1 Overview

1.1 Motivation

This monograph is concerned with the analysis of human capital investment, employment and bargaining at the level of the firm. Much of the related seminal work in human capital theory has been carried out in terms of optimisation in the neoclassical firm with respect to the marginal worker. This includes the analysis of employment and other labour market implications of investments in general and specific human capital by Becker (1962) and Oi (1962) as well as Hashimoto's (1979) transaction cost model of rent sharing. The latter work points strongly to the importance of bargaining in the human capital investment decision. Despite the dominance of the 'marginal worker approach', the most convincing arguments as to the importance of human capital specificity derives from work that emphasises investment in a team of workers and the associated difficulty of a single worker being able to transfer group-related skills and know-how outside the firm (Oi, 1983; Aoki, 1984). The notion of bargaining over investment costs and returns combined with the view that investment is often undertaken with respect to work teams suggest quite strongly that union bargaining models may have much to offer in the development of the whole subject area.[1] Here, we attempt the first summary of results that incorporate both team investment and employment decisions on the bargaining agenda.

The book has three broad objectives. First, it seeks to provide an exposition of key labour market issues that stem from standard comparative static human capital theory of the neoclassical firm. These cover both employment decisions within the firm as well as unemployment repercussions arising from firms' turnover costs and specific human capital investments. Secondly, it explores the relevance of firm–worker and firm–union bargaining models to the study of human

capital investment and employment decisions. Among other features, work in this respect entails the concept of human capital as a team investment as well as the comparison of investment within both neoclassical and coalitional firms. Thirdly, and partly with an eye to reinforcing continuity, it tackles relevant labour market policy topics at several different stages in the text's development. For example, both bargaining and non-bargaining sections include comparisons of pure wage and profit-sharing contracts, implications of payroll tax and subsidy changes, and the work sharing versus layoff debate.

The text progresses systematically through three interrelated stages. The first (chapters 2 and 3) deals with unilateral human capital and employment decisions by the firm with respect to a marginal worker as well as bilateral firm–worker bargaining over investment costs and returns. Investment decisions as they affect the single firm's employment behaviour precede the construction of a macroeconomic model designed to evaluate unemployment effects. The firm–worker bargaining formulation is broadened in the second stage (chapters 4 and 5) in order to embrace bargains between the firm and a single union. These developments concentrate largely on a range of employment and bargaining issues that exclude human capital from the bargaining agenda. The firm–union bargaining models are then extended in the third stage (chapters 6 and 7) to incorporate human capital investment decisions. This work proceeds along two avenues. First, the bargaining framework is designed to include human capital investment decisions that affect the entire workforce, taken as representing a coherent and fully integrated work team. Secondly, the treatment of human capital itself is expanded so that investment decisions are seen as part of a wider range of firm-specific investments undertaken jointly and concomitantly by workers and shareholders. The latter developments involve the introduction of the so-called coalitional firm. This is compared and contrasted with the equivalent neoclassical constructs.

Although we review much of the most important existing literature in these areas, our primary intention is not to produce a comprehensive survey of relevant work. Rather, our main motivation is to extend the scope and coverage of the basic models in order to highlight broad avenues along which the subject has been and can be fruitfully developed. While other major labour market issues are considered, six of the topics incorporated in the text are especially worth highlighting since they deal with either existing areas of interest that we feel are worth investigating further or work that provides new and potentially productive areas for research developments.

(i) Human capital investment and labour productivity

Once-over and on-the-job training by the firm in production skills and organisational know-how are designed to increase workers' marginal products above their pre-entry endowments. In order to reflect this adequately, employment models incorporating training expenditures should accommodate the direct impact of the investments on labour productivity. Many of the models covered here incorporate explicitly both the costs of and the productive returns to human capital investment. Formally incorporating bargaining between the firm and its workforce into human capital investment decision making serves to underline the need to accommodate both costs and returns. An early seminal contribution in this respect is the work of Hashimoto (1979), which we discuss in chapter 2. This extends the firm/marginal worker approach to embrace the importance of bargaining over rents in the face of transaction costs in the employment relationship. Similarly, in our firm–union bargaining extensions in chapters 6 and 7, the need adequately to represent both the costs and returns of investments is particularly apparent. In all such models, the parties bargain over rent shares, the size of which are determined in part by the expenditure outlays on and the productive returns to general and specific investments.

