SEGMENTED LABOUR MARKETS: THEORY
AND EVIDENCE

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Abstract. This paper examines the possibility of accepting the labour market segmentation approach as a valid alternative to the classical and neo-classical analysis of labour markets. It consists of three main parts. The first part contains a historical analysis of both the distant and recent origins of the labour market segmentation hypothesis. Part two outlines the central ideas of both segmentationalists and radical theorists who attempted to explain the fragmented nature of labour markets and the importance of institutional and social influences upon pay, employment and mobility of individual workers between different labour market sectors. The third part examines the case for labour market segmentation using four alternative techniques and discusses the issue of mobility among different labour market segments. It is thereby concluded that the lack of agreement among the segmented labour market theorists on both theoretical and methodological issues has prevented them from developing a consistent and convincing argument based on verifiable empirical evidence to validate their thesis.

Keywords. Segmentation; Internal and external markets; Mobility.

1. Introduction
The theory of Segmented Labour Markets (SLM) has been identified with a group of economists who challenged the classical explanation of the workings of the labour market and argued that both the neo-classical and classical treatment leave unexplained many major labour market policy issues such as the dispersion of wages, and as a result income distribution, unemployment and discrimination. It is this fundamental accusation against the classical theory which lies at the heart of the segmentationalist approach. Insisting upon the fragmented nature of labour markets and the importance of institutional and social influences upon pay and employment, the segmentationalist approach shifts the emphasis away from the supply side of the labour market and places the focus on the demand side.

The thrust of classical economics is the study of maximising behaviour by individuals and firms. Rational economic agents constantly strive to maximise their economic well-being. In this approach, the maximisation of utility by individuals according to their own assessment of their well-being is ethically desirable and the working of unfettered markets is seen to co-ordinate attempts by individuals to maximise their economic well-being given the objective opportunities open to them.
In particular, neo-classical labour economics consists of the marginal productivity theory of demand based on profit maximising behaviour of employers and a supply theory based on utility maximisation by workers. The labour-supply theory, in turn, emphasises issues related to: individual productivity, such as decisions on investment in human capital which determines one’s skill or occupation, and leisure choices, which determine the amount of one’s labour supply. The wage structure is then taken as given, differentiated by worker attributes. Moreover, endogenous changes in tastes of individuals and details of the institutional framework of markets are largely ignored.

Segmentation theory on the other hand questions the existence of a direct linkage between the productive capacities of an individual and her wage as well as the allocation of that individual across jobs, implicit in the neo-classical and human capital version of labour market theory. In the SLM approach, labour market problems are considered against a dynamic framework in which maximising behaviour, to the extent that it does exist, is relatively unimportant compared to the neo-classical approach. Industrial organisation, product market and technological conditions, managerial control strategies and systems of labour market regulation are all recognised as having an influence on the structure of jobs and in contrast to the orthodox theory of the labour market, the distinction between ‘good’ and ‘bad’ jobs is not based on individual differences in productivity. Instead, as firms become the main agents structuring the system of employment, emphasis is placed on the development of institutional constraints in relation to pay formation, and the endogeneity of individual tastes.

Neo-classical theory assumes that individual workers can freely make a choice among a wide range of job options in the labour market, based upon their personal tastes, preferences, abilities and skills and thereby receive rewards on the basis of their human capital endowments. Segmentation theory on the other hand, argues that the labour market is not a single competitive market, but is composed of a variety of non-competing segments between which rewards to human capital differ because institutional barriers prohibit all parts of the population from benefiting equally from education and training. It is argued further that vulnerable groups of workers may become trapped in the lower segment of the labour market thereby limiting severely the mobility of employees between the lower and the upper segment so that excess demand pressures cannot compete away the wage differential. While the secondary sector earnings are influenced by supply and demand forces, primary sector jobs are insulated from such pressures. Thus the supply side explanations of human capital theory regarding the workings of the labour market are rejected and replaced by a more demand oriented theory.

Hence, what emerges as the crux of the SLM approach is the idea that the labour market segmentation that exists does not correspond to skill differentials in the labour market, but rather institutional rules are substituted for market processes. As a result, competitive pressures to equalise wage differentials are absent.
2. Theoretical development: a historical perspective

The segmentationalist approach has both a recent and a distant history. Its recent origins, which shall be examined later, go back to the 1960s when the persistence of poverty appeared to be the most important social problem motivating the SLM economists (Piore, 1970). Empirical findings of urban labour, poverty and unemployment in the USA in the 1960s were focused on the persistence of income inequality (Thurow, 1975) despite significant increases in governmental social welfare expenditures and a variety of anti-poverty and training programmes (Gordon, 1972). Focusing on the ghetto labour markets Gordon stated:

… the government became increasingly concerned with those central city areas in which unemployment rates remained especially high in the midst of general prosperity… For many workers in the ghetto…problems like low wages, job instability, menial work, low skills, poor worker motivation, discrimination, poor job information and inadequate job access seemed equally to demand attention. If you had one problem, you were likely to suffer from some of the others as well… (Gordon, 1972)

However, in a longer perspective, the segmentationalist approach may be seen as a continuation of older debates. More especially, it may be traced back to Cairnes, John Stuart Mill and Pigou who, dissatisfied with Adam Smith’s competitive conception of the labour market, argued in favour of institutional realities which defy the workings of the competitive labour market. The American Institutionalist school of thought in the early 1900s was built upon this tradition and developed the so called ‘structuralist’ and ‘balkanised’ models of the labour market. (Dunlop, 1957; Kerr, 1954)

2.1. Adam Smith: Of the wages of labour

Adam Smith focused on the discussion of ‘equilibrium wage differences’, by which he meant the wage premiums occasioned by certain conditions of employment, while Cantillon was the first writer to broach the subject in a systematic way. Cantillon maintained that workers similarly trained and similarly endowed in every other respect will nevertheless earn more or less according to the degree of time and expense in acquiring skills, the degree of risk in employment and the extent of trust required of employees.

In the Wealth of Nations (Book I, Chapter 10, Part I) Smith provided the arguments for wage differentials based on ‘compensating differentials’. According to him wages vary:

1) in inverse proportion to the agreeableness of the employment
2) in direct proportion to the cost of learning the business
3) in inverse proportion to the constancy of employment
4) in direct proportion to the trust that must be placed in the employee and
5) in inverse proportion to the probability of success.
However, what is frequently overlooked is the fact that despite his adherence to arguments supporting the competitive workings of the labour market to equalise wage differentials, Adam Smith recognised that certain institutional constraints exist which might foster pay inequalities among individuals who are initially endowed with the same skills. In particular, he argued that apart from the inequalities arising from the nature of the employments themselves, as outlined briefly above, other inequalities may arise. Smith explained that the laws and regulations concerning the apprenticeship system and the practices of what he called an ‘incorporated trade’ were a serious impediment to labour mobility either within the same establishment or from one establishment to another similar one. As a result, competitive pressures to equalise wage differentials may prove to be absent.

The statute of apprenticeship obstructs the free circulation of labour from one employment to another, even in the same place. The exclusive privileges of corporations obstruct it from on place to another, even in the same employment. It frequently happens that while high wages are given to the workmen in one manufacture those in another are obliged to content themselves with bare subsistence. (Smith, 1910, p. 122)

2.2. The theory of non-competing groups in the labour market: John Stuart Mill’s and John Cairnes’ criticisms of Adam Smith’s conception of the labour market.

Arguments regarding the functioning of the labour market have been long-standing. The main disagreement is in respect to wage determination with Smith, as the forerunner of the neo-classical school, emphasising the competitive nature of the labour market and Mill and Cairnes arguing in favour of institutional rules substituting for market processes. Both of the above emphasised the existence of non-competing industrial groups as a feature of the labour market. Cairnes wrote:  

What we find, in effect, is not a whole population competing indiscriminately for all occupations, but a series of industrial layers, superposed on one another, within each of which the various candidates for employment possess a real and effective power of selection, while those occupying the several strata are, for all purposes of effective competition, practically isolated from each other. … [T]he average workman, from whatever rank he be taken, finds his power of competition limited for practical purposes to a certain range of occupations, so that, however high the rates of remuneration in those which lie beyond may rise, he is excluded from sharing them. We are thus compelled to recognise the existence of non-competing industrial groups as a feature of our social economy. (Cairnes, 1874, pp. 66 & 68)

A new class of considerations was then opened which was hardly taken into account before by Adam Smith and other political economists. Mill analysed the effects of education and social class as being the determinants of ‘pre-market segmentation’ resulting from characteristics or attributes acquired by workers
prior to entering the workforce. With reference to Adam Smith’s ‘compensating differentials’ Mill argued:

…it is altogether a false view of the state of facts to present this as a relation which generally exists between agreeable and disagreeable employments… the more revolting the occupation, the more certain it is to receive the minimum of remuneration, because it devolves on the most helpless and degraded, on those who from squalid poverty, or from want of skill and education, are rejected from all employments… the inequalities of wages are generally in an opposite direction to the equitable principle of compensation erroneously represented by Adam Smith as the general law of remuneration of labour. (Mill, p. 388)

In other words, the existence of non-competing groups means that competition will not bring into equality the rates of return on different forms of human capital investment as Smith and the neo-classicals suggest. Moreover, Mill’s reference to the entrapment of the disadvantaged workers in undesirable occupations reflects a concern with factors that might cause ‘in-market segmentation’, i.e. inequality generated as a result of market processes. The existence of certain labour market institutions, such as the restrictive practices of the guild system, has severe consequences in that it may establish and renew immobility between the different sectors of the work force.

So complete, indeed, has hitherto been the separation, so strongly marked the line of demarcation between the different grades of labourers, as to be almost equivalent to a hereditary distinction of caste; each employment being chiefly recruited from the children of those already employed in it, or in employments of the same rank with it in social estimation, or from the children of persons who, if originally of a lower rank, have succeeded in raising themselves by their exertions. (Mill, p. 393)

2.3. Pigou: a classical view on segmentation

Writing in 1944, Pigou, one of the most eminent classical economists, concluded that often labour markets failed to clear, as the classical competitive model indicated, implying thereby, that workers might not always be engaged in ‘thorough-going competition’ for jobs. The reasons Pigou outlined to support his ideas were primarily of an institutional nature and although he presented factors such as trade unionism and the availability of unemployment compensation, as some of the main obstacles to the classical functioning of the labour market, here we shall concentrate upon his views on labour market segmentation.

