decline in fertility works in the right direction for post-1960 developments, but changes in divorce, the structure of families, and the social and legal climate regarding work by women must be considered for a full account of these changes. Disentangling these factors has proven a difficult task.

Another aspect of Mincer's labor supply research warrants discussion. Recent work has considered fully intertemporal life-cycle models of labor supply, often with interactions in consumption and labor allocations. Mincer studied some dynamic aspects of labor supply, but in a looser fashion. In his 1962 paper [2] and even more so in a subsequent 1966 paper [5], he followed the "permanent-transitory" approach to time-series dynamics which had become SOP in the 1960s, upon Milton Friedman's success with using the approach for consumption. Jacob was among the first to apply a price-theoretic model to the "added and discouraged worker hypotheses." Fluctuations in labor supply of secondary workers could be described in terms of income and substitution responses to transitory shocks over the business cycle.

The idea that poor market conditions would reduce family incomes and tend to attract secondary workers temporarily into the labor market is a kind of income effect. It would be called a "liquidity constraint" in recent intertemporal labor supply theory. But poor labor market prospects for "primary" earners would also tend to reduce the return to job search and discourage "secondary" workers from entering if more valuable nonmarket alternatives were available to them. This opportunistic substitution response to transitory disturbances is the essence of intertemporal substitution theory. Empirically, the discouraged worker (substitution) effect dominated the added worker (income) effect. However, Pencavel (1986) and Killingsworth and Heckman (1986) suggest that the discouraged worker effect has diminished in recent years, perhaps because of the firmer ("primary") life-time labor force commitments of women.

Following Mincer's lead, Cain (1966, 1967) pursued these ideas to good effect many years ago, but that line has not been followed much since that time. Given the analytical difficulties of specifying and estimating complete interactive models of labor supplies of various family members over business cycles, perhaps reexamination of these somewhat looser earlier empirical approaches to intertemporal substitution problems would be worthwhile.

Wage Differentials and Turnover

Mincer combined his human capital and female labor force participation interests in work on male-female wage differentials, done jointly with Solomon Polochek in 1974 [7]. It was well-known that the demands of household

production would reduce the incentives for women to invest in market-oriented human capital. Previous comparisons had documented substantial wage differences between men and women and regression analysis revealed that the growth of earnings with additional experience was also much smaller for women than for men. Mincer and Polochek were among the first to relate the economics systematically to the data. Their idea was that expected future labor force participation would influence the incentives for human capital investment: different commitments and expectations of future participation between market and nonmarket sectors could help to account for both empirical observations. Effectively, a person acquires additional human capital on the job by "selling off" some earning capacity to invest in human capital. The marginal cost of that additional human capital equals its discounted expected flow of future funds in equilibrium.[5]

Thus, incentives to acquire market-oriented human capital vary directly with the future utilization of these acquired skills. Rates at which market-oriented skills were utilized differed substantially between married men and married women in traditional households, following the typical division of labor in which men tended to specialize in market production and women tended to specialize in nonmarket production. These patterns were clearly established in studies of female labor force participation, where the presence of young children promoted labor force withdrawals of the mother. Married women had less incentive to invest in market human capital compared to men, which translated into less growth of labor market skills over worklife and to smaller total accumulations of market skills at any point. Both wage growth and average wage rates would be smaller for women.

Observed earnings patterns between men and women (cross-classified by marital status) provided the main evidence for their theory. They also included other controls (like education) and used two-stage least squares estimation to purge the effects of reverse causation—labor supply effects going from women's wages to labor force participation. This point remains controversial because discrimination would itself reduce women's investment decisions and make

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[5] In more rigorous language, let K be the amount of human capital embodied in the person, u the rate at which capital is utilized, R the unit rental price, δ the depreciation rate (assumed independent of utilization) and $C(I)$ the cost of purchasing I units of human capital, where $I = dK/dt - \delta K$. It follows that $y = RKu - C(I)$, where y is observed earnings. Further simplification, without substantial loss of content, is achieved if the time path of $u(t)$ is taken as exogenous and if $R(t)$ is constant over time. Then the definition of earnings implies that optimal investment solves the marginal condition

$$\int_{t}^{\infty} Ru(s)e^{-(r+\delta)(s-t)}\,ds = C'(I).$$

The left-hand side of the equation is the discounted expected flow of future returns from a unit of human capital. It represents the marginal return to a unit of investment. The right-hand side is the marginal cost of investment.

market work less attractive, and a firm basis for identifying causality has yet to be found (Gronau, 1988).

Perhaps the most convincing evidence in Mincer and Polachek's paper was the finding that earnings of women who had never married were very similar to earnings of never-married men over their working lives. If never-married women did not intend to marry, their labor force commitments would tend to be similar to those of men and their investment incentives would be the same. It is even possible to argue that the test is slightly biased against the hypothesis if some of the women who had never married nevertheless expected to marry at earlier stages of their lives: that would have reduced their expected returns from investment in those years and tended to decrease both the level and growth of their wages. A possible bias going in the other direction is that never-married men earn less than married men and may not be the appropriate comparison group.