(ii) Firm-specific human capital investments and unemployment

It is well known (see Salop, 1979) that the presence of labour turnover costs creates an incentive for firms to set wages in such a way that the sum of wage and turnover costs is minimised. Turnover costs arise when workers quit their jobs in order to search among available vacancies for a preferred position. Workers will be more reluctant to quit the higher the relative wage paid by the current firm and the higher the economy-wide unemployment rate. If all firms are identical, one possible equilibrium involves wage setting at such a level that the demand for labour falls short of the available supply. However, either explicitly or implicitly, much of this work has ignored the connection between firm-specific human capital investments and turnover costs. The higher the per-capita level of such investment, the higher the turnover cost associated with training replacement workers anew. In addition to the rise in turnover costs, higher spending on training will manifest itself in higher productivity. Consequently, if we want to examine the relationship between firm-specific human capital and unemployment, we must construct models in which the effects of both productivity and turnover costs associated with specific investments are accommodated. Such approaches may prove to be particularly useful in the light of current

debates in Europe and elsewhere over the efficacy of government attempts to stimulate national- or regional-level job training initiatives in order to combat unemployment.

(iii) Bargaining and fiscal intervention

Under the strictures of efficient firm–union bargaining, the choice of compensation structure – for example, between remuneration in the form of pure wages and profit sharing – has no effect on employment outcomes. However, we show that the incidence of payroll tax rates and ceiling limits, judged in relation to profit and income taxes, can lead to a specific preference by the bargaining parties for one form of compensation or another. Apart from general payroll tax considerations, we also home in on one aspect of the payroll tax system – the funding of unemployment insurance – in order to examine its implications for employment in an insider–outsider bargaining framework. These developments provide interesting extensions to the comparable, and quite extensive, literature stemming from a unilateral decision making firm (see, in particular, Hamermesh, 1993).

(iv) Human capital as a team investment

Much of the work on firm-level human capital has featured the implications of investment decisions with respect to the marginal worker. This has provided the dual advantages of simplicity and quite wide 'real world' application. In many instances, however, concentrating attention on the marginal worker is of limited appeal. In important cases, investments are carried out with respect to integrated teams or groups of workers (Oi, 1983). This is particularly the case for firms concentrating on product specialisation and volume production that require their workers to perform a set of interrelated tasks subject to relatively rigid formalisations of job descriptions and work routines. Also, team investment is common in firms where flexible work organisation and interrelated work activity are encouraged through such practices as quality circles and job rotations. Team-related human capital formation is not captured adequately in the 'standard' model dealing with a marginal worker and, in later developments, we re-formulate the model in order to accommodate these types of examples. The concepts of firm-specific human capital and team-oriented human capital investments are also closely intertwined. In what is termed as 'relational team' activity, Williamson (1985) highlights evidence to support the importance of corporate activities – and particularly those associated with the Japanese corporation – in which human assets are firm-specific and involve significant team elements. Indeed, the central importance of firm-specific

human capital to the development of employment theory necessitates that team-level investment decisions should play a central role. The concept of investment specificity is most naturally justified in relation to an integrated work team rather than a single worker; viz:

> performance in some production or managerial jobs involves a team element, and a critical skill is the ability to operate effectively with the given members of the team. This ability is dependent on the interaction skills of the personalities of the members, and the individual's work 'skills' are specific in the sense that skills necessary to work on one team are never quite the same as those required on another. (Doeringer and Piore, 1971, p. 16)

