Segmented Labour Markets: A Critical Survey of Econometric Studies

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Abstract

The analysis presented in this paper suggests that the econometric representation of Segmented Labour Market Theory has undermined the theory’s validity, particularly from an orthodox perspective. This is due to the exclusion of non-economic, non-quantifiable variables, which necessarily obfuscates the corroboration of an institutionalist theory emphasising the inclusion of factors not narrowly defined as ‘economic’ when explaining labour market asymmetries. This paradoxical situation prevails only within a positivist methodology and hence another, more appropriate paradigm for investigation must be sought. It is suggested that the adoption of a critical methodology could be an answer to the problem of ‘paradigm conflict’ in segmentationism and would consolidate a more cohesive institutional approach to labour markets.

Keywords

Segmented Labour Markets, Econometrics, Institutionalism
Introduction

Neoclassical labour market theory (Becker 1964) envisages a competitive market for labour characterised by individual mobility. Within this framework, earnings differentials should narrow. However, the degree and composition of earnings inequality has become increasingly difficult to reconcile with this mainstream model of a competitive market for labour. Furthermore, orthodox explanations of earnings inequity based on human capital endowments have been thought to overestimate the role of education as a determinant of earnings. This has been at the expense of other factors such as race/gender discrimination or the impact of social class affiliation that have been dismissed as being outside the boundaries of orthodox labour market analysis.

Other theories of the operational structure of the labour market have evolved with these criticisms at the forefront of their analyses. The critical position in labour economics has come under the broad heading of Segmented Labour Market (SLM) theories and has both recent and historically distant characteristics. The work of Cairnes (1874) and Mill (1909 [1848]), who criticised Smith’s (1993 [1776]) proposition that labour markets were competitive and wages were compensatory, offered the first approach to labour market analysis that included specific consideration of factors not strictly defined as ‘economic’. Mill examined the role of class affiliation in causing pre-market segmentation while Cairnes emphasised structural segmentation in terms of the ‘non-competing groups’ thesis. Subsequently, Pigou (1945) argued that ‘centres of production’ were in existence and highlighted the inability of workers to move between these centres due to their locality and the specialist nature of their skills. Wages were also described as being historically, as opposed to competitively, determined.

Via the critical work of the American Institutionalists such as Lester (1946), Kerr (1954) and Dunlop (1957), a cohesive SLM theory developed in response to burgeoning socio-economic problems in the United States in the late 1960s and early
1970s (see Doeringer and Piore 1971). According to Beck (1996), this analysis of urban labour markets represented an attempt to “describe labour market problems the way people in inner city and minority communities perceived them” (Beck 1996:99). Research based on this principle began to conceive the labour market as containing two distinct and separate groups of workers; one with privileged access to steady, skilled employment and the other confined to unskilled, insecure jobs in small firms (Ibid). These were described as the ‘primary’ and ‘secondary’ ‘segments’ or ‘sectors’. Furthermore, mobility barriers were in place that excluded the disadvantaged workers from competing with those in the primary sector. Radical Marxist interpretations of SLM analysis (see Edwards et al. 1975 and 1982) were apparent from its formation and were more methodologically than theoretically distinct from other segmentationalist typologies. All SLM perspectives however are united by the inclusion of institutional, social and psychological variables under their theoretical remit, a position consistently undermined by mainstream analysis.

There is now a substantial body of empirical literature investigating labour market segmentation, yet its theoretical validity has never been widely refuted or confirmed. The inconclusiveness of the evidence offered by supporters and opponents of the theory alike is due, in the main, to definitional problems relating to the construction of labour market segments or the inadequacy of the tests carried out (Sloane et al. 1993:569). A range of econometric methods has been applied in the investigation of a number of theoretically relevant issues. From the highly varied SLM literature, Ryan (1984) and Psacharopoulos (1978) outline three key propositions which form the basis of empirical tests of the segmentation hypothesis. These are,

(1) there are few, clearly identifiable segments in the labour market
(2) mobility barriers exist preventing movement between segments
(3) each segment has different employment and wage setting mechanisms.

Techniques used to test these proposals are mainly human capital regression (see Tables 1 and 2 below), cluster and factor analysis (see Table 3 below), switching
regressions with unknown regimes (see Table 4 below) or a combination of these (e.g. Anderson et al 1986 and Sloane et al. 1993). This paper goes on to review how researchers in the field of SLM theory have investigated labour market segmentation and the evidence offered by their work. It is ultimately concluded that econometric modelling within a positivistic methodological framework cannot adequately ‘capture’ segmentationism and hence, a more appropriate paradigm for investigation must be sought.

**Human Capital Models**

Human capital theory explains wage differentials in terms of worker heterogeneity rather than the differences between jobs. Low wage jobs are occupied by low productivity workers who are unable (or unwilling) to make the human capital investments that would enable them to secure better jobs. SLM theory maintains that, from analysis of the bi-modal dispersion of earnings suggested by labour market segmentation, it can be deduced that primary sector employment offers greater returns to any given stock of human capital (Elliott 1991:373). Primary sector incomes are, by definition, superior to those in the secondary sector and are no longer a consequence of the individual characteristics of workers (*Ibid*). They result instead from the characteristics of jobs in that inferior jobs make inferior workers rather than vice versa.

If, as the theory predicts, the secondary labour market has a relatively flat wage profile and the primary market has a profile similar to that suggested by human capital theory then the mechanisms controlling wages and employment must differ across the sectors. The perceived inadequacy of returns to human capital investment in the secondary sector is one proposition common to all versions of SLM theory and has been widely researched. Testing this hypothesis has involved predetermining the number of segments in the labour market either occupationally or by industry and thereafter testing for differences in each segment’s wage equation (Leontaridi 1996:22). The analytical tool has largely been an augmented classic human capital earnings function. 
Table 1 presents a taxonomy of those studies investigating occupational segmentation. As can be seen from this table, researchers employ different criteria for defining segments and, as a result, use different ‘variable bases’ (Ibid:19) in deciding to which segment an occupation is to be assigned. For the British labour market Psacharopoulos (1978) and McNabb and Psacharopoulos (1981) used the Goldthorpe and Hope (1974) occupational rating scale to assign individuals to two distinct labour market segments; the primary and the secondary (which was defined as those in an occupation with a rating of below 30). One advantage of the Goldthorpe-Hope scale is that the occupational variable measures the ‘goodness’ of the job held by the individual independently of income (which is only one element of the total attributes of any given job). Using exclusively white male samples, both of these studies cast doubt upon the relevance of the dual labour market approach for the UK, thus ignoring the possibility that race or gender characteristics may impact upon occupational segmentation aside from their heterogeneity effects.