Pigou realised that labour markets are segmented, not only due to mere skill differentials, experience and competence, as these define purely the heterogeneous nature of labour as a factor of production, but also due to the restricted movement of labour between and within industries. He argued that many ‘centres of production’ exist within the labour market and the observed immobility of labour...
between those centres was the result of ties that the workers developed with respect to the locality of the centre, its specialisation or the jobs available within it. ‘…labour is not perfectly mobile among centres of production, but specified numbers of work-people are tied to the several centres as the result, maybe, of historical accident.’ (Pigou, 1945, p. 19)

Nevertheless, even in such a segmented labour market, the presence of thorough-going competition within each centre, the segment, would clear the market, although it would not be able to compete away wage differentials between the different segments for otherwise identical workers. ‘…thorough-going competition among wage-earners would secure that full employment was established everywhere except in centres where, in order to establish it, wage rates would need to be nil or negative. … there will be full employment, but divergent wage rates.’ (Pigou, 1945, p. 19)

It is obvious therefore, that Pigou clearly understood the importance of institutional factors responsible for obstructing the competitive workings of the classical labour market.

2.4. The American Institutionalist School of the 1940’s and 1950’s

The American Institutionalist school of thought could be regarded as the interim stage between the recent and distant origins of the SLM approach. Their argument was that labour markets did not function in line with the equilibrium analysis of the day, but their operation was influenced by the complexity of the modern economy and determined by the contemporary institutional establishments, such as large bureaucratic corporations and unions.

Dunlop (1957) talked in terms of ‘the institutional study of the decision making process, internal to a management organisation or a union…’. He introduced the concepts of ‘job clusters’ within firms and ‘wage contours’ across the labour market, as being the mechanisms seeking to relate an internal wage structure corresponding to the internal labour market (ILM), produced by the large firm or the union and an external wage structure corresponding to the external labour market.

Kerr (1954) wrote in terms of ‘institutional markets’ whose ‘dimensions are set not by the whims of workers and employers but by rules, both formal and informal’. In contrast to Fisher’s (1953) ‘structureless market’, Kerr identified five distinct sources producing barriers, which divide the labour market into distinct compartments:

1. the preferences of individual workers
2. the preferences of individual employers
3. the actions of the community of workers
4. the actions of the community of employers and
5. the actions of government. (Kerr, 1954, p. 96)

The result is a ‘Balkanised’ labour market where institutional rules set well-defined boundaries between its ‘internal’ and ‘external’ components. The ILM is
an administrative unit, the pricing and allocation of labour being determined by a set of administrative rules and procedures. In the external market, pricing and allocation are determined by supply and demand. (Kerr, 1954, p. 102)

The above neoinstitutionalist theories supporting the existence of an ILM were used by the segmentationalists of the 1970s, 1980s and 1990s as a building block for constructing the recent SLM approach. However, different writers saw labour market segmentation under a different perspective and delineated segments in the labour market by using different rules. It would thus be useful to examine next all these proposed sources of segmentation and identify the proponents of these theories.

3. Sources and descriptions of segmentation

The contemporary segmentationalist literature is highly varied. Analyses differ with respect to the delineation of segments and also the associated sources of segmentation. However, straddling these differences is the emphasis placed on the existence of the within-firm labour market as the central decision making body for issues such as hiring contracts, pay, job rewards and on-the-job training, which is relatively shielded from the external spot market. Hence the main empirical hypothesis of the SLM approach is that observed wage differentials are not a result of underlying skill differentials, but rather a direct consequence of the ‘dual’ nature of the labour market.

The neo-classical theory of labour markets yields predictions about wages and employment by concentrating on supply side variables and making a minimal number of assumptions. Emphasis is placed on public investments in general training as well as on private investments in specific training (Becker, 1964). As a result, human capital explanations of wage inequality have focused on the heterogeneous nature of workers, which most commonly tends to include differential investments in human capital, as the primary cause of wage differentials (Mincer, 1974). In other words, one worker may earn more than another in the labour market because he is more highly educated or skilled, while workers with certain skills will be paid higher wages than others with minimum or no skills within the same firm simply because their skills are translated into higher marginal productivity. Moreover, higher wages are paid to workers found in jobs with unattractive job attributes, such as monotony or high probability of accident occurrence in order to offset those attributes.

In contrast, in the SLM literature duality in the labour market implies that all jobs belong to either the ‘primary sector’ or the ‘secondary sector’ of the labour market. The primary sector contains all the ‘good’ jobs, normally to be found within firms with internal labour market structures, where institutional rules are substituted for market purposes. Those jobs are characterised by high negotiated wages, economic security and rapid turnover leading to career advancement. The secondary sector on the other hand, contains the ‘bad’ jobs which are typically unskilled, offer no regular career ladders and wage rates are low and determined competitively.
This section will therefore propose to outline the central ideas of several new theories attempting to explain the fragmented nature of labour markets and the importance of institutional and social influences upon pay and employment.

3.1. Piore, Doeringer and Piore and the dual theory

Building upon the work of Kerr and Dunlop, on the concepts of internal and external labour markets, Doeringer and Piore developed the ILM theory into a useful analytical instrument in order to outline the basic ideas of labour market duality and deal with the variety of policy concerns of the 1960s, such as structural unemployment, technological change, racial discrimination and the employment and training of the ‘disadvantaged’ workers. The ILM therefore represents the integration of a wide range of ideas on labour market structure, labour mobility and wage determination and was thereby defined as:

… an administrative unit, ..., within which the pricing and allocation of labour is governed by a set of administrative rules and procedures. The internal labour market governed by administrative rules, is to be distinguished from the external labour market of conventional economic theory where pricing, allocating and training decisions are controlled directly by economic variables. These two markets are interconnected however and movement between them occurs at certain job classifications which constitute ports of entry and exit to and from the internal market. (Doeringer and Piore, 1971, p. 2)

Piore (1975) and later Rebitzer and Taylor (1991), argued that labour market segmentation is a response to flux and uncertainty in a market containing an idiosyncratic factor of production. In particular, the primary sector is organised so as to shelter workers and firms from that uncertainty. Doeringer and Piore outlined two important factors responsible for the emergence of an ILM structure. The first is based on the notion of skill specificity. This entails the increased training, recruitment and screening costs incurred by the employer in order to fill those vacancies with a high skill content with the appropriate candidates. In other words, as skills become more specific, employee training becomes more specialised and demanding, thus encouraging the employer to invest in expensive recruitment and screening methods in order to minimise turnover and thereby reduce costs.

The second factor is custom or customary law within which notions of ‘equity’ and ‘fairness’ are expressed through an unwritten set of rules based largely upon past practice or precedent. The device of such notions is deemed necessary if a cordial industrial relations climate is to prevail and stability of employment, a central feature in the ILM structure, is to be encouraged.

For Doeringer and Piore (1971, p. 40) stability of employment is the most prominent feature of the ILM. The introduction of career ladders and mobility chains, on-the-job training, pension schemes, rewards and discipline systems and the exercise of strict managerial control over the workforce are designed to build a
stable and loyal core personnel. Stability brings along rigidity and irreversibility in
the administrative rules, which in turn creates solid and cohesive ILM structures,
which are favoured by employers because they reduce the costs of turnover
among workers who have been provided with enterprise-specific skills.4

Having developed a more detailed ILM theory than their predecessors,
Doeringer and Piore, attempted to link it to the ‘Dual Labour Market’ theory,
which had emerged through the writings of a group of economists, such as
Harrison (1972), Averitt (1968) and Bluestone (1970), to explain the persistence
of urban poverty and unemployment in the USA despite the introduction of
training programmes to increase the human capital of the disadvantaged workers
as proposed by orthodox economists. The theory postulates a dichotomy of
the labour market over time, into two separate sectors, ‘primary’ and ‘secondary’.

The primary sector is seen as being composed of a series of well-developed
ILMs (Doeringer and Piore, 1971, p. 167). The internal labour market in the
primary sector does not function primarily along profit-maximising lines. Rather
institutional rules are substituted for market processes. The employment relations
of a representative firm in the high-wage sector are structured and governed by
formal rules, set mostly by trade unions, and informal rules which together cover
the content and wage rate attached to each job, hiring requirements, promotion
opportunities as well as the organisational structure that ties jobs together. As a
result the ILM is protected against external wage pressures and most importantly
for the SLM theory, mobility between the two markets is limited to the extent that
excess demand pressures cannot compete away the wage differentials. Hence jobs
in the primary sector appear to exhibit characteristics such as high negotiated
wages, great promotion possibilities, good working conditions, equity and
employment stability. Jobs in the secondary sector of the labour market, on the
other hand, are those outside ILMs, those in poorly developed ILMs, which
possess formal internal structure but also many entry ports, short mobility clusters
and low-pay work, and those in well developed ILMs which however are not
attached to formal promotion lines. (Creedy & Whitfield, 1988, p. 259). Thus, on
the whole, secondary jobs tend to have low pay, little possibility for advancement,
poor working conditions, high labour turnover and often harsh or arbitrary
discipline.

Moreover, in terms of distinctions made between workers in the two sectors,
their approach implies that those are parallel to the ones made between jobs. In
particular, workers in the secondary sector relative to those in the primary sector:
‘… exhibit greater turnover, higher rates of lateness and absenteeism, more
insubordination, and engage more freely in petty theft and pilferage. Disadvantaged workers are confined to the secondary market by residence,
inadequate skills, poor work histories and discrimination.’ (Doeringer and Piore,
1971, pp. 165–166)

Dualism in Piore’s opinion seems to be primarily manifested in the industrial
structure of the economy and emphasis is hence placed on the demand side as
opposed to the supply-side focus of neo-classical economics on worker attributes.
Firms facing stable product demand tend to create primary conditions for

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employment. The reason for this is to be found in the skill specific nature of labour which becomes a ‘quasi-fixed factor of production’ due to the huge ‘sunk’ costs invested in the specialised training of the firm’s employees. It is only those firms faced with stable product demand that can afford large investments in modern capital intensive up-to-date technologies, which in turn create the need for high skill specificity on the part of employees, generating thereby, ILM structures. In contrast, those firms experiencing variable demand for their products, will tend to engage in labour intensive production techniques, avoiding the sunk costs of capital investment and labour training. Thus the dichotomy develops for the same reason that gives rise to ILM structures: that is cost minimisation.