(v) Human capital and bargaining

Firm–union bargaining models are generally built around the idea that the two parties cooperate in order to gain a joint rent from their association. In other words, such models are predicated on the idea that the firm believes that by hiring union labour at the reservation wage it can make larger profits than it would if non-union labour were employed. Bargaining on the supply-side involves a union using its power – derived from its ability to withhold labour services – in order to capture a part of the surplus profit for its members. Bargaining agreements involve the firm achieving surplus profit (compared to using non-union labour) and the union achieving wages above reservation wages for its members. Optimal rent sharing under differing constraints is one of the main objectives of the agents within bargaining models. It is well known that, even in the absence of rents created by specific investments, it may be in workers' best interests to bargain collectively in order to offset the monopsonistic power of their employer. Such collective action is most obvious, however, where workers have firm-specific skills which they know are costly for the firm to replace. If specific skills are acquired on an individual basis then, as argued by Williamson *et al.* (1975), collective bargaining may be in the interest of the workforce as a whole since it serves to curb opportunistic bargaining behaviour by the individual in favour of overall efficiency objectives. Workforce gains may also be apparent if specific skills derive from team-related activity; organisational efficiency is enhanced by unions playing the role of monitoring the propensity for shirking and malfeasance by individual group members. If, through the incentive of rent shares, the union is perceived to control its members' potential to shirk and to act in part as a monitor of work performance then the firm may regard union bargaining as a particularly favourable climate under which to undertake significant human capital investments.[2] This would be expected to be particularly apparent where

large-scale team investments are in question. Under these circumstances, since union members' compensation derives in part from agreements over rent shares, we would expect in many instances that both the costs of and returns to training and related variables would appear on the bargaining agenda alongside wages and employment.

(vi) Organisational capital and the coalitional firm

Firm-level human capital analyses focus on profit, employment and other economic implications of one group (workers) undertaking training programmes in order to enhance pre-endowment marginal products. This process is particularly suited to the framework of the so-called neoclassical firm. This places an emphasis on the firm being managed in such a way as to maximise the benefits accruing to shareholders. In a more coalitional type arrangement – often stylised in the description of a Japanese organisation – shareholders and workers combine in order to seek organisational rent opportunities arising from several interfaces of their varying roles, attributes and objectives. Apart from human capital investments, organisational rent derives from firm-specific resources generated through such features as improved financial risk taking, stronger worker–management cooperation and greater flexibility in work organisation and internal financial allocation. Research work on the coalitional firm in relation to investments in organisational capital is identified most with the contributions of Aoki (e.g. 1984) and is dominated – given the key role played by the enterprise union in relation to shareholders – by game theoretic bargaining models. Our above mentioned firm–union bargaining interests in relation to the neoclassical firm provide the added advantage of allowing us to compare the relative performances of neoclassical and coalitional firms with respect to employment outcomes. As part of the analysis of the coalitional firm, we also emphasise the role of another feature typically associated with coalitional organisations in Japan. This is the concept of quasi-permanent employment whereby a core of regular workers receive a degree of job protection either through the additional employment of temporary workers and/or through the practice of subcontracting part of the firm's production to outside firms.

1.2 Route map

Two types of dichotomy with respect to decisions over human capital and employment are important to the overall developments. In the first place, we distinguish between decisions that are made unilaterally by the firm and those that are the outcome of a bargaining process between

management and workers. In the second place, we investigate decisions in respect of the marginal worker and those that are made in relation to a team or group of workers.