Neuman and Ziderman (1986) later used data drawn from the 1974 Israel Labour Mobility Survey (also based on ‘prestige’ scores) to allocate male workers to the primary or secondary segments in the same way as McNabb and Psacharopoulos (1981) and Psacharopoulos (1978). Their justification for choosing a job-ranking scale was, similarly, due to its low correlation with earnings or earnings related variables and its perceived immunity from truncation bias (Neuman and Ziderman 1986:231). The results of this study were “very closely in line with the predictions of the dual labour market model” (Ibid:237) leading the authors to conclude that the theory was applicable to the Israeli labour market, if not more generally.

Other researchers have used job characteristics to define segments. In an early study for the US, Rosenberg (1980) used a classification schema that assumed that secondary jobs differ from primary sector jobs on a combination of characteristics rather than on one particular characteristic (Rosenberg 1980:35). He concluded that “relatively disadvantaged white males appear to have better occupational prospects than average blacks” (Ibid:48) thus supporting at least one of SLM theory’s sub-hypotheses and
acknowledging the effects of racial discrimination in determining labour market opportunity.

Table 1: Taxonomy of Sector Definition Based on Job Characteristics.

<table>
<thead>
<tr>
<th>Author/Date</th>
<th>Definition</th>
<th>No. of Sectors</th>
<th>Data Set</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psacharopoulos (1978)</td>
<td>Hope-Goldthorpe occupational rating scale</td>
<td>2</td>
<td>1972 General Household Survey</td>
<td>Negative</td>
</tr>
<tr>
<td>Neuman and Ziderman (1986)</td>
<td>Occupational rating scale for Israel</td>
<td>2</td>
<td>1974 Israel Labour Mobility Survey</td>
<td>Positive</td>
</tr>
<tr>
<td>Van Ophem (1987)</td>
<td>Job quality characteristics</td>
<td>3</td>
<td>1977 Quality of Labour Survey</td>
<td>Negative</td>
</tr>
</tbody>
</table>

In another, more inclusive, study for the US, Rumberger and Carnoy (1980) analysed the effects of segmentation on the mobility and earnings of male and female workers differentiated by race. Firstly, in a method similar to that of Rosenberg (1980), three
occupational segments were defined from information concerning the specific training requirements of jobs and the manner in which workers in each job relate to other workers (e.g. supervision); secondary, primary subordinate and primary independent. A second division of four industrial sectors was then applied to the three segments: private competitive, private non-competitive, public and self-employed. This categorisation of the labour market allowed Rumberger and Carnoy (1980) to compare the effects of the two divisions on mobility and earnings for four different race/gender groups; white women, white men, black women and black men (*Ibid*:119). They concluded that “blacks and women in the secondary market are in the ‘true’ secondary market” due to observed correlations in earnings in public and private sectors across races and genders (*Ibid*:30) suggesting a more complex configuration (with considerable immobility) than simple duality. A later American study by Boston (1990) only identified two labour market sectors (primary and secondary). His sector assignment was based on workers’ responses to the question of whether specific skills or prior training were conditions of their employment according to McConnell and Brue’s (1986) description of ‘raw labour’ii and its confinement to the secondary sector. This data was available via the 1983 Current Population Survey and the resulting sample contained both male and female and black and white workers. Like Rumberger and Carnoy (1980) the author was concerned with the extent to which earnings regressions, specified by race/gender groups, corresponded to SLM’s predictions, which they did for all groups with the exception of white men. He also found that in mobility terms, “being black has the largest negative effect” (Boston 1990:114) of all variables. Findings overall were said to support SLM’s theoretical postulates. Rumberger and Carnoy’s and Boston’s studies improve upon Rosenberg’s in that they include female workers in the sample and actively investigate their labour market status. However, the possible (perhaps non-economic) causes of immobility are not examined in any detail, with the exception of a cursory reference to the effects of social class in a concluding sentence (Rumberger and Carnoy 1980:119). Other studies of occupational segmentation for the UK demonstrate a similar weakness, although they have more specific theoretical foci.
Theodossiou (1995) analysed labour market segmentation in the UK on the basis of the career/non-career hypothesis developed by Okun (1981). Okun’s proposition was that the earnings of workers employed in the non-career sector will be less influenced by individual capabilities, experience or training than the earnings of an individual in the career sector (Theodossiou 1995:195). He found different wage setting mechanisms operating in a two-tiered labour market, as the model accorded lower significance to human capital variables in the secondary sector. Leontaridi (1998) also attempted to assemble theoretical concepts from the work of Okun (1981) as well as Fisher (1953), Kerr (1954) and Doeringer and Piore (1971) into a ‘structured’ and ‘structureless’ labour market model. The resulting sectoral split was made using four different criteria; promotional opportunities, salary advancement, training and employment stability providing an approximation of ‘structured’ and ‘structureless’ occupations. Subsequent regression analysis found that earnings of employees in the ‘structured’ labour market are determined differently from the earnings of those in the ‘structureless’ market (Leontaridi 1998: 28) providing evidence of segmentation. Although the samples used in the above investigations included male and female individuals, the possibility of gender-based differences in labour market behaviour or outcomes were neglected, as was the crucial issue of mobility.

In a test of dual labour market theory for the Netherlands, Van Ophem (1987) allocated jobs to three segments (a two-tiered primary sector and a secondary) taking account of Piore’s (1975) later portrayal of the segmented labour market. In Van Ophem’s study nine quality characteristics of jobs were considered in the course of segment creation. As with Rosenberg’s (1980) approach to sector determination, job attributes had to be *cumulative secondary or cumulative primary* e.g. a high wage alone is not enough to assign a job to the primary segment – there must be other advantages as well (Van Ophem 1987:1505). Van Ophem found that even though non-human capital variables were important, human capital variables were even more important (*Ibid*:1513) leading him to conclude that perhaps the ‘competing’ theories of the dualists and the neoclassical school were, in fact, complementary. He praises segmentationism’s emphasis upon the role of discrimination in the labour market but,
like the majority of its counterparts, this study does not investigate non-economic factors further.