However, later on Piore suggested redefining the primary sector as being composed of two segments, or tiers as he called them, the upper and the lower. The upper tier of the primary sector consists of professional and managerial jobs which involve high pay and status, great opportunities for advancement, but also high mobility and turnover patterns, which normally tend to describe those in the secondary sector. On the other hand, workers in the lower tier tend to have, in comparison to those in the upper tier, lower average pay, less opportunities for promotion and more rigid administrative rules and procedures for wage setting and labour allocation. Piore then uses this new redefined theory of labour market segmentation in an attempt to link labour market structures to socio-economic subclasses in the society. Therefore in order to prove that socio-economic movement in our society is not random but occurs through set regular channels, Piore uses the concept of ‘mobility chains’ to describe those channels.

The points along a mobility chain may be termed stations: they generally include not only jobs but also other points of social and economic significance. Thus people in a given job will tend to be drawn from a limited range of schools, neighbourhoods, and types of family backgrounds; and conversely, people leaving the same school or neighbourhood will tend to move into one of a limited set of employment situations. (Piore, 1975, p. 128)

Class based segmentation may then offer not only an explanation for the labour market segmentation but also for the relative immobility between segments suggested by the dualists. Disadvantaged workers become confined to the secondary sector, not because of any difference in ability or skills but because of the negative feedback they get from interacting with people of their own class only and hence suffering from the impact of institutional forces on them, such as discrimination.

The dual labour market theory is most applicable to blacks in urban slums, these workers seem to be trapped in a world where all of the segments of their life reward a single set of behavioural traits and offer a single set of behavioural models. To attempt to change one component of that setting by opening primary jobs may not be enough, since other aspects of their lives continually pull them back to secondary behavioural traits. (Doeringer and Piore, 1971, p. 180)
While Doeringer’s and Piore’s analysis has much in common with that of neo-classical theorists an important difference is the rejection of the notion that the wage competition model describes accurately and totally the workings of the labour market. Jobs in high-wage sectors are not allocated by strict price rationing and returns to human capital investments differ among each sector. Some people who are qualified for and desire employment in the primary sector are unable to get it due to institutional barriers preventing intersectoral mobility while upward mobility is observed only in the ‘good’ jobs.

3.2. Wachtel; Edwards, Reich and Gordon; and the radical theory

Radical theories of segmentation are similar to dual labour market theories in stressing institutional change and behavioural rules as the most important elements determining the nature of the labour market and the labour process.

The labour market consists of those institutions which mediate, effect or determine the purchase and sale of labour power; the labour process consists of the organisation and conditioning of the activity of production itself, i.e. the consumption of labour power by the capitalist. Segmentation occurs when the labour market or labour process is divided into separate submarkets or subprocesses, or segments, distinguished by different characteristics, behavioural rules and working conditions. (Edwards, Reich and Gordon, 1975 p. xi)

However the proponents of these theories appear to place more emphasis upon the ‘social relations of production’ and maintain that: ‘… segmentation arises not from market forces themselves but rather from the underlying uses of labour power.’ (Edwards, 1979 p. 165) Concerned with the problems of persistent poverty and unemployment in the USA in the 1960s, Edwards, Reich, Gordon and Wachtel sought to examine the important divisions and income inequalities in the American working class by focusing on the evolution of American capitalism. They proposed that segmentation of the labour process and labour markets came to replace the stages of proletarianisation, in which wage labour was the dominant manner of organising production, and homogenisation, in which production was the outcome of common repetitive, semi-skilled operations.

Dualism in the labour market, as described by Piore and Doeringer, emerged as a consequence of a new dualistic industrial structure. The competitive local-market-oriented nineteenth century factory system, which eliminated many skilled crafts and created a large pool of identical semi-skilled line workers engaged in mass mechanised production of goods, gave way to a more closed, oligopolistic national- and international-market-oriented capitalism dominated by giant corporate enterprises, whose main concerns were: ‘…the creation and exploitation of monopolistic control, rather than the allocational calculus of short-run profit maximisation.’ (Edwards, Reich and Gordon, 1975 p. xii)

In particular, as the monopoly capitalist firms grew larger and powerful, their control over forces, which might have threatened their existence, became tighter.
Hence, their attempt to secure sufficient and good quality supplies of raw materials and labour led to their operations being vertically integrated and altered the nature of their internal relations. The latter involved the intensification of hierarchical control as the means for controlling the proletarian-in-character labour movement, which had gained strength and militancy in the earlier years. The new system of control, which initially emerged out of those workplaces that tended to employ educated white collar workers, was the so-called system of ‘bureaucratic control’. Bureaucratic control abolished the personal supervision by subjective foremen, who frequently evoked brutal and unstable worker responses, for a more subtle means of monitoring the workforces, in which the exercise of power became institutionalised and impersonal.

However, along with the dualism in the industrial structure, there developed a corresponding dualism in the working environment, wage structures, and mobility patterns among different working sectors. The reorganisation of the internal relations of the capitalist enterprise, which exhibited both stable production and sales, created ILM structures reflecting that stability. In particular, bureaucratic control in ‘core’ monopoly corporations with stable market demand conditions, preserved employment stability by creating career ladders and rewards for tenure and seniority within the firm. In ‘peripheral’ firms, though, where product demand was unstable, workers experienced lower earnings and higher turnover rates. Moreover, it is believed that little mobility exists between the sectors while ILMs, which were described as being the inevitable creation of monopoly capitalism, clearly form the largest part of the ‘core’ (primary) sector.

The result was the ‘stratification’ of the working class; a term used by many contemporary radical political economists to imply: ‘...the historical progress whereby political forces encourage the divisions of the labour market into separate sub-markets...distinguished by different market characteristics and behavioural rules.’ (Reich, Gordon and Edwards, 1973 p. 359) Hence: ‘...firms organised bureaucratically operate through one set of labour markets, the primary markets, while those organised along lines of simple hierarchy operate through other markets, the secondary markets.’ (Edwards, 1975)

Some radical political economists argued in favour of a further division residing within the primary labour market. In an exposition similar in some respects to that of Piore, Edwards refers to an ‘independent primary’ and a ‘subordinate primary’ segment. Regardless of the number of segments though the underlying idea remained the same; the rise of monopoly capitalism was accompanied by a stratification of labour in which workers became highly differentiated in terms of earnings, employment stability and status. The roots of this segmentation were to be found both in technological changes and in the developments in the social relations of production.

3.3. Thurow: the job competition model and queue theory

Thurow’s job competition model, which encompasses neo-classical firm optimisation behaviour and hence appears to be the closest to the orthodox...
position, places great emphasis on the importance of on-the-job training in determining pay and employment levels in the labour market. As opposed to the neo-classical model of wage competition, where individuals compete against each other on the basis of cognitive job skills acquired before entering the labour market, in the job competition model the individual’s earnings depend upon the quality of the job she acquires.

Wages depend on the characteristics of the job in question and individual workers are ranked on the basis of their ‘trainability’. Because individuals have different ‘background characteristics’ such as education, innate abilities, age habits, personalities etc., they tend to incur different potential training costs for each job they enter. Hence the existence of a ‘labour queue’, on which workers are ranked on the basis of their training costs, determines the order of access to job opportunities. It is the interaction of this labour queue with the ‘national’ distribution of jobs that determines the earnings distribution and may result in initially equally productive workers being paid different wages.

Hence, the most preferred workers are those whose background characteristics result in their having the lowest training costs with respect to any job. Two very important points are worth noting here: (a) the number and type of jobs, and hence training slots, are determined by the degree of technical progress and (b) the clearing of labour markets depends on the flexibility and success of the on-the-job training process which in turn is dependent upon the elimination of direct wage and employment competition.

What the above implies is that neo-classical labour market structures, based on wage and employment competition cannot go hand in hand with the neo-classical assumption of employer’s cost minimisation objectives. Any neo-classical type wage and employment competition would act as a disincentive to the process of on-the-job training, where the passing on of skills and knowledge on the part of a workforce is crucial for the long run profitability of the firm.

In this context, ILM structures can be seen as the direct means of repressing wage competition and generating the necessary security of earnings and employment. Thurow’s model can therefore, be seen as creating a link between the neo-classical assumptions regarding the firm’s optimisation behaviour and the emerging theories of ILMs of the late 1960s and early 1970s, where the formation of rigid wage and employment structures appear to emanate from the requirement for the minimisation of training costs.

3.4. Okun: career labour markets

Okun’s analysis of the labour market takes Thurow’s model a step further in that firms are not only required to minimise the wage and training costs of their employees at any one time but also to develop effective mechanisms ‘...to provide and assess productivity and to build a reputation that will both enhance the supply of willing applicants and hold down quit rates.’ (Okun, 1981, p. 81)

To achieve these goals therefore, the majority of firms pursue career personnel strategies which involve the creation of a hierarchical employment structure
within the firm through which formal rules are set with regards to recruitment methods, wage-setting schemes, ‘promotion ladders’, reward and discipline procedures and monitoring of work. A labour market composed of firms operating under a set of structured employment relationships is defined by Okun (1981) as a Career Labour Market (CLM). Following his definition and description of CLMs one can easily discern a striking similarity to the ILMs concept developed by Doeringer and Piore (1971).

The idea of an ILM has permeated through the SLM literature in an attempt to explain the wage differentials between workers of initially equal productivity. CLMs are institutionalised hierarchical structures which are isolated from the external labour market where pricing and allocation of labour are determined by market forces. As in the previous theories, the ‘ports of entry’ between the two markets are limited and on-the-job training is important in developing most skills within the internal structure. As a result career-oriented employees are protected from outside competition and assured by the potential employer at the start of the hiring process of a lengthy ‘partnership’ as well as of their occupational advancement within the firm.

