# SEGMENTED LABOUR MARKETS AND EARNINGS IN IRELAND

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## 1. Introduction

Human capital theory emphasizes differences among individuals as the determinants of the distribution of earnings: workers in low-wage jobs are those who have low productivity, because they have been unable or unwilling to obtain the skills necessary to improve their productivity and earnings. Dual labour market theory, on the other hand, sees the labour market as divided into distinct primary and secondary sectors, of "good" and "bad" jobs respectively, with different wage determination systems and with good jobs being rationed. More broadly, labour market segmentation theory sees the labour market as divided into distinct sectors systematically differentiating the job rewards achieved by comparable individuals. The ideas behind these segmentation theories have a long history, and inspired a substantial body of research in the 1970s, particularly in the USA (following Doeringer and Piore (1971).[1] After a brief eclipse following Cain's (1976) critique there has been a resurgence of interest in segmentation in the USA in the last decade, with the work of Dickens and Lang being particularly influential (Dickens and Lang 1985, 1993). Indeed some see dual labour market theory as having recently been integrated into the mainstream of labour market theory (Blackaby, Clark and Leslie 1995), though in our view this assessment is premature.

Up to this point there has been little attempt to test or apply segmented labour market ideas in empirical work on the Irish labour market. (One exception is Hughes and Nolan (1994), which assessed the value of distinguishing broad industry or occupational groupings as primary or secondary sector in explaining occupational pension entitlements). As Smyth (1996) points out, this is "primarily because of the lack of available information on pay, conditions and workforce characteristics among those working in different industries, firms and occupations". It also reflects, however, the extent to which the underdeveloped state of segmented labour market theory itself makes testing or application difficult. The purpose of this paper is to implement with Irish data empirical tests of the core element of the segmented labour market model, the divergence between sectors in the way earnings are determined. This serves two purposes. First, it provides a point of comparison between Ireland and

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[1] The roots of the segmented labour market model can be traced back to the work of Mill (1885) and Cairnes (1874) on "non-competing groups". Its modern development by Doeringer and Piore (1971), Gordon, Edwards and Reich (1982) and others owes much to the work of the American Institutionalists, Kerr (1954) and Dunlop (1957), on the balkanization of labour markets.

corresponding results for the USA and the UK, helping to highlight similarities and differences in labour market structures which may affect the potential role of segmentation. Secondly, it brings out difficulties inherent in testing dual or segmented labour market theory which proponents of these theories will have to overcome if they are indeed to be integrated into mainstream labour market theory.

For this purpose we use data on a large sample of employees obtained in the survey of income distribution, poverty and usage of State services carried out by the ESRI in 1987. Our empirical analysis is in two stages. In the first stage we test the dual version of the model in which the labour market is divided into only primary and secondary sector, and allocate individuals to these sectors on the basis of the broad industry group in which they work. The second stage tests a more complex version of the segmented model, developed by Gordon (1986) and refined by Waitzman and Smith (1994), in which the labour market is divided into four groups: independent primary professional and technical, independent primary craft, subordinate primary, and secondary sectors. Before describing this analysis, we describe in Section 2 the basic elements of the segmentation hypothesis and how it has been tested elsewhere, and the challenges faced in attempting to prove to the skeptic the value of the hypothesis

## 2. Segmented Labour Markets

*Segmented Labour Market Theory*

In the standard human capital competitive model of the labour market, earnings are a positive function of education and experience. Those on low earnings have low productivity, because they have been unable or unwilling to obtain the skills necessary to improve their productivity and earnings. As Hicks (1963) put it starkly, unskilled labour is "often badly paid, not because it gets less than it is worth, but because it is worth so appallingly little" (p. 82). Segmented labour market theory, by contrast, focuses on the characteristics of jobs rather than individuals in determining the distribution of earnings. In the simple version of this model there is a dual labour market consisting of a primary market, which pays high wages and provides significant rates of return to investment in education and employment experience, and a

secondary market, which pays lower wages and provides lower or zero returns to education or labour market experience. In Doeringer and Piore's (1971) influential formulation:

> ".... Jobs in the primary market possess several of the following characteristics: high wages, good working conditions, employment stability, chances of advancement, equity, and due process in the administration of work rules. Jobs in the secondary market, in contrast, tend to have low wages and fringe benefits, poor working condition, high labor turnover, little chance of advancement, and often arbitrary and carpricious supervision. There are distinctions between workers in the two sectors which parallel those between jobs: 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 in petty theft and pilfrage" (p.165-6).

The fact that primary sector jobs are rationed is central to the theory: the high pay of primary sector employees cannot be explained simply in terms of their higher quality, many secondary sector employees are capable of performing well in primary jobs but the rationing of access to good jobs denies them the opportunity to do so, the labour market does not clear (McNabb and Ryan 1990). The implications drawn for labour market policy emphasise that improving training and education will in itself be ineffective in increasing the earnings of secondary sector workers, so that policies aimed at directly influencing the structure of jobs come to the fore.