Chapter 2 is dominated by questions of labour demand within a profit-maximising firm. Aspects of the early Becker analysis of training investment (general and specific) and employment are taken as the starting point.[3] This is then extended to encapsulate Hashimoto's (1979) bargaining framework in which transaction costs play a central role. Related work on the estimation of wage–tenure profiles is also previewed. This work treats the labour input as a single, undifferentiated, factor. More realistically, however, the study of firm-level human capital investment lends itself quite naturally to a more general formulation of employment (Brechling, 1965; Rosen, 1968). This involves the distinction between stock and utilisation components of labour input and the chapter is dominated by a discussion of workers–hours demand models. Some familiar ground is covered, such as scale and substitution effects of changes in fixed costs and basic working hours. A number of relatively new topics are examined, however. These include the labour demand effects of switching from a pure wage to a profit-sharing compensation system and the implications for a number of earlier established results of incorporating different shapes of overtime cost schedules into the analysis. In the former instance, it is shown that introducing working time into the analysis of profit sharing can lead to significant modifications of standard Weitzman-type employment outcomes. In the latter, it is established that, for example, the employment and hours implications of reducing the length of the standard work week are considerably influenced by the choice of cost schedule. As a foretaste of the bargaining models of chapter 4 and beyond, the chapter ends by recasting several of the workers–hours issues within a firm–worker efficient contract framework. Specifically, the firm is assumed to choose an efficient contract that maximises profit while holding workers' utility constant.

Macroeconomic implications of human capital investment are considered in chapter 3. Attention is focused on three areas in which labour's quasi-fixity has implications for unemployment. In the first place, we discuss research work – much of which is empirically based – into the relationship between specific human capital investments and excess labour over the business cycle. The remaining two topics are more theoretically based and concern the influences for equilibrium unemployment of two, albeit interrelated, measurements of fixed costs. Our second topic highlights the role of turnover costs. These consist of the firm's direct and indirect monetary costs that are attached to quits and new hires. Purposely, we confine our definition of turnover costs to those

elements of expenditure that involve no productive return in themselves; examples include job orientation programmes and disruption of work schedules. This treatment permits the simplifying assumption that all firms produce the same good with an identical technology. The third area of interest concentrates more narrowly on specific training costs. A new hire in this respect involves both a cost and a productive return to the firm. This demands a model structure that both allows each firm to produce a differentiated product and permits changes in productivity that may alter the demand for labour at any given wage rate. The chapter ends with a policy discussion of a number of critical theoretical issues that lie behind arguments as to whether or not government subsidised training programmes can help to alleviate unemployment.

Motivating the adoption of firm–union bargaining models in the study of human capital and employment comprises the first part of chapter 4. The bargaining models that follow in the remainder of the book involve the extensive use of the so-called generalised Nash bargaining solution concept. Here, the two parties bargain over all endogenous variables (or at least those variables that directly affect the payoffs of both parties); these are variously taken to include employment, working time as well as human and physical capital investments. We also make use (in chapter 6) of a sequential bargaining structure in which bargaining takes place with respect to the wage while the firm unilaterally decides the levels of employment and human capital investments. The second part of chapter 4 is devoted, therefore, to a review and general discussion of the theory of efficient and sequential contracts.

Our development of bargaining models in relation to employment issues is carried out in two steps. In the first, in chapters 4 and 5, we investigate a number of employment and bargaining questions in the absence of human capital considerations. These chapters act as a bridge between the earlier unilateral decision-making and firm–worker bargaining models and the subsequent union bargaining models. We revisit the problems of choice of compensation system, the effects of payroll tax changes and the role of working time. Also, following the analysis of the efficient contract model in chapter 2, we investigate the role of unemployment insurance in significantly more depth in chapter 5. Some of these areas of interest recur also in subsequent chapters.

Specific topics in chapter 5 are as follows. We explore the role of working time within the bargaining framework; hours affect production and labour costs as well as worker utility. Pure wage and profit-sharing contracts are compared. In particular, we explore the implications of changes in payroll and other taxes on relative preferences for wages or profit shares. The introduction of workers' utility also allows us – via the

representation of 'outside' utility – to address questions about the effects on employment of changes in unemployment insurance. We investigate three kinds of unemployment schemes: these assume (i) unemployment benefits and payroll taxes are exogenously set by governments; (ii) taxes and benefits are set as in (i) but, additionally, the firm and the union face a budget constraint; (iii) the benefit rate is set exogenously but employment/wage bargaining takes place in the knowledge that the government will intervene to adjust payroll tax rates in order to balance the social welfare budget. We round-off the chapter with a wide-ranging labour market policy discussion set against the background of firm–union bargaining and dealing with employment and other reactions to price shocks, changes in union power, fiscal intervention and balanced budget constraints.