Similar human capital studies have defined segments in terms of industrial structure in accordance with the versions of SLM theory postulated by Averitt (1968), Bluestone (1970), Edwards et al (1975) and Vietorisz and Harrison (1973) amongst others. Their conception of segmentation between jobs is associated with a duality in the industrial structure of the economy; a dichotomisation between what has been labelled the ‘core’ and the ‘periphery’. The concept of the ‘core’ sector functionally corresponds with the primary sector and the ‘periphery’ with the secondary sector. However, this specific distinction stems from such factors as technology, organisational structure, the nature of product demand (monopoly power) and unionisation opposed to factors such as wage rates, returns to education, mobility and working conditions. Thus an institution-level view is adopted in contrast to most of human capital’s necessarily individualistic approach. Beck et al (1978) describe the relationship between product market and industry structures in the dual economy approach as being,

linked to the emergence during the late nineteenth and early twentieth centuries of a core industrial sector dominated by large corporate enterprises which came to constitute an oligopolistic system of production. The core sector thus is differentiated from the periphery sector which is characterised by smaller firms, operating in a more or less open, competitive capitalistic environment (Beck et al. 1978:706).

This description further emphasises the similarities between the dual economy approach and the version of SLM theory offered by Berger (1982) who found that firms which cater to stable product markets create primary employment conditions (including notable job security) and firms facing unstable product demand operate in the secondary sector of the labour market. A taxonomy of sector definition based on industrial classifications is presented in Table 2 which indicates that studies based on industrial sector definition have generally found more evidence in support of SLM theory.
In one of the earliest of these studies, Osterman (1975) used a range of *subjective* criteria to define segments in a test of some of the proposals of Doeringer and Piore (1971) and Gordon (1972) for the US labour market. The three-tiered classification used (secondary, primary and primary elite) was based on factors such as wage rates, employment stability and worker autonomy. He selected an arbitrary means of segment creation by observing the parallels between segmentationism in the study of labour markets, the social status of occupations (see Blau and Duncan 1967) and sociological descriptions of class (see Piore 1975), ultimately using the concept of ‘job alienation’ to define segments, based on four criteria borrowed from Blauner (1967);

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

This study found strong support for dual labour market theory but acknowledged the arbitrariness of the classification schema as an empirical limitation. However, the degree to which workers feel ‘alienated’ or ‘autonomous’ as part of their jobs is an important component of at least one version of the SLM thesis and cannot be satisfactorily investigated without a degree of subjective reasoning. In attempting to negotiate this subjectivity, this study successfully handles the theoretical contention that social class affiliation is linked to workers’ position in the labour market.

Primarily concerned with establishment level characteristics, Osberg et al. (1986) used a stratified random sample of white male private sector employees to investigate job mobility and wage setting with respect to the industrial affiliation of the employing establishment and its size. This study found that “mobility patterns and wage determination do differ by labour market segment” *(Ibid:340)* and the authors also observed “a large number of people who, for one reason or another, do not move between segments” *(Ibid)*. As with the clear majority of econometric studies investigating segmentation, there was no speculation as to what the reasons for
immobility could be and, since the sample was white and male, the gender/race characteristics of this immobility were masked.

Later, a male and female sample from the same data source was split \textit{a priori} into a high-wage primary segment (consisting of the ‘core’ industries such as resource extraction and construction, the knowledge services and the craft sector) and a low-wage secondary sector (represented by the sum of all other classifications) by Baffoe-Bonnie (1989). This study found significant differences between male and female labour supply in both segments but also concluded that “in both cases the wage elasticity of labour supply was positive in the secondary sector and negative in the

<table>
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<th>Author/Date</th>
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<th>No. of Sectors</th>
<th>Data Set</th>
<th>Evidence</th>
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<tbody>
<tr>
<td>Alexander (1974)</td>
<td>SIC four-digit industrial classifications</td>
<td>3</td>
<td>1965 Social Security 1 percent work history file</td>
<td>Weakly positive</td>
</tr>
</tbody>
</table>
primary segment” (*Ibid:*77). Furthermore, Baffoe-Bonnie investigated the effects of children on female labour supply and, not surprisingly, found that their hours of work decreased as the number of children increased. In policy terms, this led the author to suggest an increase in government subsidised (“less-expensive”) day-care in order to enhance female labour market participation (*Ibid*). It is assumed that this would be intended to redress the gender balance in the primary sector as children are a barrier to segment mobility. This study is refreshing in that it actively examines female labour supply in a SLM context but, again, the fact that the ‘mobility impact’ of children is more severe for women than for men is not questioned. Indeed, the policy recommendation, that the public sector should ‘support’ women in their role as primary carers, exposes traditional ideological assumptions regarding gender expectations.

The concept of the dual economy has also been used to investigate the effects of a ‘core’/‘periphery’ dichotomy on male labour market mobility and employment stability (Alexander 1974, Buchele 1983). Alexander’s (1974) study classifies industries into three types of structure according to the degree of firm and industry mobility; a relatively low probability of an employee leaving a firm characterises *manorial* structure; a relatively high probability of leaving the firm and industry is an indication of *unstructured* markets; and a large positive difference between the possibility of leaving the firm and the probability of leaving the industry is associated with *guild* structures. This three-way classification is in accordance with Kerr’s (1954) theoretical perspective. Alexander’s analysis is also concerned with the concept of internal labour markets and industry structure and uses the above taxonomy to examine the relationship between income and experience across the structures. He concluded that variations in mobility patterns are linked to different internal labour market structures but “the complexity and interrelatedness of the forces and effects examined in this study preclude one from drawing a set of simple conclusions” (*Ibid:*83) and that “it is doubtful that a single theory can successfully encompass these findings” (*Ibid*). Buchele (1983) examines the effect of being in the ‘core’ versus the ‘peripheral’ industries on various measures of employment stability. His ‘dual
economy’ hypothesis was that core firms establish circumstances of employment that tend to foster stability while peripheral firms fail to promote employment stability and/or actually foster instability; a hypothesis that was upheld.