But if the higher earnings of primary sector workers are not attributable to their "quality", why are they not competed away - why does the market not clear? When this key question is asked, it becomes clear that segmented labour market (SLM) "theory" is itself a misnomer: within the segmented labour market perspective a variety of theories has been advanced, and Cain's (1976) judgement in the mid-1970s was that "the SLM theories are sketchy, vague and diverse if not internally conflicting" (p. 1221). The main theories underepinning a segmented labour market perspective he identified at the time included Thurow's (1975) "job competition theory", which saw the distribution of jobs as technologically determined and not influenced by workers' skills, wages are rigid, and workers queue at fixed wages; Doeringer and Piore's (1971) dual market theory, emphasising the way in which the growth of large firms and unions promoted internal labour markets weakly

connected to external markets; and radical dual market theories emphasising class-based employer strategies and the role of monopoly capitalism (Edwards, Reich and Gordon 1975). More recently, advocates of a segmented labour market perspective have appealed to efficiency wage theory where higher wages in the primary sector may enhance productivity, rent-sharing between employers and employees in highly-concentrated, high-profit or high-technology industries, or insider-outsider models emphasising the role of unions or the desire by employers to avoid unionisation (see for example Dickens and Lang 1993). Rather than a coherent, self-contained theory to be seen as an alternative to human capital theory, therefore, the segmented labour market perspective calls on a variety of possible theoretical underpinnings, and this agnosticism runs through much of the empirical literature.

*Testing the Segmented Labour Market Model*

It is central to the dual labour market appoach that returns to education and experience are lower in the secondary than in the primary sector. A popular test of the theory is therefore conducted through the estimation of separate earnings functions for the two sectors. If the segmented labour market model explains earnings data better than the competitive model then two wage equations or earnings functions should give a better fit to the earnings distribution than one. (As discussed below, this would not necessarily mean that primary sector jobs are rationed, the other central hypothesis of the dual labour market approach, and so does not constitute a comprehensive test: however, in the absence of diverging earnings functions the approach would not appear fruitful). Hence, a standard log earnings function is specified for each market to allow for these differences:

$$\ln w_p = XB_p + e_p$$
$$\ln w_s = XB_s + e_s$$

where w is earnings, X is a data matrix of variables relating to jobs and workers, B is a vector of coefficients, e is an error term, and p and s refer to the primary and secondary sectors.

In the primary market there is expected to be a strong positive relationship between earnings and education and earnings and work experience. In the secondary market these relationships are expected to be weaker or earnings is expected to show little association with increases in years of education or work experience. Figures 1 and 2, reproduced from Dickens

and Lang (1985), illustrate the difference between competitive and dual labour market hypotheses. Figure 1 shows what we expect to find when the log of the wage is plotted against education if the standard human capital model is correct. In this case a single regression line should give the best fit to the data. Figure 2 shows that if the labour market is segmented there should be two distinct relationships between wages and education, in which case two regression lines should give a better fit to the data than one. This type of test has been employed in a number of studies, including Osterman (1975), Wright (1979) and Carnoy and Rumberger (1980) for the USA, and by Mayhew and Rosewall (1979), McNabb and Ryan (1986), and McNabb (1987) for Britain. The crucial issue in implementing such a test, however, is how to allocate individuals to primary versus secondary sector in the first place. Interest in dual labour market theory waned in the late 1970s principally because of the stringent critique by Cain (1976), who pointed out that the way workers are classified as primary or secondary may itself bias the results in favour of the dual labour market hypothesis. If low wage itself is used as the basis for allocation to the secondary sector, for example, or occupations are classified as secondary sector because they offer low wages and used as the basis for allocation, then as Figure 3 shows even if there is in fact a single market estimated earnings equations for the two sectors will show lower returns to education in the secondary sector. In effect, the selection criterion for allocation to the primary and secondary sectors can result in the truncation of the secondary sector sample on the values of the dependent variable, biasing the results in favour of the dual hypothesis.

Various strategies have been adopted to deal with this problem. Heckman and Hotz (1986) allocate workers to primary and secondary sectors on the basis of the observed wage, but seek to directly correct for sample selection bias in their estimated equations using Heckman's (1979) technique. Dickens and Lang (1985) develop a procedure whereby individuals do not have to be allocated to the primary or secondary sector *a priori*, with a switching model determining the worker's sector estimated together with the two wage equations. Finally, efforts have been made to distinguish sectors in a manner which minimises any bias introduced in the estimated earnings equations. We follow the third route in this paper, because in our view it is the one which has the potential to link testing to an underlying theoretical perspective. Both the Heckman/Hotz and Dickens/Lang procedures