Subsequent work on male-female earnings differences has focused on the statistical consequences of measurement errors in women's experience. Measuring women's experience as age minus schooling minus 6—as is done for men—can lead to large errors because it does not include the lengthy period of labor force withdrawal associated with raising children. This measurement error in itself tends to bias downward estimates of the extent to which women's earning rise with experience. And the effect is compounded by changing labor force participation expectations across cohorts of women. Changing the marital and fertility expectations of younger cohorts has changed their investment incentives compared to their older counterparts. Hence older women do not provide the proper basis for comparison with younger women in a wage equation (Blau and Ferber, 1986; Goldin, 1991).

Beginning in the late 1970s, Mincer turned his attention to a detailed examination of the sources of wage growth over working life and the relation between wage growth and job mobility. The development of true panel data sources and the introduction of panel elements through retrospective questions in cross-section surveys has made it possible to study questions of this kind in recent years. The importance of this research lies in its potential to provide evidence on the decomposition of human capital value into general market and firm-specific components. However, firm-worker matching and job shopping introduce additional complexities into the analysis of turnover as a conceptual matter, and the econometric complexities of panel data give rise to ambiguity in parcelling out causes of turnover and wage growth between heterogeneity among observably similar agents and life-cycle investment differences that evolve over time. These issues are not yet resolved; the recent discussion in Topel (1991) is a good place to start for those interested in pursuing these points further. Here, I concentrate instead on a sketch of Mincer's main contributions.

The most interesting thing about job mobility is its infrequency. Workers and firms remain attached to each other for remarkably long periods of time.

Furthermore, job mobility tends to be focused at early stages of the life cycle, with the hazard of job turnover sharply declining in job tenure. Most job turnover occurs within a year or two of the time of hire, so that if a job has persisted for two years, the chance that it will last for a very long time is very large. These observations clearly point to important causal roles for both job shopping/matching and firm-specific human capital accumulation. Furthermore, human capital theory predicts a strong interaction between incentives to invest in firm-specific skills and expected duration of the job. Mincer's influential 1981 paper with Jovanovic [9] investigates wage growth and job turnover as the joint result of these investment interactions. Wage growth is found to be inversely correlated with turnover. Steeper wage profiles associated with job-specific tenure after a successful match has been found are interpreted as the sharing of costs and returns of greater firm-specific human capital investment between workers and firms. These gains reduce incentives for quits and layoffs.

Subsequent findings [10, 11] that wage growth declines with age and long tenure are attributable to reduced investment payoffs as retirement approaches. The difficulty of finding new jobs among those who lose their jobs at older ages supports the importance of firm-specific investments in understanding life-cycle earnings. The 1962 paper [3] had detected complementarity between investments in formal schooling and on-the-job training. This gets translated to greater firm-specific human capital investments and results in smaller turnover and unemployment incidence among more highly educated workers. Direct evidence on participation in formal on-the-job training programs also shows inverse correlation with subsequent job turnover and positive correlation with wage growth.

Conclusion

This brief description is meant to convey some of the flavor of Jacob Mincer's work and why it has been so influential in labor economics. I would be remiss, however, in omitting reference to the unusual and extraordinary intellectual relationship between Jacob and Gary Becker when they were colleagues at Columbia in the 1960s. Though they did not explicitly collaborate on joint research, they worked in the same general areas. Their individual efforts were highly complementary and undoubtedly spurred each other to greater accomplishments. This superadditivity is especially apparent in Mincer's work on human capital subsequent to his thesis, which drew special inspiration from Becker's work on that subject, and in Becker's development of household economics, which paralleled Mincer's work on the labor supply of women and the value of time.

Their joint research workshop at Columbia attracted many of the best graduate students there at the time, most working on subjects closely related to their mentor's research. It has supplied more than its share of distinguished

senior people currently active in labor and allied fields. From my own participation in the workshop as a visitor one year, I recall a great sense of mission and commitment to the development of new ideas that were held by all participants, and a sense of getting in on the ground floor and the need to spread the word that sometimes occurs in the formative days of a new field. This extra dimension of complementarity with students—a workshop in the truest sense of the word—no doubt played its role in the subsequent development of the field. The intellectual sparks and excitement also attracted a host of young labor economists of my generation and younger to take part in these activities, as fellows at the old New York office of the National Bureau of Economic Research, where Mincer and Becker were affiliated, or in more permanent positions at Columbia and other universities in the area (especially CUNY). For me, participating in that environment was one of the most stimulating and interesting periods of my intellectual life.

Fortunately Mincer remains very active in research, in spite of having attained emeritus status at Columbia, where he taught for so many years. Today his interests run to investigating the empirical connections between human capital, technical change, and economic growth; and to partaking with wife Flora in the extraordinary varieties of musical performance available in New York. I doubt if we will soon hear Jacob play his violin to the general public, but I am sure he will have many more interesting things to say to labor economists about human capital and the participation of women in the labor market.

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