According to Okun, in a CLM, both the employer and the employee are tied up in an arrangement of ‘mutual investment’ essential if long-term employment is to be established and maintained. The principal aim in this set up is for the employer to amortise the ‘toll’ in the long run, i.e. the screening, hiring and on-the-job training costs of the new recruits while maximising his profits and for the employee to achieve and maintain a top quality of workmanship and productivity. However, the substantial costs for both firms and workers created by screening and training, lead to reduced labour mobility which in turn affects the mechanisms for setting wages in the labour market.7

Firms following the career labour strategy develop a particular mode of organisation — the CLM — where:

(a) the internal wage structure does not correspond to market mechanisms but follows an incremental-salary-scale path starting from payments lower than the value of the marginal product of the employee, yet higher than her best alternative opportunity, and advances to the top of the remuneration ladder usually through the acquisition of skills and experience

(b) recruitment is based on formal rules with new recruits filling the lower level jobs on entry, while senior posts being filled by internal promotions and

(c) rewards systems are used to motivate workers and induce their loyalty to the firm, while enhancing their productive performance.8

The attachment created between employer and employee, as described in Okun’s ‘toll’ model, suggests the inevitable creation of a bilateral monopoly surplus, which may prove to be problematic in the long run as product demand fluctuates. Not all employers however would follow the same pattern of hiring, training and wage setting. In a neo-classical world, cyclical changes in product demands are usually translated partly into changes in employment and partly into
changes in wages. On the other hand, Doeringer and Piore argued that firms with stable product demand are more likely to develop internal market structures. Hence applicants, although initially of equal productivity, will receive returns to their human capital investments in line with a two-tier wage strategy. Due to the split, which emerges in a CLM model between the casual sector and the career sector of the labour force, one would therefore, expect that wages for jobs filled with casual labour would respond much more to cyclical weaknesses of the product, and hence the labour market, than wages for career jobs.

Thereby, the strong inflexibility in the career segment of the labour market and the implied rigidity of wages is best explained with reference to Okun’s famous so called ‘invisible handshake’. As opposed to Adam Smith’s invisible hand, which cannot operate effectively in the career labour market, the invisible handshake describes the employer-employee relations by making use of ideas associated with the ‘Implicit Contracts’ theory based on the work of Baily (1974), Azariadis (1975) and Gordon (1974).

Implicit contract models recognise that the labour market in practice is not a spot auction market. Instead, the main idea is that firms and workers can maximise profits by reducing risk. In other words, both parties may engage in an implicit agreement in the form of shared informal understanding as to how each party will respond to various contingencies. Risk averse workers are thereby provided with a level of wage income which remains stable over the cycle.9

The brief review above has shown that the theoretical seed of SLM is not new. The non-homogeneous character of the labour market was first acknowledged by the classical economists and later developed by the American Institutionalist School. What is new however, is the emphasis placed by the new SLM theorists on the importance of institutional and social influences upon pay and employment. Despite their differences, with regards to the causes of segmentation, they all seem to agree on the dualist nature of the labour market. It is suggested that the mechanisms governing wage and employment determination differ between the two segments and that the neo-classical theory of human capital is not applicable in the lower segment. Let us therefore take a closer look at the empirical evidence before we reach our own conclusions.

4. The evidence: methodological and theoretical issues

Virtually all labour market studies have shown that the labour market is segmented in some sense. Classical models recognise that labour markets are segmented due to geographical and biological factors, especially age, which cause labour inputs to be imperfect substitutes for each other, while the SLM literature tends to stress institutional factors as the main causes of segmentation. Ryan (1984) defines segmentation in general as ‘…the failure of the labour market to treat its participants even-handedly, in that it accords significantly different opportunities to otherwise comparable people.’

Labour market segmentation though, does not constitute a single unified alternative to neo-classical theory. There appear to exist almost as many versions
of segmentation as authors in this field. Nevertheless, Ryan (1984) and Psacharopoulos (1978) outline three key propositions central to the segmentation theory, which form the basis for a series of tests attempting to confirm or reject the segmentation hypothesis:

1. few clearly identifiable segments exist within the labour market, the delineation of which is not a clear and established statistical procedure;
2. mobility barriers prohibit the movement across different segments and hence imply that labour markets do not clear and;
3. each segment has different employment and wage setting mechanisms and the neo-classical theory of human capital is little or not applicable in the lower segment of the labour market.

Hence, the interesting question, which this part will attempt to answer is not whether the labour market is segmented, but rather along what lines. In conducting an empirical examination of labour market segmentation therefore, two methodological issues are of major importance; the first issue involves defining and delineating segments within the labour market while the second examines how this procedure is related to a series of statistical and econometric techniques which test each one or all of the above three main hypotheses.

4.1. The creation of segments

Just as there are differences in the theoretical formulations of segmentation, there are also differences in the criteria and methodology used to define and create segments in the labour market. In its earlier formulation, the segmentation hypothesis was based on the idea that the labour market was divided into two separate and virtually self-contained parts, the primary and secondary segments of the labour market. (Doeringer and Piore, 1971)

However, the literature does not contain any single operational characteristic or a testable empirical hypothesis for identifying the demarcation boundaries between the two segments or indeed determining how many segments are appropriate. Initially there existed checks for bimodality of the distribution of earnings and other measures of job quality but no evidence was found that the earnings distribution was bimodal in practice. (Psacharopoulos, 1978) Researchers therefore, have resorted to using a number of different criteria to define segments. Therefore, one source of confusion is the different variable bases used to determine the segment to which an occupation is to be assigned.

Some researchers use job characteristics to define segments. Flatau and Lewis (1993) used information on a broad range of job characteristics, thought to describe primary sector employment, including wages, employment benefits, general and specific training opportunities and requirements and job security, to delineate segment boundaries in the Australian labour market in accordance with the dual labour market hypothesis.

In the US Rosenberg (1980) focused on the low income areas in Brooklyn, Detroit and San Francisco and assigned occupations in the two segments of the
labour market by using four job dimensions representing training, education, nature of the job and wages level. While Boston (1990), using data from a supplement to the 1983 US Current Population Survey identified two labour market sectors, a primary and a secondary, on the basis of the workers’ answers to the question of whether specific skills or prior training were conditions for employment. In the Netherlands, Van Ophem (1987), by making use of a similar technique, based on eight quality job characteristics allocates the jobs to three segments, a primary sector consisting of two tiers and a secondary sector, in line with Piore’s (1975) latest representation of SLMs.

Other researchers use industrial characteristics to define segments. One version of LMS between types of jobs is associated with a duality in the industrial structure of the economy. (Edwards, Reich and Gordon, 1975) The dichotomisation of the industrial structure between what has been called ‘core’ and ‘periphery’ industry sectors, stems from such factors as technology, organisational structure, the nature of product demand and union power and involves a considerable overlap with the division of the labour market between primary and secondary segments.

McNabb (1987) allocated workers to a primary and secondary segment by using two factors, generally associated with disadvantaged employment, to divide the British industry between core and periphery sectors: a) the proportion of females employed in each industry and b) the proportion of workers not covered by any form of collective agreement. However, by contrast to the dualistic approach of high-wage and low wage segments, Osberg et al. (1987) used a stratified random sample of private employees and assigned them to six segments defined with respect to the product market characteristics of the employing establishment. The same sample though, was later dichotomised when Baffoe-Bonnie (1989) assigned a priori each one of the above six industrial sectors to a high-wage primary segment and a low-wage secondary segment.

In contrast, some researchers use subjective measures to define segments. Osterman (1975) used the 1967 US Survey of Economic Opportunity to arbitrarily classify jobs into a secondary sector and a primary sector consisting of two tiers. He subjectively assigned jobs to sectors based on factors judged to be important by dual labour market theory, (Piore, 1975). Jobs placed in the secondary sector were characterised by low wages and unstable employment patterns, upper tier primary sector jobs were high wage jobs with a high degree of worker autonomy and all other jobs were classified as lower tier primary sector jobs. Classifications were based on the following four criteria borrowed from Robert Blauner (1967):

1. the separation from the ownership of the means of production and the finished product
2. inability to influence general managerial policies
3. lack of control over conditions of employment and
4. lack of control over the immediate work process.

Finally segments were defined by the use of occupational rating scales. In Britain Psacharopoulos (1978) and McNabb and Psacharopoulos (1981) used the
Goldthorpe and Hope occupational rating scale to assign individuals to two labour market segments, the primary and secondary. This scale was constructed by classifying occupations (as defined by the Census Office) into ‘occupational grading units’ according to the nature of the work task they involve and the status of their employment. Each occupation was subsequently given a grade on a scale reflecting its desirability in terms of the prestige attached to it. The basis of this grading was defined independently of the rewards and requirements of jobs through a survey in which people were asked to assess the social standing of particular jobs.

4.2. Statistical and econometric techniques

This section will present a statistical and econometric analysis of the two most important claims of the segmentation hypothesis; a) that there is a distinct low-wage labour market in which there are no returns to schooling, experience or in some cases tenure and workers do not receive on-the-job training and b) that there are non-economic barriers that prevent mobility across sectors. The latter is crucial to the segmentationalist theory because the existence of inter-sectoral mobility would imply the equalisation of wages between sectors, i.e. any differentials would simply be competed away by firms and workers.

Studies on the validity of the above claims have concentrated on four distinct methods of analysis:

1. testing for LMS with human capital models given a priori segment determination
2. factor analysis
3. cluster analysis and
4. switching regressions

4.2.1. Human capital models — a priori segment determination

Human capital theory emphasises worker heterogeneity, including differential investments in human capital, rather than differences among jobs, as the primary cause of wage differentials. What this implies is that low wage jobs consist of low productivity workers who are unable or unwilling to obtain the necessary skills which would allow them to access higher paid jobs. Hence poverty could be eliminated by investment in human capital through training programmes which would provide individuals with more skills or with incentives to obtain more skills.

In contrast, the SLM theorists have maintained that jobs can be roughly divided among those with low wages, bad working conditions, unstable employment and little opportunity for advancement (secondary jobs) and those with high wages, good working conditions and opportunities for advancement into higher paying jobs. As a result it is suggested that the mechanisms governing wage and employment determination differ among the segments. In particular, while the
secondary labour market has completely flat low wage profile, the primary market has a wage profile similar to that predicted by the human capital theory. The inadequacy of human capital investment in the secondary segment is one hypothesis that is common to all versions of segmentation theory.

Researchers have attempted to test directly the hypothesis that the wage-setting mechanisms are different among labour market segments by predetermining the number of segments in the labour market on the basis of the characteristics of the jobs or of the industry and thereafter testing for differences in the wage equations for each segment. The basic analytical tool in these studies is an augmented classic human capital earnings function. Regression analysis is employed to examine differences in the wage determination process in the two labour market sectors and separate earnings functions are estimated for each segment.

A favourable result to the segmentation hypothesis would be that human capital related variables perform considerably less well as explanatory variables in secondary labour markets. However, considering that a segmentation design, derived by using firms, industries or occupational characteristics, might produce different results, we shall test two different dimensions of the theory: industrial duality and occupational segmentation.