Although the ‘dual economy factor’ has been overwhelmingly associated with the American industrial structure, some, more recent, research has investigated labour market segmentation and industrial dualism with reference to other economies with different regulatory policies. In their analysis of the highly regulated manufacturing sector in the developing Cameroonian economy Thomas and Vallee’s (1996) industrial structure is conceptualised as ‘formal’ and ‘informal’ as the cost of setting up formal, legal businesses is so prohibitive that a sizeable informal, illegal sector may emerge. In a development context, the coexistence of the ‘formal’ and ‘informal’ sectors corresponds to the segmented labour market landscape of the ‘core’/‘periphery’ or the ‘primary’/‘secondary’ sectors. Thomas and Vallee (1996), in investigating the Cameroonian labour market, found evidence of segmentation primarily between regulated and unregulated industries but, despite using a male and female sample, offer no information concerning the gender composition of such a dichotomy.

Common to all human capital studies that have investigated one, some or all of the three SLM sub-hypotheses is the issue of a priori segment definition. It would appear from the preceding analysis that segment demarcation by industrial sector has resulted in more conclusive support for SLM theory. This, it could be argued, is due at least in part to the institutional approach to segmentation that ‘industrialism’ necessarily engenders. Segmentationism is a philosophically institutional concept and, as such, is somewhat hampered by considering individual characteristics ahead of structural variables, particularly when the theory reflexively acknowledges that agency and structure are inextricably inter-reliant. However, as part of its econometric ‘cross-examination’ the dualist approach has faltered at more practical hurdles, specifically, the process of segment delineation.
It has been shown that most studies have used *a priori* classification schemes, however, these studies do not account for the endogeneity of an individual’s labour market segment (Leontaridi 1996:26). The common practice therefore of dividing the labour market into primary and secondary segments based on occupation, job or industrial characteristics has been criticised as being too arbitrary (Cain 1976). As SLM theory predicts a lack of human capital returns for workers in the secondary sector, many studies divide the labour market into high and low wage segments and then regress earnings on education and other variables, thus creating a ‘truncation bias’. In the *a priori* determination of industrial sectors or the arbitrary classifications made between good and bad jobs, returns to human capital will be biased. As Cain (1976), Taubman and Wachter (1986) and Boston (1990) have all pointed out, the effect of education on earnings in the low-wage sector is bound to appear inferior to those of the high-wage sector as the high values of the dependent variable are ‘cut off’ from the sample. This “truncating or censoring of segments” occurs when “definitions are used which fail to include observations above a floor or below a ceiling” (Boston 1990:101). The mechanics of the truncation problem are explained by Orr (1997),

Regardless of the criteria used to define labour market segments, the secondary labour market will contain primarily low-income workers. By focussing on the secondary sector, the sample potentially will be truncated at some arbitrary level or band of income. If the sample population is not segmented, this truncation of the dependent variable will introduce a downward bias to the regression co-efficients of any equation predicting income. If, however, the population is in fact segmented and workers are correctly identified by segment, there is no truncation bias, and the reduced regression coefficients of an earnings function correctly reflect the lack of return to human capital in that sector. Thus, truncation bias is only a problem if segmentation does not exist (Orr 1997:232).

The challenge to segmentationist researchers therefore lies in the assumption that segmentation exists *a priori*; if this assertion is made then the test loses much of its explanatory legitimacy and can, of course, be criticised for demonstrating truncation bias.

Similarly, the *a priori* classification approach has been criticised by Psacharopoulos (1978) on the grounds that it displays circular reasoning; that if a segment is defined in
terms of pay levels, it is a circular argument to claim that the secondary sector has low pay. He argued that, conceptually, splitting the sample into two segments amounts to,

...standardising for occupations as whatever split criterion one adopts (males versus females, whites versus blacks etc.) the upper segment is bound to contain the highly paid occupations and the lower segment the low pay occupations. As earnings and the type of segment to which an individual belongs are highly correlated, it is very likely that the regressions slope will be higher in the primary segment (Psacharopoulos 1978:426).

Earnings functions will therefore underestimate returns to schooling as the effects of education on earnings brought about by changes in occupation are denied. Pre-empting Orr’s (1997) observations, Psacharopoulos (1978) concluded that “…the cards are stacked before the exercise begins to show that segmentation exists, simply because it is supposed a priori to exist” (Ibid:427).

Researchers have tried to address these criticisms by offering different solutions to the truncation problem. For example, McNabb and Psacharopoulos (1981) and Neuman and Ziderman (1986) used occupational ratings scales as their ‘cut-off’ criterion in defining segments. These scales were constructed by direct reference to income and education, largely avoiding truncation bias. However, other commentators have claimed that the choosing of the cut-off point on the occupational scale can be arbitrary (or even erroneous) and therefore still demonstrates truncation bias (Mayhew and Rosewell 1979). As has been shown, other criteria thought to be distinct from pay rates have also been used to define segments. These include, for example, the employing firm’s product market characteristics (Osberg 1987), training requirements (Rumberger and Carnoy 1980, Boston 1990) and the extent to which workers experience ‘job alienation’ (Osterman 1975). In this way, sectors included workers irrespective of their earnings, managing to elude the specific problem of truncation bias. However, these methods of sector assignment are far from being entirely objective. In testing for evidence of segmentation, researchers have used cluster analysis, factor analysis and switching regressions with unknown regimes in an attempt to overcome the problem of a priori sector determination.
Cluster Analysis and Factor Analysis

In the context of labour market segmentation, cluster analysis is used to assign occupations or employees into relatively uniform groups with respect to a given set of theoretically relevant variables. The entire range of indicative job characteristics suggested by SLM theory can therefore be gathered together to reveal segment boundaries if segments are indeed present. Furthermore, observations are allowed to fall naturally into an unspecified number of clusters “without forcing the data into a predetermined number of segments” (Leontaridi 1996:32). Another inherent advantage is that earnings dispersion can be analysed heuristically rather than forcing the results into a strict duality structure (Ibid). Table 3 presents the major studies using cluster or factor analytic tests of segmentation, often in conjunction with regression techniques.

For the US, Anderson et al (1986) used linear indices of job traits to classify jobs as ‘good’ or ‘bad’ before using these indices to analyse how jobs clustered in the market. They wished their study to be devoid of any prior deference to SLM theory’s presuppositions in the classification process in order to arrive at clusters that were ‘free’ and spontaneously composed. General categories of job traits included wage levels and profiles, training requirements, turnover and job satisfaction.