Chapters 6 and 7 bring together human capital, employment and bargaining. The importance of team investment is underlined in both chapters. The efficient contract models of chapter 5 are extended in chapter 6 to incorporate the costs of and returns to human capital investments on the bargaining agenda. Some familiar questions from early chapters are then investigated. The chapter then proceeds – via a two-period (i.e., training and production) bargaining formulation involving team-oriented general and specific training – to tackle a problem that is fundamental to the union bargaining literature. Why would a profit-maximising firm chose to bargain *ex-ante* with a union in the absence of political, social and economic pressures so to do? Investment by the firm in firm-specific human capital is seen as a key element in this decision. The question is tackled in relation to the example of foreign direct investment in a depressed region with excess labour supply. In essence, the perceived gains of not bargaining *ex-ante* have to be set against the perceived losses in the firm's share of rent resulting from the acquired, *ex-post*, bargaining power stemming from the specific skills that workers will possess at the end of the training period.[4]

The most recent literature on human capital has paid particular attention to Japan. There is evidence that per-capita levels of specific investment are higher in Japan than in the United States and Europe.[5] Much of the Japanese human capital literature has its roots in the traditional analysis of the neoclassical firm. However, an influential body of work, due principally to Aoki (1984), has viewed the Japanese firm as a coalitional arrangement between workers and shareholders who bargain over organisational rent. As mentioned earlier, this arises from a much wider set of factors than merely human capital considerations. Chapter 7 is designed to compare and contrast bargaining outcomes over employment, wages and rent sharing in neoclassical and coalitional

settings. After discussing Aoki's model of the coalitional firm, we then compare and contrast bargaining outcomes among so-called *A*-firms (United States neoclassical firms), *P*-firms (participatory firms) and *J*-firms (Japanese coalitional firms). *P*-firms and *J*-firms differ in that the former employ only regular employees while the latter employ quasi-permanent workforces. Special attention is given to comparative employment and organisational investment outcomes among the three types of firm.

In chapter 8, we offer a number of suggestions as to the areas in which future research might usefully be undertaken.

Notes

1 In his monograph on job training, Chapman (1993) points out the fact that unions have been largely ignored in human capital developments.

2 There is some evidence for this, at least with respect to the training aspects of human capital investments. First, in an econometric logit analysis of data from the British Social Attitudes Survey of 1987, Booth (1991) finds that union coverage has a significant positive influence on the training probability for both men and women. Secondly, in an international comparative study of national data bases on post school training experience of young men in the United States, Britain and Australia, Tan *et al.* (1992) find that 'union membership or union coverage in all three countries is usually associated with a greater likelihood of formal training...'.

3 Becker's seminal contributions to the subject matter of this book are (1962), (1964) and (1967); see Rosen (1993) for an overview of Becker's work.

4 The type of question we address with respect to *ex-ante* versus *ex-post* union bargaining is akin to a discussion in another context by Williamson *et al.* (1975). The authors discuss the infeasibility of sequential spot contracts where jobs involve significant idiosyncratic tasks. They observe: 'One possible adaptation is for employers to avoid idiosyncratic technologies and techniques in favor of more well-standardised operations. Although least cost production technologies are sacrificed in the process, pecuniary gains may nevertheless result since incumbents realize little strategic advantage over otherwise qualified but inexperienced outsiders. Structuring the bidding in such a way as to permit the least-cost technology and techniques to be employed without risking untoward contractual renewal outcomes is, however, plainly to be preferred. Two possibilitities warrant consideration: (1) extract a promise from each willing bidder at the outset that he will not use his idiosyncratic knowledge and experience in a monopolistic way at the contract renewal interval: or (2) require incumbents to capitalize the prospective monopoly gains that each will accrue and extract corresponding lump-sum payments from winning bidders at the outset.' In essence, the motivation for *ex-ante*