4.2.1a. Industrial duality

Under this version of segmentation, the starting point for differentiation in the labour market is the nature of demand for employee services; in other words, the industrial structure. Those who focus on industrial structure (e.g. Buchele, 1983; McNabb, 1987; Osberg et al., 1987; and McNabb and Ryan, 1990) emphasise the importance of variables such as technology, unionisation, organisational structure, nature of product demand and size; placing therefore, the industry under the focus of investigation rather than the particular employment or establishment.

Osberg et al. (1987) estimated wage equations for both the labour market as a whole and six segments of the labour market determined a priori. Having tested and rejected the idea that the two most popular specifications of a human capital type wage equation, the quadratic and ‘Gompertz’, are equally good explanations of the wage determination process within different segments of the labour market, they demonstrated that when separate regressions are run for separate segments of the labour market the human capital model fits the data quite well in some segments and quite poorly in some others.

When alternative hypotheses were tested against the most popular operationalisation of the human capital hypothesis, the conclusion for roughly half the labour force, segment 1 to 4, was that those alternative hypotheses should be preferred to a human capital specification of the wage equation. Indicatively, for the core industry segment, the two competing hypotheses are as follows:

\[
\begin{align*}
\ln W_g &= a + b_1 S + b_2 T + b_3 T^2 + u \\
\ln W_g &= a + b_1 S + b_2 BOSS + b_3 EMP + u
\end{align*}
\]
where:
\[
\ln W_g = \text{natural log of hourly wage rate}
\]
\[
S = \text{years of education}
\]
\[
T = \text{wage} - S - 5
\]
\[
BOSS = \text{number of employees supervised}
\]
\[
EMP = \text{years of continuous employment with current employer (tenure)}
\]

Equation (2) supports the internal labour market hypothesis which suggests that wages are characteristics of jobs and that individuals move up job hierarchies as they gain seniority with firms.

The results do not necessarily reject the human capital theory. Although they indicate that some form of segmentation exists, certainly not strict duality, emphasis is placed on the fact that high-wage and low-wage sectors are themselves aggregates of quite dissimilar segments. Hence within both sectors there may exist segments within which the human capital estimating equations perform rather well. This explains why some other authors have, when testing simple dualistic models, found human capital explanations convincing for wage determination within both the high-wage and low-wage sectors, (e.g., McNabb 1987; Psacharopoulos, 1978; and McNabb and Psacharopoulos, 1981).

In the British context, McNabb (1987) set out to test for strict industrial dualism by estimating separate earnings functions for primary and secondary sector workers. The sample was divided a priori as indicated in the previous section.

\[
\ln W = a_0 + a_1 S + a_2 EXP + a_3 EXP^2 + a_4 OCCUPN + a_5 \ln WKS + u \quad (3)
\]

where:
\[
W = \text{annual earnings}
\]
\[
S = \text{years of formal schooling}
\]
\[
EXP = \text{years of work experience}
\]
\[
OCCUPN = \text{occupation in which individual is employed}
\]
\[
WKS = \text{weeks worked per year}
\]

The results show that schooling and work experience are highly rewarded in both sectors. Indeed there is evidence that periphery employers may place a higher premium on human capital. Moreover, although the importance of workers’ positions in the occupational hierarchy is confirmed as the main factor affecting their level of earnings, differences in education and experience account for a higher proportion of the explained variations in earnings than occupation.

Therefore, McNabb’s findings led him to conclude that it is education and work experience that have the greatest explanatory power with respect to earnings differentials rather than industrial affiliation. ‘…there is no support for the dominant role given in the segmentation theory to industrial attachment in
determining individuals earnings inequality and the hypothesis that industry-specific factors give rise to significant differences in the way earnings are determined’ (McNabb, 1987, p. 271).

4.2.1.b. Occupational segmentation

The failure to establish highly significant results in favour of strict industrial duality made researchers reconsider the assumption that ‘good’ and ‘bad’ jobs are synonymous with ‘core’ and ‘periphery’ sector industries. The weakness of the above approach lay in the tendency of individual employers to segment their own forces into ‘good’ and ‘bad’ jobs. As a result LMS studies moved away from industrial demarcation to an examination of the jobs themselves, i.e. occupational segmentation.

Osterman (1975) estimated three earnings equations; one for each of his three arbitrarily predetermined segments. The equations are:

\[
\ln E = b_0 + b_1 A + b_2 A^2 + b_3 Ed + b_4 R + b_5 U + b_6 H + \sum_{i=1}^{30} b_i I + e
\]

where:

- \( E \) = annual earnings
- \( A \) = age
- \( A^2 \) = the quadratic form provides the best representation of the rising and levelling-off age-earnings profiles
- \( Ed \) = years of school completed
- \( R \) = race (1 if white, 0 if black)
- \( U \) = weeks unemployed previous year
- \( H \) = hours worked previous week
- \( I \) = fourteen dummy variables for the industry in which the individual worked (1 if in that industry, 0 if otherwise)

Osterman’s results indicate that earnings in both primary segments are more systematically determined with almost all variables being significant, while differences exist in the magnitude of the variables’ effects; for instance, higher returns to education are present in the upper primary segment. However, the results for secondary occupations indicate that earnings tend to be influenced only by the time spent unemployed and the number of hours worked per week, which are shown to be significantly negatively and positively different respectively from the comparable coefficients in the other sectors. This supports the view that employers regard workers hired to secondary jobs as largely interchangeable.

Moreover, race appears to be a significant factor in the lower primary segment which is interpreted by Osterman as being the result of institutional constraints present in this tier which permit racial discrimination. Whereas, in the upper primary segment wages are set primarily on the basis of human capital investment and in the
secondary segment as a result of perceived homogeneity. When the same equations were run separately for both black and white workers, to control for pre-market discrimination, the results remained the same. Osterman’s results therefore, imply that wage differentials may exist across segments for labour of comparable quality indicating thereby the existence of occupational labour market segmentation.

A similar technique however, used in Britain by Psacharopoulos (1978) and McNabb and Psacharopoulos (1981), failed to produce evidence in favour of the existence of LMS and in particular labour market duality in the UK. Psacharopoulos (1978) employed only a simple Mincerian human capital model and having used the Hope-Goldthorpe occupational rating scale to determine sector attachment he failed to find any conclusive evidence of differences in the determination of earnings between the two segments.

McNabb and Psacharopoulos (1981) analysed the same sample as the one used in Psacharopoulos (1978) using augmented classic human capital earnings functions for the entire sample and then separately for the primary and secondary segments. The hypothesis that all coefficients for both segments are equal was rejected, indicating that the determination of earnings may differ between sectors. However, the relationship between income and education and experience in both sectors was positive and significant, although of a lower magnitude in the secondary segment. Also, counter to the demand-side emphasis of the segmentationalist literature, most industry dummies turned out to be significant. Therefore, all the results can easily be interpreted as evidence against labour market duality in the UK.

Following McNabb and Psacharopoulos, Neumann and Ziderman (1986) used data drawn from the Israel Labour Mobility Survey and estimated the same Mincerian type human capital earnings function for the primary and secondary sectors of the Israeli labour market separately. The results were highly supportive of the dual labour market hypothesis. Lack of significance of the human capital coefficients in the secondary segment confirmed the idea that human capital investments do not contribute to earnings augmentation in secondary markets.

Apart from their obvious inconclusiveness the previous studies suffer, each to a different degree, from a series of methodological flaws. Although there is now a substantial literature on LMS, its major weakness is attributed to definitional problems relating to the construction of labour market segments as well as to the unsatisfactory nature of many of the tests conducted.

4.2.1.c. Truncation bias

The major problem which permeates most hypothesis testing of segmentationalist theory is the process of segment delineation. So far in our analysis, most studies have used a priori classification systems, failing thereby, to account for the endogeneity of an individual’s labour market segment. This was Cain’s (1976) main criticism of this kind of work. He criticised the technique of dividing the labour force into high and low wage segments and then regressing earnings on
education and other human capital variables. He argued that arbitrarily dividing a single market into high and low wage segments would create a truncation bias.

The effect of truncation occurs when sample data are drawn from a subset of a larger population of interest. Boston suggests that ‘…censoring and truncating of segments occurs when definitions are used that fail to include observations above a floor or below a ceiling or when observations are eliminated from a sample.’ (Boston, 1983, p. 101) By this he means that one would observe, for example, in the low-wage segment only those highly educated people whose unobserved low ‘ability’ placed them below the expected earnings for their schooling level. Hence the return to schooling would appear low for this group.

Testing for both industrial dualism and occupational segmentation are subject to this. The a priori determination of industrial sectors or the arbitrary demarcation line drawn between good and bad jobs will bias returns to human capital. As pointed out by Cain it is not very surprising that the effect of schooling on earnings is lower in the lower segment since the high values of the dependent variables are cut off (figure 1).

Psacharopoulos (1978) criticised this approach on the grounds of circular reasoning. What he meant is that if a segment is defined on the basis of pay levels it is a circular argument to claim that the secondary segment has low pay. To that effect he argued that splitting the sample into two segments is equivalent to standardising for occupation, since irrespective of the split criterion highly paid

![Figure 1. Truncation bias](image-url)
occupations are bound to be clustered in the upper segment and lower paid occupations in the lower segment. The correlation between earnings and segment types would therefore, result in a higher regression slope in the primary segment. Hence: ‘Standardising for occupation in an earnings function underestimates the return to schooling as it denies the effect of schooling on earnings via changes in occupations.’ (Psacharopoulos, 1978, p. 428–29)

In the SLM literature, Harrison (1972) fits his regressions separately for ghetto, or low-income-area, residents and so effectively truncates on earnings. Osterman (1975) assigns jobs into three sectors on the basis of their typical characteristics in the literature, which, among others, include low wages; thereby leaving his study open to the criticism of truncation bias. Whereas, McNabb (1987) determines segments on the basis of the proportion of females employed in the industry, which could be interpreted as indirect truncation bias since women tend to be paid less.

In response to the serious criticisms outlined above, most researchers offer different solutions in order to avoid truncation bias. Mayhew and Rosewell (1979), McNabb and Psacharopoulos (1981) and later Neumann and Ziderman (1987) used an occupational cut-off criterion, namely the Hope-Goldthorpe occupational rating scale, to define segments. This scale is not constructed by direct reference to income and education which implies that to a large extent it avoids truncation bias.