They used data from the 1974-1980 waves of the Panel Study of Income Dynamics, taking the household heads that were in the labour force in 1974 and were not self-employed (this included men and women) as their unit of analysis. In assessing SLM’s predictions, all two-digit occupations were tested for the presence of these aforementioned job traits (Ibid). Anderson et al used cluster analysis to indicate if jobs, classified by industry and occupation, can be grouped together based on shared job traits and, if they can be so assembled, do these classifications conform to those of the dual labour market theory? Their study found that, in so far as two distinct clusters did exist, they were based on a blue collar/white collar division and not a segmented labour market dichotomy (Ibid:588). Contrastingly, Boston (1990) was deliberately mindful of SLM theory when selecting variables and used cluster analysis to separate
markets according to a strict dualist structure. He derived the dual labour market partition from responses to questions in the January 1983 Current Population Survey concerning training requirements of present or last employment; this procedure provided an approximation of primary and secondary occupations (Boston 1990:99).

Table 3: Studies Using Cluster or Factor Analysis

<table>
<thead>
<tr>
<th>Author/Date</th>
<th>No. of Sectors</th>
<th>Data</th>
<th>Method</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oster (1979)</td>
<td>2</td>
<td>Three-Digit 1960 Census Code industries</td>
<td>Factor</td>
<td>Positive</td>
</tr>
<tr>
<td>Tolbert et al (1980)</td>
<td>2</td>
<td>1971 Bureau of Census industries</td>
<td>Factor</td>
<td>Positive</td>
</tr>
<tr>
<td>Sloane et al (1993)</td>
<td>2</td>
<td>1986/87 SCELI</td>
<td>Cluster/Factor</td>
<td>Negative</td>
</tr>
<tr>
<td>McNabb and Whitfield (1998)</td>
<td>5</td>
<td>Workplace Industrial Relations Survey (WIRS) 1990</td>
<td>Factor</td>
<td>Weakly Positive</td>
</tr>
</tbody>
</table>
Following Ward’s (1963) clustering method the data was then used to examine earnings differentials and occupational mobility across market segments within groups that were disaggregated by race and gender. This disaggregation within groups rather than between segments allows differences to be examined and findings are therefore not able to be explained by variations in the way in which groups optimise their human capital investments (Ibid:100).

Likewise, a key feature of Flatau and Lewis’ (1993) study was their method of segment delineation using information on a broad range of theoretically relevant job characteristics. They proceeded to use a comprehensive classification to examine the distribution of Australian workers according to gender, migrant status and trade union membership. Their classification schema involved a virtually exhaustive catalogue of job characteristics intended to assign jobs to one of two labour market segments (again, the primary and secondary markets). These included wages, employment benefits, general and specific training opportunities and requirements and job security (Ibid:285). This study identified 3 segments in the Australian labour market and directly, although briefly, commented upon their gender and ethnic composition. It was shown that women were over-represented in the “most significant element within the identifiable secondary sector” (Ibid:292) and that the evidence was “somewhat patchy” with relation to immigrants (Ibid). There was no analysis concerning the possible reasons (economic or otherwise) for these phenomena nor was there any consideration of inter-sectoral mobility.

Using cluster analysis as part of a multi-method approach, Sloane et al. (1993) also selected variables in accordance with theoretical specifications such as training requirements and promotional opportunities; altogether, these were thought to provide “a reasonable representation of the various dimensions of labour market segmentation” (Sloane et al. 1993:574). Their data was for 6 local labour markets drawn from the Social Change and Economic Life Initiative (SCELI) in 1986 and 1987. From these 6, half were prosperous economies with low unemployment and half were in recession with high unemployment to allow for testing of the specific hypothesis that the degree
of labour market segmentation will be influenced by labour market ‘tightness’ (*Ibid*:569). The algorithm revealed two sectors of roughly equal size,

Cluster 1 consisted of establishments which were, on average, less than half the size of those in cluster 2, were more likely to have internal promotions, but to be more reliant on the use of casual labour and more likely to require certain qualifications (*Ibid*:574).

The divisions between clusters therefore were not entirely concurrent with that of the SLM hypothesis. Furthermore, *factor analysis* was used to determine whether a smaller number of components existed that could clarify the information available. It was found however, that such analysis only served to reinforce the perceived homogeneity of the labour market.

Other researchers have used factor analysis as a test for segmentation, either by itself (Oster 1979, McNabb and Whitfield 1998) or in conjunction with other statistical techniques (Tolbert et al. 1980, Buchele 1983, McNabb 1986). The aim of a factor analytic test of segmentation would be to uncover a relatively small number of factors that could be used to represent the complex relationships between variables identified as pertinent by the theory. This technique has been used most widely to test a ‘strict’ industrial dualism model. Subsequently, a common factor should be identified that separates individuals into either core or peripheral sectors. This factor would be expected to load positively or negatively on the characteristics of industrial structure identified in the ‘dual economy’ literature such as variations in size and market power. Oster (1979) found support for the theory of the dual economy for the US in his analysis of 83 3–digit 1960 Census Code industries. The data generated a factor that reflected a core/periphery division as hypothesised; its associated variables and the signs of the loadings were, in most respects, consistent with a dual economy interpretation (Oster 1979:38). Tolbert et al. (1980) also found a common factor for American industrial structure that they interpreted as “confirming the utility of a dichotomous sectoral measure for analysis of the effects of economic segmentation on socio-economic processes” (Tolbert et al. 1980:1114). Buchele (1983) however, has
criticised these particular studies for *presupposing* a causal relationship between industrial structure and labour market outcomes,

The problem with this approach is that, while it establishes an association between a certain set of industry characteristics and certain labour market outcomes, it fails to distinguish clearly between the hypothesis of structural differentiation, on one hand, and the hypothesis that structural differences cause differences in labour market outcomes (e.g. earnings and unemployment stability), on the other hand (Buchele 1983:410).