Others tried to avoid truncation bias by using different cut-off criteria. Osberg et al. (1986) defined labour market segments with reference to the major product market of the employing establishment; a criterion logically distinct from pay levels. While, Rumberger and Carnoy (1990) and Boston (1990) used information on the specific training requirements of jobs to define labour market segments. In this way each segment included workers irrespective of their earnings or, in Boston’s case alone, of job related attributes.

Finally, Dickens and Lang (1985) have implemented a technique which allows one to estimate the wage equation for unobserved sectors simply by postulating the number of sectors and the determinants of sector attachment. This is the method known as switching regressions which we shall analyse in detail in section 4.2.4.

4.2.1.d. Sample selection bias

Heckman (1979) defines sample selection bias as ‘…the bias that results from using selected samples to estimate behavioural relationships…’. He describes two possible sources for it: first, the existence of self selection by the individuals being investigated and second the selective nature of decisions taken by analysts or data processors with regard to data collection. In our case, dividing the sample on the basis of occupation or industry can have serious consequences for the estimation of earnings equations. In particular, since a worker’s choice of industry or occupation is not independent of unmeasured characteristics, there exists the danger of sample selection bias.
Heckman and Hotz (1986) used an a priori classification to divide their sample into two groups: one consisting of individuals whose annual income fell below the poverty level and one consisting of those above the poverty level. Thereafter they corrected sample selectivity by using Heckman’s (1979) two-step procedure which translates the problem of income truncation into a problem of omitted variable bias, such as ability or motivation.

Theodossiou (1990) used Lee’s (1978) two-step procedure to correct for sample selectivity in estimating a simple career model. Following Okun’s analysis of career labour markets, he split the sample into career and non-career sectors on the basis of a variable describing the career prospects open to an individual worker and estimated two earnings equations for career and non-career workers respectively:

\[
\ln E^c_i = b_0^c + b_1^c X_i^c + b_2^c Z_i^c + e^c
\]

\[
\ln E^n_i = b_0^n + b_1^n X_i^n + b_2^n Z_i^n + e^n
\]

where:

- \(X_i\) are variables describing individual characteristics
- \(Z_i\) are variables describing jobs and industry characteristics.

Both earnings equations in this model appear to be mispecified since it was assumed that the effects of personal job and industry characteristics on wages were independent of the career status of the employee. Correcting for sample selectivity bias therefore, means abandoning an ordinary least squares (OLS) estimation in favour of a bivariate probit model since:

\[E(e^c | Cs_i > 0) \neq 0 \quad \text{and} \quad E(e^n | Cs_i \leq 0) \neq 0\]

Osberg et al. (1987) examined another aspect of sample selectivity bias. In deciding whether to change jobs, individuals compare the monetary and non-monetary attributes of their current jobs with those of the jobs they could get. However, only the ‘moving’ wage for those who actually move and the ‘staying’ wage for those who actually stay can be observed. Job mobility and wages are thus simultaneously determined.

Again the two-step Heckman procedure was employed to correct for sample selectivity bias. The results not only showed supporting evidence of the dual labour market hypothesis, but also that one could go very wrong in estimating the determinants of individual wages for workers in the ‘marginal’ segment of the labour market by ignoring the returns to job mobility.

4.2.2. Factor analysis

Factor analysis is a statistical technique which is used in order to discover underlying patterns in the data. This allows a reduction in the number of variables under consideration by identifying a relatively small number of factors that can be used to represent complex relationships among sets of interrelated variables. Each factor is a composite variable and its interpretation is suggested by the set of the
original that ‘load high’ (either positively or negatively) on it. The basic factor analytic model is of the form:

\[ X_i = a_{i1}F_1 + a_{i2}F_2 + \ldots + a_{im}F_m + e_i \]

where:

- \( X_i \) are \( n \) standardised variables described linearly in terms of \((m + 1)\) underlying factors: \( m \) common factors and a unique factor \( e_i \) associated with the \( i \)th variable; \( a_{im} \) are the constants used to combine the \( m \) common factors.

Factor analysis is a technique for testing strict industrial dualism. Ideally if data are consistent with an interpretation of the labour market in terms of strict duality, i.e. a core/periphery type distinction, a common factor would be identified that separates individuals into these two distinct groupings. This factor should load high on those dimensions of industrial structure, e.g. technology, concentration, capital intensity etc., discussed in the dual economy literature.

The next step of the analysis involves computing ‘factor scores’ for each industry. An industry’s factor scores are therefore, computed from a factor-score coefficient matrix and the frequency distribution of those scores is examined in order to ascertain whether it is consistent with the hypothesis of dualism. Some researchers have indeed found a dominant factor fitting the dual market typology and have also found bimodal distributions of factor scores.

Oster (1979) used factor analysis of data for 83 3-digit 1960 Census code industries to test for strict industrial dualism. Factor loadings were estimated but only the first three principal factors were taken into consideration\textsuperscript{15}: I) a tentative dual economy factor II) a sex factor and III) a race factor. However, neither factor II nor factor III captured the kind of differences among industries proposed by the theory of dual economy. Only factor I loads significantly and with the hypothesised signs on all those variables, such as establishment size, total industry receipts concentration etc., that reflect a core-periphery pattern of stratification.

Moreover, following Pearson’s method, Oster fitted the distribution of values of factor I to a mixture of two normal distributions. The proposition that the sample distribution was generated by a mixture of two normal probability density functions (PDFs) could not be rejected. Hence the hypothesis of a dual economy was supported. However, although Oster’s technique managed to confirm the hypothesis of structural dualism without resorting to arbitrary assignation of jobs or individuals to the two sectors, no test to affirm or reject the dual labour market hypothesis was conducted.

Dual labour market theory suggests that large industries with high capital intensity and product market concentration have lower rates of separation and unemployment. (Edwards, 1975) Four different measures of employment stability were used as dependent variables while independent variables included a dummy to indicate employment in the core or periphery, and a number of variables describing personal characteristics and job requirements to control for human
capital effects. The results were robust, confirming the hypothesis that core industries are characterised by greater employment stability and thereby accepting the dual labour market hypothesis.

In Britain Sloane et al. (1993) used data drawn from the Social and Economic Life Initiative (SCELI) which covered six local British labour markets in 1986 and 1987 (Aberdeen, Northampton, Swindon, Kirkcaldy, Coventry and Rochdale). Their model identified four important factors reflecting human capital characteristics, job stability characteristics of individuals, industry effects and the composition of the workforce. Having identified the factors they then proceeded to estimate human capital earnings functions separately for each group with high and low scores on each factor. Generally their results suggested that the labour market was basically homogeneous.

Although factor analysis has attempted to overcome the problem of arbitrary assignation of jobs or individuals to the labour market segments, it is still used to test only strict duality. However, labour market segmentation may not necessarily imply pure dualism as several studies indicated. Moreover, the interpretation of factors is subjective and not testable statistically. Researchers have to rely heavily on the dual economy literature to get guidance with regard to expected loadings for variables which can be problematic when these are not central to most descriptions of core and periphery industries. Furthermore, bimodality established in such studies refers to product-market attributes rather than to labour market outcomes. McNabb and Ryan (1990) argue that: ‘…the labour market consequences of bimodal duality have been limited to differences between earnings or turnover in the two segments. No one has established the existence of a bimodal duality in pay or turnover parallel to that in industrial characteristics…’ (p. 169)

Nevertheless, failure to establish strict duality does not mean that one should throw the labour market segmentation theory out with the bath water. The next two techniques may reveal a better insight of the theory.

4.2.3. Cluster analysis

Cluster analysis is a method of assigning occupations or employees into relatively homogeneous groups with respect to a given set of variables. It therefore provides a means for drawing together the full set of job characteristics that are presumed to define segment boundaries. It is purely a statistical method which implies that specific hypotheses cannot be tested. Nevertheless, its major advantage is that it can determine into how many clusters the observations fall naturally, without forcing the data into a predetermined number of segments.

In addition to this, cluster analysis can also provide information on the distance between clusters or segments. This allows one to delineate tiers more easily within segments and identify any ‘outliers’, i.e. occupations which are particularly dissimilar to others. Also, by using cluster analysis one can present and measure the degree of earnings dispersion without necessarily forcing the results into a strict duality structure (Ryan, 1981).
In Australia, Flatau and Lewis (1993) found evidence of distinct segments within the workforce but ruled out strict duality. Their results suggest that occupations cluster into three distinct groups; ‘secondary’ ‘intermediate’ and ‘primary’ sectors with tiers within the primary sector. They argued that: ‘…defining labour market segmentation in terms of wages alone or some other single attribute is fraught with difficulties because of the lack of correlation between these characteristics. Only by considering the multidimensional aspect of job characteristics and distinguishing between communality of factors can segmentation be analysed.’ (p. 293)

Drago (1992) used cluster analysis in conjunction with the segmentation model of Gordon, Edwards and Reich (1982), which described labour segmentation on the constructs of ‘class conflict’ and ‘divide and conquer’, to allocate a sample of Australian workplaces among the primary independent, primary subordinate and secondary segments. Although his results do not mirror those of Gordon Edwards and Reich (GER) the cluster analysis was consistent with the assertion that such segments exist and the evidence generally supported the view that Australian firms have used segmentation as a tool to divide and conquer their workforces. In particular, what are considered the three key indicators in the GER model, i.e. internal promotion systems, on-the-job training and unexplained wage differentials among workers of comparable quality, perform as expected.

The primary independent segment is characterised by skilled white collar employees with high incomes and internal promotion opportunities. The workplaces are most likely to be owned by large multinationals which recruit employees from ILMs and attempt to generate worker loyalty through wage inequality and non-pecuniary awards. The primary subordinate segment is mainly blue collar, heavily identified with manufacturing, mining and construction and exhibits characteristics such as lengthy job tenure and on-the-job training. Finally the secondary segment includes small periphery firms which offer low pay, little training and limited promotion opportunities. Not surprisingly employees exhibit high turnover rates and job tenure is usually short.

In the US Anderson et al. (1987) used cluster analysis to construct clusters in a free manner, i.e. without imposing any beliefs stemming from the segmentation theory, on the process. Their results showed no sign of dual or SLM. Boston (1990) on the other hand, used cluster analysis to partition markets in accordance with dual labour market considerations in collecting his variables. Following Ward’s method, which uses a stopping criterion of two clusters, he found a theoretically appealing clustering of occupations into two sectors, a primary and a secondary sector, separated by race and gender. Thereafter, running human capital regression for each of the four groups he concluded that 15% of the earnings differential was unexplained, which led him not to reject the hypothesis that primary sector workers receive wage premiums.

In Britain, Sloane et al. (1993) constructed clusters using variables which also provided a reasonable representation of the various dimensions of labour, market segmentation. The algorithm revealed two segments of roughly the same size but their characteristics were not in line with the segmentation hypothesis. While
segment 1 consisted of ‘core’-type firms, they appeared to be more reliant on the use of casual labour, placing thereby aside the ILM market hypothesis. Moreover, after applying a human capital model to each segment no high-wage low-wage dichotomy was revealed.

What the above evidence indicates is the fact that although cluster analysis solves the problem of a priori segment determination, the results are highly dependent upon the number or type of variables used to determine the clusters and the kind of algorithms used.

4.2.4. Switching regressions

So far the statistical and econometric techniques used for testing the segmentation hypothesis have proven to be fraught with problems and flaws, mostly related to the accurate delineation of labour market segments. As noted earlier, the starting point for any analysis of the segmentation hypothesis is to estimate separate earnings equations for each labour market sector. However, the main difficulty in specifying wage equations for each sector is that no prior information exists on the assignment of individuals to these sectors. Thus it is appropriate, if possible, to treat sectors as unknown.

In a series of papers Dickens and Lang (1985, 1987a&b, 1988a&b, 1992a&b) have implemented a technique which allows one to estimate the wage equations for unobserved sectors; that is a switching regression model with unknown regimes. This technique enables one to derive the probability of sector attachments directly from the observed distribution of wages and worker attributes and thereby resolves the problem of attributing primary or secondary sector employment to everyone in a given industry or occupation.

To implement the switching regression model, Dickens and Lang (1985) specify two wage equations and a model explaining the probability of sector attachment, and estimate all three equations simultaneously. (See Appendix ) ‘The main question is: do two wage equations fit the data significantly better than one and do the best-fitting equations fit the predictions of the dual labour market hypothesis?’ (Dickens and Lang, 1985, p. 794) The above hypotheses can easily be tested by comparing the log likelihood values for the two models since the single equation model is nested in the switching model.

Dickens and Lang (1985, 1992b) estimated an OLS wage equation for the whole labour market and the dual labour market model as described in the appendix. All the results for the OLS model were similar to those obtained by other researchers and the primary sector wage equation resembles the OLS equation. In particular, the returns to schooling and experience are quite high, while no race differential appears to exist.

However, the results from the secondary sector wage equation appear to contrast sharply with the OLS equation. That is, the secondary sector wage equation is almost everywhere below the primary sector, while the returns both to experience and schooling are essentially zero. Moreover, the likelihood ratio test with a chi-squared statistic of 177 shows that we can reject the single labour
market (OLS) model at any conventional level of significance (at 1% level of significance the critical value is 29.14). This implies that the two equations fit the data better than one and hence, the prediction of labour market duality, that are no returns to education or experience in the secondary sector cannot be rejected.

However, criticisms of the simplicity of the OLS model with regards to the existence of possible non-linearities in the explanatory variables and heteroscedasticity of the error term, led the authors to reconsider the evidence and subject it to further tests. (Dickens and Lang, 1987a) Again the dual labour market model outperformed a complex single labour market model and ‘passes’ a goodness of fit test.16 However, the dual labour market model cannot account for certain spikes in the wage distribution and hence Dickens and Lang argue: ‘…we do not propose that the labour market consists of exactly two distinct segment. Only that dualism is a useful simplification.’ (Dickens and Lang, 1988a, p. 131)

Nevertheless, considering the overall remarkable consistence of their findings with the DLM typology, Dickens and Lang applied the switching equation technique together with the information on the individual wage to sort individuals into primary and secondary sectors. They argued that earlier a priori classification systems appeared to have missclassified many workers for two reasons. First, because even within the same firm there may be both primary and secondary workers. The concept of the flexible firm implies duality within an enterprise, with a ‘core’ and a ‘periphery’ workforce.17 And second because classification systems based solely on industry will disagree considerably with those based solely on occupation since many occupations are common to many, if not all, industries.

Using a large data set18 and having estimated the wage equation, they then recomputed the probability that each individual was attached to the primary sector. Their results were substantially in accord with descriptive work on the dual labour market. There was however, one caveat. None of the industries or occupations examined can be identified as being entirely secondary. It appears that primary workers may exist even in those industries or occupations which are substantially secondary.

Hence, it is suggested that the varying degrees of inaccuracy inherent in an a priori system of classification may be the reason for the inconsistency of results across different studies.

4.3. Mobility

So far the central hypothesis examined in this study has been that different reward and incentive systems exist across the segmented labour markets for otherwise comparable individuals. Several authors have suggested that the mere existence of distinct wage equations for the primary and secondary sectors would indicate a refutation of the human capital theory. (Osterman, 1975, Buchele, 1983)

However, in order for differential reward mechanisms to exist across sectors, labour mobility must be limited. Otherwise sectoral convergence would occur as firms and workers bid away systematic sector differences. Dickens ad Lang have noted that: ‘…if an individual can move out of the secondary sector in order to
obtain returns on experience and education, the existence of a sector in which there are no returns is inconsequential (Dickens and Lang, 1985, p. 793). Hence, the important question to be examined in this section is: are primary sector jobs rationed?

The issue of mobility has been central to the SLM literature. The proposition that the poor are confined to the secondary segment constitutes the most fundamental criticism of human capital theory because it implies that labour markets do not clear; that is access to some sectors is subject to non-price rationing. In dualist studies, both in the US and in the UK, several authors have addressed the issue of mobility between the two sectors. More significantly, they argued that there is a hierarchy of sectors with access to the highest paying being the most difficult. However, once more the results are highly contradictory in some cases.

For Britain, Psacharopoulos (1978) examined the crucial issue of mobility by analysing data relating to 6,873 male employees obtained from the 1972 General Household Survey. An age-occupational scale profile was constructed to analyse intra-generational socio-economic mobility, while inter-generational mobility was examined through the use of a mobility matrix constructed on the basis of the Hope-Goldthorpe scale for the jobs of employees and their fathers.

In the first case, the evidence showed the existence of a normal career pattern, where workers initially take less desirable jobs upon entering the labour force and later progress by obtaining better jobs. In the second case, although a fair amount of occupational transmission between generations is present, some upward mobility exists too. With almost as many workers moving upwards as those who remain in the lower segment, significant amounts of mobility out of low-level occupations was found to be associated with higher levels of schooling. Hence, Psacharopoulos concludes that all of his tests fail to support the hypothesis that the UK labour market is segmented.

Mayhew and Rosewell (1979) used the 1972 UK Oxford Mobility Survey to test for a ‘strong’ version of the SLM hypothesis, where there are specific identifiable segments between which lifetime mobility is severely limited. They constructed a mobility matrix based on a maximum of four possible jobs for any individual male worker and following Osterman (1975) they assigned individuals to one of the three segments, upper primary, lower primary or secondary, on the basis of occupational status.

Like Psacharopoulos, they found evidence of both upward and downward mobility but the vast majority of individuals remained in their staring segment indicating substantial inter-sectoral immobility. Moreover, human capital variables such as education, experience and age appeared to be important determinants of both initial allocation among and upward mobility between sectors. Access to higher positions in the occupational hierarchy is correlated with the level of education of workers. This finding was also reported later by McNabb (1987) who along with Mayhew and Rosewell concluded that the UK labour market does not suffer from the rigid immobility endorsed by segmentation theory: ‘…while increased schooling may not lead to increased earnings within
semi- and unskilled occupations and in personal service jobs, high levels of schooling can enable workers to move up the occupational hierarchy into jobs that offer higher average earnings’ (McNabb 1987, p. 270).

Although the above studies clearly indicate the superiority of the human capital model in explaining the significant amounts of lifetime mobility out of low level occupations, it must be remembered that they are only examining observations on white males and are unable to analyse the impact of race and gender. Further analysis is therefore required before certain conclusions are reached.

In the US several early studies presented evidence with regards to inter-sectoral mobility, which refuted the dual market hypothesis. Leigh (1976) reported substantial and comparable earnings growth for both blacks and white males, while Schiller (1977) reported extensive upward mobility of individuals at the bottom of the income distribution during the period 1957 to 1971 and attributed high immobility rates for blacks solely to discrimination.

Other writers however, argued that this differential mobility supports the DLM theory. Rosenberg (1980), despite accepting that ‘the secondary segment is not airtight’, also found that human capital variables do not explain the upward mobility of minority workers. Carnoy and Rumberger (1980) used both occupational and industrial divisions of the US labour market to examine mobility between segments for whites and blacks and also those individual characteristics which contribute to mobility.

Their results indicate that more upward mobility exists in general than downward mobility. Yet, racial differences are obvious. Black males were less upwardly mobile for secondary jobs than whites. They were more likely to begin their career in the secondary sector and having done so they were less likely to move than were whites. Overall, the patterns of mobility for whites were much more affected by schooling, age and marriage whereas, the effect of vocational training was universal.

Boston (1990) took a step further and examined the inter-sector mobility of workers between 1982 and 1983 by race and gender. He discovered that both white men and women, although surprisingly enough women more that men, experience greater upward mobility than black men and women. Moreover, the age-cohort profile of secondary sector workers corresponded to the SLM hypotheses. That is, while a very high percentage of young workers start their careers in the secondary sector, a disproportionate number of older black workers ‘get stuck’ in secondary sector occupations. A logit equation employed to identify attributes associated with upward mobility revealed that education has the largest positive effect and being black has the largest negative effect.

Although studies of differential mobility between races are suggestive, dual labour market theory maintains that individuals cannot always choose the sector which they prefer to be employed in. Some workers would prefer primary sector employment but cannot find jobs there. Measuring mobility therefore, does not provide a test of rationing of primary sector jobs. Dickens and Lang (1985, 1992b) using switching regression analysis, tested the presence of non-economic barriers to primary sector employment.
First, they postulated a mechanism for allocation of workers between the sectors in the absence of rationing based on workers free employment choices. Assuming that workers have perfect information and would behave so as to maximise utility over their lifetime, then they would choose primary sector employment if the net present value (NPV) of their income stream in the primary sector exceeded that of the secondary sector. To model this they tested a series of constraints on the switching equation.