In his test, he proposed to instead “estimate directly the effect of being in a core versus peripheral industry on various measures of employment stability and test the statistical significance of the effect” (*Ibid*:411). Factor analysis of the three-digit census industry characteristics data from mining, constructing, manufacturing communication, transportation and public utilities revealed a core/periphery dichotomy in industrial structure (*Ibid*:417). Subsequent regression analysis of different measures of employment stability over different time periods supports the idea that ‘core’ employment circumstances foster employment stability; these results held for various measures of stability and phases of the business cycle (*Ibid*). McNabb (1986) was also interested in the economic cycle with relation to dualism. His factor analytic approach was designed to investigate firstly, the association between pay and a number of indicators of segmentation (industrial, occupational, racial and marital) and secondly, evidence of changes in the structure of earnings in the period 1978-1983 with a view to exploring the combined effects of the 1980/81 slump and deregulation policy. In a method similar to that of Buchele’s (1983) study, factor analysis of product markets and employer attributes revealed three independent factors each representing distinct industrial sectors (allocated according to factor scores) in the UK. Different earnings determination mechanisms were said to be in operation in the sectors with superior rewards to schooling in the core industries in the period 1978-1983 (with the exception of 1981). This study found that market power, capital intensity and employee organisation were instructive factors. However, results gleaned from these studies of male labour market participation convey nothing about female labour supply and how it relates to segmentation in terms of discrimination.
Switching Regressions with Unknown Regimes

One important step forward for the economics of segmented labour markets came in the form of the ‘switching equations’ model first employed by Dickens and Lang in 1985. The model overcame the truncation problem of sector assignment by simultaneously estimating three separate wage equations (one for the primary sector, one for the secondary sector and a third for the prediction of sector attachment). Their approach represents advancement over previous research in the area by allowing the distribution of wages and worker attributes to determine assignment of workers to sectors, avoiding problems of abitrariness and truncation that had complicated the interpretation of earlier work. Their criticisms of earlier work are described thus,

...empirical work contrasting dual market and human capital theory has suffered from two major drawbacks. The taxonomies that have been developed simultaneously bias the results in favour of the dual market hypothesis by virtue of the selection criteria and are too gross to allow accurate testing of the hypothesis (Dickens and Lang 1985:794).

Table 4 presents the studies that will now be discussed that employ a switching regression with unknown regimes approach in testing for labour market segmentation. This table shows that all studies considered have provided positive evidence of a strict dualist structure suggesting that ‘endogenising’ segment attachment leads to more categorical findings, albeit within a small number of studies compared with those in the human capital mode (Tables 1 and 2) or the cluster or factor analytic tests (Table 3). However, the process of sector demarcation, and the variability of the results gleaned from these studies is largely irrelevant. It is the nature of econometric treatment of segmentationism itself that complicates its validation and not the minutiae of procedure. This argument will be further developed below.

Dickens and Lang (1985) wished to test the hypothesis that two wage equations fit significantly better than one and that the best-fitting equations fit the predictions of the dual labour market hypothesis. In order to correspond with the predictions of dual labour market theory, primary sector earnings profiles would have to be sloping upward in schooling and experience, while the others would be flat with respect to
human capital variables and generally below the other line. Furthermore, since the data used was limited to a sample of adult male heads of households (drawn from the thirteenth wave of the Panel Study of Income Dynamics) it would be expected that the low wage line would represent fewer observations. This study found convincing evidence that the two sectors of the dual labour market had different wage setting mechanisms and that primary sector jobs are ‘rationed’; effectively upholding two important principles of labour market dualism. This study, of course, was limited to an all-male sample, as were the samples used by Rebitzer and Robinson (1991) and Sakamoto and Chen (1991) in their investigations of American labour market segmentation.

**Table 4:** Studies Using a ‘Switching Regressions’ method.

<table>
<thead>
<tr>
<th>Author/Date</th>
<th>Data</th>
<th>No. of Sectors</th>
<th>Evidence</th>
</tr>
</thead>
</table>

Rebitzer and Robinson (1991) investigate the ‘effort regulation’ model as proposed by Bulow and Summers (1986). This model argues that labour markets are segmented due to differences in the technology of supervision across firms (Rebitzer and Robinson 1991:710). Primary sector firms are argued to pay a ‘supervision premium’ because such jobs are difficult to monitor in contrast to secondary sector jobs that would hence
pay the market-clearing wage. Following the ‘switching regressions’ model, equations were estimated (the third, as ever, representing an allocative ‘switch’ equation). Rebitzer and Robinson (1991) found that increases in plant size have a positive, statistically significant, effect on wages in the primary labour market. Focussing on the equilibrium versus queuing debate (see Thurow 1975). Sakamoto and Chen (1991) found that increases in plant size have a positive, statistically significant, effect on wages in the primary labour market. Sakamoto and Chen (1991) found that wages were unlikely to be compensating and that “supply and demand factors may interact with institutional variables to influence wages” (Ibid:306) thus supporting the SLM hypothesis relating to wage determination. Again, no analysis of the effects of race or gender in determining labour market outcomes is offered. Similarly, Roig (1999) uses an unknown regimes approach in testing labour market segmentation in the Spanish labour market. Roig’s analysis showed significantly different wage setting mechanisms were operating in two distinct segments. This study uses a mixed sample and offers quantitative description of the over-concentration of women in the secondary sector but the mobility of workers from one segment to the other was not explicitly considered.

Dickens and Lang (1987) took a different approach from the previous wage-setting focus and used the same ‘switching regressions’ technique to determine how the relative sizes of the primary and secondary sectors changed over the 1973-83 period. Their analytical framework in this instance was the ‘de-industrialisation’ hypothesis. The de-industrialisation debate centres on the twin concerns of a decrease in the size of the primary labour market relative to the secondary sector (or ‘polarisation’ of the labour force) and associated adjustment costs. Dickens and Lang’s approach to the estimation of sectoral size is summarised as being largely congruent with their earlier paper (1985). With respect to the size of sectors, Dickens and Lang (1987) found a ‘substantial’ decrease in the numbers of workers associated with the secondary sector and an increase in the numbers associated with the primary sector contradicting the prediction of the de-industrialisation hypothesis. They acknowledged the over-representation of women in secondary sector employment and concluded that a portion of the male-female wage differential is attributable to this situation (Ibid:101). At the
same time as pointing out their ‘innovation’ in including women in the sample, they offered no further explanation.