If the hypothesis of workers’ free choices of sectors is to be accepted, and tastes for the non-pecuniary aspects of employment were not related to certain individual characteristics such as her place of residence, her marital status, education or race, then it would be expected for the coefficients of the variables describing these characteristics in the switching equation (see appendix) to equal the coefficients in the two wage equations. However, since assumptions like the above, with regards to workers’ preferences, are highly unrealistic further testing shows that the hypothesis of free choice is easily rejected. Dickens and Lang are thus driven to conclude that blacks are discriminated against when seeking primary employment.

While this model appears to be compatible with the theory of queues the evidence suggests that rather than allocating jobs randomly, primary sector employers discriminate against blacks. However the relation of labour market segmentation to race discrimination is not considered in this study.

5. Conclusions
This paper has examined whether the theory of labour market segmentation could be considered as a possible valid alternative to the neo-classical analysis of labour markets. The main argument in the labour market segmentation approach is usually presented as a conflict between the SLM theorists and the neo-classicals regarding the existence or otherwise of labour market segmentation. However the reality is far more complex.

Classical theorists themselves accept that labour markets are segmented but not to the extent or for the same reasons put forward by the segmentationalists. In classical models geographical and biological reasons, especially age, cause labour inputs to be imperfect substitutes for each other. In addition labour market institutions, such as labour unions, and government laws, such as minimum wage legislation or laws on in-migration, also cause market segmentation. While in the former case individuals are differentiated by their different attributes in the latter, segmentation emerges essentially as a consequence of wage rigidity.

The above contrasts sharply with the notion of ‘good’ and ‘bad’ jobs which permeates the SLM literature. Workers with, at least initially, similar skills are arbitrarily allocated to different quality labour market sectors; those containing ‘good’ jobs and those containing ‘bad’ jobs. Thus the observed wage differentials are not the result of underlying skill differentials but of certain institutional rules and social influences.

It can be argued therefore that the labour market is segmented and this is an established fact. What still remains to be proven though is along what lines. What
this paper has shown is that even the most enthusiastic proponents of the SLM theory have failed so far to develop explicitly a concise methodology capable of validating their arguments, in particular, with regards to the issue of mobility, which has been central to the SLM literature.

What most of the empirical studies examined here have in common, is that they test for the strong version of the segmentation theory which is the dual labour market hypothesis. Their weakness is that they presuppose the number of segments that exist in the labour market. However, even those which do not make the dualist assumption produce unreliable results. As we have seen using a priori segment determination methods, or factor analysis the results become highly varied. The number of segments in the market varies from two to six. Cluster analysis may solve the problem of segment determination but then the results are again highly dependent upon the number or type of variables used to determine the clusters and the kind of algorithms used.

In Britain tests both for different wage structures among labour market sectors and the mobility of workers among those sectors, produce inconclusive results. However state-of-art econometric techniques such as switching regressions have provided clear evidence of labour market segmentation in the US. The question over the precise segment determination still remains unanswered though, since even this technique is based on labour market duality.

Because the segmentationalists have not been able to develop either a clear theory or methodology which consistently produces a specific number of segments or convincing criteria for determining the type of segments or the features that differentiate those segments, they have not effectively taken us any further than the classicals did. That there exists a degree of segmentation in the labour market.

The proposition that the poor are confined to the secondary segment, which has been central to the SLM literature, constitutes the most fundamental criticism of human capital theory because it implies that labour markets do not clear. However, the theory remains weak since neither the causes of immobility barriers nor the reasons for secondary workers’ entrapment have yet been established empirically. That there is some degree of occupational immobility is well known. (Thurow, 1970; Okun, 1981; Pigou, 1945; Mill, 1909) It would therefore, be important for future research to deal with the issue of labour mobility among sectors: Is it possible to divide the labour market into a number of different segments between which labour mobility is restricted? Can the allocation of individuals or occupations into these segments be predicted from a set of variables which are interesting for matters of economic policy? The outcome of a research programme attending to answering these questions can determine the relevance of a strong version of the SLM approach.

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Notes

1. The SLM approach is in direct conflict with Adam Smith’s concept of compensating differentials. In his theory, bad jobs should be paid more, ceteris paribus.

2. The seminal work in this literature is that of Doeringer and Piore (1971) and Gordon and Harrison (1972). The literature through 1975 was surveyed by Cain (1976) and subsequently by Wachter and Taubman (1986).

3. More formal human capital theory has adopted a similar concept to that of a ‘career ladder’. In particular, Lorne Carmichael (1983) defines a ‘promotion ladder’ as ‘…the arrangement that offers a fixed number of high wage jobs to trained workers on the basis of their seniority level.’ The article thereby argues that the optimal labour contract controlling turnover in the presence of investments in specific human capital would be the one which offers a promotion ladder to the trained employee.

4. Neo-classical economists have only indirectly examined the ILM structure by concentrating on analysing separately a number of phenomena which have been associated with it and which distinguish it from wage competition. Prime examples of these constituents parts which are analysed in isolation are reduced turnover, job attachment, internal promotion, rent sharing and seniority. (Parsons, 1986) As a result, although the distinction between a firm’s internal market and competition among firms is not alien to human capital theory, this form of neo-classical reductionism is in direct contrast with the holistic approach of the institutional analysis of the ILM which was most fully developed by Doeringer and Piore (1971). The latter has changed the focus of much of the labour market analysis in that it has opened up the ‘black box’ of the employing organisation which in neo-classical theory still remains the domain of industrial sociologists and industrial organisation theorists. SLM theory differs from the neo-classical paradigm in that in examining the workings of the labour market, the former does not ignore the internal workings of employing organisations as the latter tends to do.

5. This term was used by Edwards (1975) to refer to the institutional arrangements governing production. The social relations of production embody elements of power and control such as sanctions, incentives, distribution of responsibilities and other apparatus by means of which power is exercised and are essential in explaining the market process. ILMs are created as part of an effort to alter the social relations of production within large firms.

6. See Edwards (1972) for a more detailed analysis of the ‘bureaucratic control’ system.

7. It would be expected that earnings in the non-career sector would be little influenced by individual capabilities, experience and training, unlike the earnings of individuals in the career sector. ‘…The pure case of a casual labour strategy would involve zero screening and training expenditures … it would offer a single wage rate to all workers regardless of tenure with the firm; … [and] because high pay represents a return to some differential skill or attainment on the part of workers, the unsorted casual workers are bound to be paid low wages. They are stuck with ‘dead-end’ jobs, which are nonetheless their means of livelihood. The firm with a casual labour strategy must expect high cyclically sensitive quit rates; its workers will have no inhibitions about quitting to obtain more favourable opportunities as they arise elsewhere in the labour market. …’ (Okun, p. 82)

8. Two separate criteria can be used for segmenting the labour market in line with Okun’s CLM theory. The first criterion relates to a worker’s career prospects. That is, given the requirements of the ‘toll’ model, firms in the career sector are expected to pay high wages to valuable workers to achieve long attachments and thereby amortise the toll incurred by the firm in hiring the particular employee in the first place. The same firms are not expected to do so for easily replaceable workers in the non-career sector though. The second criterion relates to the amount of on-the-job specific training that the individual workers are offered by their employers in the career labour


10. For an exposition of the relevant human capital earnings functions see Mincer (1974).

11. There are alternative assumptions, different from Mincer’s, that lead to different empirical formulations of the human capital model, and hence the choice of functional form ought to be made on an empirical basis rather than a theoretical one, (Blinder, 1976).

12. ln $Y - a + bS + cEX + dEX^2$ where: $Y$ = annual earnings, $S$ = completed years of schooling and $EX$ = experience.

13. The sample was drawn from the 1972 UK General Household Survey and it contained 6,789 white male workers of all ages who were not in school or apprentices but were employees in their main occupation in 1972.

14. The independent variables included a series of dummy variables describing worker and industry characteristics.

15. For a more detailed discussion on the technique of principal factors see Harman (1967, Ch. 8).


17. A more detailed exposition of the ‘core’ and ‘periphery’ workforce dichotomy can be found in Atkinson (1985 & 1986).

18. Drawn from the 1983 US Current Population Survey consisting of all male heads-of-household between 20 and 65 years of age who were employed, reported that they normally worked more than twenty hours a week, earned more than the minimum wage and for whom data were available.


Appendix

The system is composed of two wage equations (1, 2) for each sector and an equation determining sector attachment (3):

\[
\ln W_i = X_i b_p + e_{pi} \quad (1)
\]

\[
\ln W_i = X_i b_s + e_{si} \quad (2)
\]

\[
y_i^* = Z_i b_a + e_{ai} \quad (3)
\]

where:

- $W_i$: is the individual’s wages
- $X_i$ and $Z_i$: are vectors of characteristics associated with the ith individual
- $b_p$, $b_s$, and $b_a$: are vectors of parameters
- $e_p$, $e_s$, and $e_a$: are normally distributed error terms
- $y_i^*$ is a latent variable measuring the tendency for the ith individual to be in the primary sector and the subscripts p and s indicated primary and secondary sectors.

Equation (1) is the wage equation if the individual is in the primary sector; equation (2) is the wage equation if the individual is in the secondary sector; and equation (3) is the switching equation.
We cannot observe $y_i^*$ but if $y_i^* > 0$ the individual is in the primary sector and her wage is determined by equation (1); otherwise if $y_i^* \leq 0$ the individual is in the secondary sector and her wage is determined by equation (2). In other words, the individual works in the primary sector if and only if:

$$e_a > -Z_b$$

(4)

Given a set of observations on $n$ individuals’ wages and characteristics, the likelihood function for the problem therefore is as follows:

$$\prod_{i=1}^n \left[ \Pr(e > Z_b | Z, X, e_p) f(e_p) + \Pr(e \leq -Z_b | Z, X, e_p) f(e_s) \right]$$

If we assume that $e_p$, $e_s$ and $e_a$ are normally distributed, then the log-likelihood function for the problem is given by:

$$\prod_{i=1}^n \left\{ (1 - F( -Z_b - (s_{pa}/s_{pp})e_p)/ (1 - s_{pa}^2/s_{pp})) f(e_p) + F(1 - Z_b - (s_{sa}/s_{ss})e_s)/ (1 - s_{sa}^2/s_{ss}) f(e_s) \right\}$$

where $f(.)$ and $F(.)$ are the normal density and cumulative distributions; $s_{pa}, s_{sa}$ are covariances between $e_p$ and $e_a$ and between $e_s$ and $e_a$ respectively; $s_{pp}$ and $s_{ss}$ are variances; and $s_{aa}$ is normalised to one.

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