‘Paradigm Conflict’

This preceding survey of statistical research has considered the *econometric* assessment of SLM theory showing that method is often problematic and results are often inconclusive. It could be argued that the pursuit of statistical validation by SLM theorists has been complicated not only by the plurality of the segmentationist perspective but also by the shortcomings of statistical analysis. As the SLM hypothesis embodies such a wide range of non-economic, social and psychological factors in explanation of labour market phenomenon it remains difficult, if not impossible, to prove or refute the theory statistically. Indeed, when Dickens and Lang (1985) first adopted the advanced econometric switching regressions approach, they concluded that their results “point to the value of non-econometric techniques for uncovering and understanding labour market institutions” (Dickens and Lang 1985:802). It could be contended then that the breadth of explanation offered by segmentationism represents a major advantage over mainstream theories and, as such, the theory should not be devalued on the basis of methodological inelegance alone. If the theory (or theories) cannot find the legitimacy it requires in order to offer a cogent alternative to orthodoxy on a positivistic epistemological platform then other means of expression must be sought. Economic discourse needs a cohesive institutional approach to labour markets (see Gimble 1991). But the question, to what paradigm does segmentation belong? (Piore 1983), has not been satisfactorily resolved, not least methodologically. Segmentationist theory draws attention to a range of institutional barriers to labour market participation and has therefore been linked to the institutionalist school of economic thought. Ramstad (1993) however has recognised that the dualist orthodoxy has not explicitly aligned itself with the philosophical presuppositions of institutionalism, nor has it presented itself as a theory of the labour market intended to rival neoclassical explanations from a position of philosophical opposition. He concluded that,
Recent major works by mainstream institutional writers fail to evince a distinctive institutional approach to the conceptualisation of labour markets. In short, the dual labour market theory - a theory developed by individuals who reveal almost no familiarity with mainstream institutionalism and who accordingly have made no effort to root that theory in the broader institutional literature - is apparently the single contender for the allegiance of present-day institutionalists interested in the microeconomics of labour utilisation and pricing (Ramstad 1993:178).

The grounds for associating the segmentationist perspective with the institutionalist school of economic thought are that their underlying conceptions of human action and organisation are corresponding, as are the phenomena they seek to understand (i.e. social rather than individual). As Piore (1983), a leading proponent of segmented labour market theory, has identified,

At the core of labour market segmentation are social groups and institutions. The processes governing allocation and pricing within internal labour markets are social, opposed either to competitive processes or to instrumental calculations. The marginal labour force commitment of the groups which creates the potential for a viable secondary sector of a dual labour market is social. The structures which distinguish professional and managerial workers from other members of the labour force and provide their distinctive education and training are also social. To understand these phenomena, one therefore needs a paradigm which recognizes and encompasses social, as opposed to individual, phenomena (Piore 1983:252).

Piore (1983) goes on to offer two alternative paradigms which he believes fulfil this role; one being Marxism and the other ‘structuralism’ as proposed by Kuhn (1962). Marxism is proposed for its understanding of the world as evolutionary and its focus upon the social, although criticised for narrowly considering only one form of social group; ‘class’, and one sociological foundation; the production process. Structuralism, on the other hand, provides a bridge between the social and the individual in attempting to “understand society in terms of the nature of cognitive processes” (Piore 1983:253). From this angle, society does consist of discrete individual elements but rather than being aggregated to form institutions they are processed as part of an existing framework or ‘structure’ which these institutions help to reproduce.

Methodologically, Kuhn’s ‘structuralism’ (1962) emphasised positive descriptive methods over the normative prescriptive (Blaug 1980) and held that ‘normal science’ had always dominated ‘revolutionary science’ historically. Piore has stated that the
labour market segmentation hypothesis does not fit the ‘normal science’ paradigm nor does he describe himself as a revolutionary (Piore 1983:249). The association he made between the dualist thesis and what Kuhn describes as the abnormal and aparadigmatic (in any ‘scientific’ discipline) lies in the ‘sentiments’ and ‘reactions’ (Ibid) that the idea has invoked from those practicing ‘normal science’. These are described as being fury, disdain, resentment, sarcasm and condescension (Ibid).

This may offer some explanation as to why the investigation of the dual labour market hypothesis, as has been shown, has largely adhered to the positivist research paradigm in spite of its ‘radical’/‘institutional’ characteristics. Indeed, as Piore (1983) has further pointed out, the notion of stratification in labour markets was derived from ‘participant observation’ carried out by those involved in civil rights and the anti–poverty movement of the late 1960s. As Piore, one of those observers, describes,

The ideas were an attempt to make sense out of the labour market problems as the people in these communities experienced them (or at least how they described their experiences) and to describe the labour market as these people saw it. To the extent that self-conscious, structured research was involved in the initial formulation of these ideas, the research was based upon relatively open-ended, unstructured interviews with the economic actors themselves (Ibid:250).

The development of the SLM hypothesis then was based around radically qualitative research reflecting its heterodox nature and its methodological roots in critical theory. Furthermore, the researchers involved were making overtly normative statements concerning racial inequalities in the American labour market; fact and value were not disengaged from one another and research was mindful of socio-political context and consciousness, thus being inconsistent with orthodox research.

It would seem that the institutionalist school of thought combines the most useful elements of both of the doctrines offered by Piore (1983) firstly in its evolutionary world-view and secondly, in its depiction of human behavioural motivations. Hamilton (1991) proffers this world view as being concerned with the whole pattern of human activity; “attempting to place the economic aspects of that behaviour in relation to the larger whole of which economics is only a part” (Hamilton 1991:8). From this holistic
approach then comes an emphasis upon the study of institutions and their effect on human behaviour. Implicit within this form of analysis is the idea that human behaviour is moulded by institutions or displays, at least, the ability to be moulded. Gruchy (1947) has argued that the distinguishing feature of institutionalist thought in economics is this acknowledgement of the *interrelatedness* of economic activity and activity in other spheres of human existence. From this perspective, the SLM approach can be described as overtly institutionalist; it emphasises the significance of societal institutions and their subsequent effects on individual worker psychology (the ‘negative feedback’ sub-hypothesis for example) as well as conceiving labour market institutions as the progeny of human psychology (e.g. the ILM). This *interconnection* (of the individual and the institutional) is instrumental in forming the hypothetical SLM structure. It is this aspect of the theory that differentiates it most succinctly from the orthodoxy and hence characterises it as philosophically institutionalist. However, the *methodological* nature of segmentationism is ostensibly inconsistent with an institutionalist approach.

As has been shown in this paper, studies investigating segmentation have adhered to a consistently positivistic research framework and methods have been largely, if not exclusively, quantitative. This has led to a subsequent devaluation of the non-economic aspects of the theory that are not easily quantifiable. Tests for segmentation have generally centred round the search for quantifiable (‘scientific’) evidence when, in actual fact, the most authoritative strands of the theory emphasise non-quantifiable and non-calculable labour market variables. The institutionalist nature of SLM explanations becomes obscured when researchers adopt mainstream econometric methodology, weakening its allegiance to institutionalist thought and entrenching its paradigmatic dispossession. Methodologically, institutionalist thought mirrors the inclusiveness of its approach to theory by embracing a *critical* methodology that promotes the contextualisation of economic research as well as a plurality of methods. A critical approach to the analysis of labour market inequalities would stress the link between societal institutions, the psycho-cultural make-up of the individual and the social processes that influence their interaction. Crucial to the institutionalist school,
an analysis of historical and ideological context is also an integral part of critical research. Harvey explains that from a critical methodological perspective,

Historically specific phenomena cannot be regarded as independent; on the contrary they are related to other social phenomena within a prevailing social structure. Critical social research analyses this structure. Social structures are maintained through the exercise of political and economic power. Such power (grounded in repressive mechanisms) is legitimated through ideology. Critical social research thus addresses and analyses both the ostensive social structure and its ideological manifestations and processes (Harvey 1990:19).

This stands in direct contrast to the positive (‘scientific’) tradition in economics whose express aim is to describe surface appearances by using the stylised axioms of econometric models. Furthermore, critical empiricism states that economic research cannot, and indeed, should not try to achieve value-neutrality; that it must, by its very subject matter, be saturated with normative interests. Within this, critical investigation inevitably calls dominant ideology into question, as Crotty (1998) explains,

In the type of inquiry spawned by the critical spirit, researchers find themselves interrogating commonly held values and assumptions, challenging conventional social structures and engaging in social action (Crotty 1998:157).

Contextual values and interests underpinned the development of the SLM perspective as it gained momentum as an attempt to improve the lives of marginalised workers in the American labour market of the 1960s and 1970s. This highlights the compatibility of SLM theory and critical research methodology, despite the dominance of positivism and econometrics in modern economics. In asking substantive questions about existing social processes and institutions, therefore, critical analyses has tended towards ‘theoretical treatises’ and, hence, the critical research tradition lends itself more readily to methods broadly defined as ‘qualitative’ as opposed to the fervently ‘quantitative’. However, methods of data collection are not as important as ensuring that data is not taken at face value (Harvey 1990:8). Critical research integrated into the segmented labour market tradition would therefore embrace a plurality of empirical methods under one methodological aegis; socio-political and historical context and an analysis of existing power structures. Injustice and oppression are central aspects of the social relationships that are said to generate and perpetuate a segmented labour market.
structure, as described by the theory. The econometric search for segmentation, however, is ideologically blind to these forces and hence cannot adequately address segmentation itself, its sources, or its consequences.

Conclusion

This paper has argued that the research program of segmentationism represents an attempt to ‘fit’ the theory around methods associated with a positivistic epistemology. Econometric studies have concentrated on the individual, economic contentions of the theory by way of human capital models, cluster and factor analysis and ‘switching regressions with unknown regimes’. These studies have also pertained largely to the labour market position of white males which undermine the extent to which race and gender variables could impact upon labour market functioning. Results based on these statistical techniques have been uneven leading to a loss of legitimacy for the theory. Methodological discussion has also largely centred on the merits of competing approaches to the economics of segmented labour markets; which econometric technique yields the most categorical results? However, in econometrically testing its suppositions in a hypothetico-deductive manner, many of the original non-economic variables that SLM theory so rightly draws attention to are undermined. Since the evidence for segmentation pertains to the economic, the crux of the segmentationist argument begins to appear as if it too centres round factors that are strictly economic. However, SLM theories are unambiguously associated with an institutional analysis of labour markets and, particularly those manifestations in the radical Marxist tradition, have analysed the ideological context of capitalism. Social relations have also been consistently regarded as significant in generating segmentation; the relationships between labour and capital, workers and supervisors, within communities and between whites and blacks have all been pivotal to some extent in the SLM literature. The potential influence of social interaction has not been as visible as those pertaining to the individual such as earnings regressions and inter-sectoral mobility variables. This can only be due to the fact that such complex and culturally embedded relationships
are non-quantifiable and their impact cannot be easily distinguished from other ‘institutional’ forces.

Furthermore, in attempting to ‘compete’ with neoclassical explanations of the labour market in a positivistic methodological arena, segmentationism is devaluing its own philosophical standpoint. Segmentationist theory, as an institutional theory (although perhaps not consciously so), emphasises structure over agency and contextual over ahistorical and a-temporal analysis as well as containing normative elements. Segmentationism’s development therefore could be characterised in terms of ‘paradigm conflict’ between the theory’s philosophical underpinnings and the nature of associated methodology. Under these contradictory circumstances the theory will not find mainstream validation but will rather continue to encounter the disdain and condescension of the orthodoxy. It is argued therefore, that segmentationist researchers should align themselves more consciously with the institutionalist philosophical position and adopt more critical research methods which would enable their theories to find validation on their own terms. If the pre-eminence of positivism in SLM theory were challenged, and a more critical methodology were applied, an analysis of social structure, relations and institutions could return to the ‘front line’ of segmentationist research. This position would not only be consistent with the philosophical character of SLM theory, hence moving towards the resolution of ‘paradigm conflict’, but would also, and perhaps more importantly, be a move towards forming a conscious and cohesive institutionalist approach to labour markets.

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¹ For further explanation see Mincer (1974).
² This term is used to describe the secondary sector as it requires work that is simple, menial, repetitive and interchangeable (McConnell and Brue 1989:454).
³ The ‘promotion’ variable is used in the same way as the ‘career’ variable in Theodossiou’s (1995) study and, similarly, represents the career prospects available to certain employees in Okun’s (1981) model.
⁴ The notion of ‘strict duality’ implies a bi-modal dispersion of earnings for any given labour category. A more heuristic interpretation allows for a unimodal distribution; as long as the normal earnings dispersion remains large, in-market segmentation may still be in evidence (Ryan 1981:7).
⁵ Other methods were a simple career/non-career model, factor analysis and switching regressions.
⁶ Problem solving activity in the context of an orthodox theoretical framework (Blaug 1980:27).
⁷ The overthrow of one framework by another in consequence of repeated refutations and mounting anomalies (Ibid).