Figure 1: Hypothetical scatter plot - standard human capital model

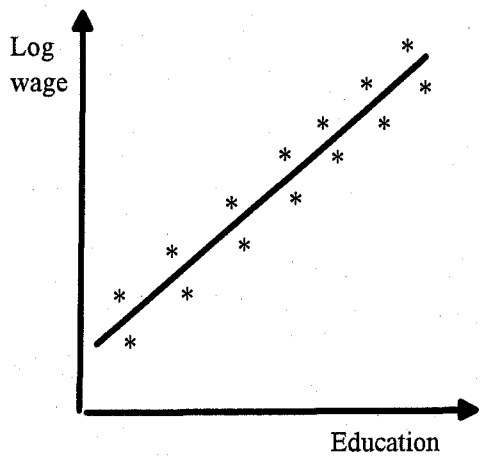



Figure 2: Hypothetical scatter plot - dual labour market theory

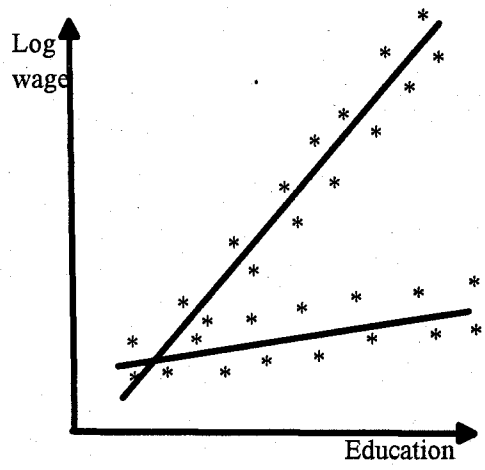
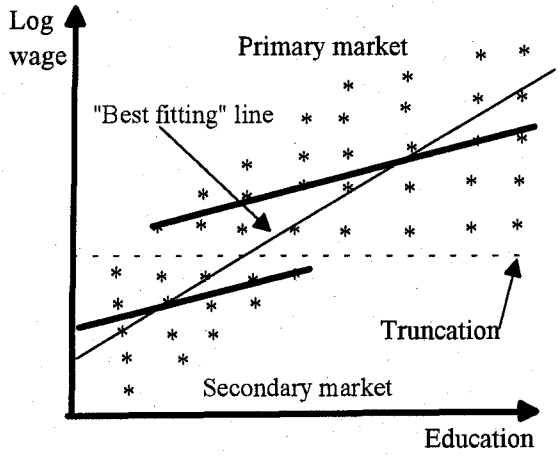



Figure 3: Example of bias imparted to regression T estimates of dual labour market modelth by truncated endogenous variable



are open to technical objections (as the comments they make about each other demonstrate), but we see a more fundamental problem which applies to both, arising from the theoretical agnosticism to which we referred earlier. None of the range of theoretical underpinnings for a segmentation hypothesis would simply identify low-wage and secondary sector jobs, as Heckman/Hotz do. Dickens/Lang's procedure determines sector within the model on the basis of individual characteristics, when the core notion common to segmented market theories is that it is job rather than individual characteristics which matter. Neither advances a theoretical explanation for segmentation, applies an allocation procedure consistent with that theory, and then tests the segmentation hypothesis on that basis. Our aim in this paper is to apply to Irish data tests of the segmentation hypothesis which have been employed in the literature and involve an *a priori* allocation into sectors which can be linked, whether loosely or more firmly, to an underlying theoretical perspective. In Section 4, we apply a primary/secondary allocation in terms of industry, while in Section 5 a more complex procedure distinguishing four sectors is applied. First, the data to be employed are described in the next section.

## 3 The Data

The segmented labour market model can be tested for Ireland using data from the ESRI survey of income distribution, poverty and usage of State services which was carried out in 1987 (and described in Callan, Nolan et al 1989, Nolan and Callan 1994). This survey provides information on the education and labour market experience of a national sample of the population resident in private households. Responses were obtained from a total of 3,294 households, an effective response rate of 64 per cent. The responding households were reweighted for analysis to correct for non-response bias, to ensure that the sample for analysis accords with the (much larger) Labour Force Survey in terms of four key characteristics: the number of adults in the household, urban/rural location, socio-economic group, and age of household head. Since the incomes of self-employed respondents include returns to capital as well as labour they are excluded from the analysis. Our attention is focused on the 2,002 employees who were included in sample households and on whom full information on earnings, education, labour market experience and other characteristics to be employed in the analysis was obtained.

In addition to all employees, results for heads of households are of interest for comparative purposes because Dickens and Lang's (1985) influential paper concentrates on this group for the USA. The twenty five and over age group is also of interest because segmentation theories suggest that someone who experiences secondary sector employment is more likely to experience it again. If this state dependence argument is correct we would expect that the relationships between earnings and education should be clearer for older workers than for all workers. Again for comparative purposes, we begin by estimating models consisting of only a core set of explanatory variables, namely marital status, years of education, and years of employment experience, which are similar to those employed by Dickens and Lang. We then extend to a full model, which incorporates in addition time spent out of work, part-time work, trade union membership, whether the individual is on an incremental pay scale, and pension entitlement variables. Part-time work is included in the model because this form of employment is more prevalent in the secondary sector and part-time workers are expected to have lower earnings. Trade union membership is included because industrial unionism has a homogenizing effect on job conditions, and this effect should be particularly strong in the primary sector in which most "goods producing" industries are found. Incremental pay scales are also a feature of primary sector employment, as is occupational pension entitlement, and these are included as additional control variables to take into account the fact that allocation between sectors is likely to be subject to error.

## 4. Testing an Industry-Based Dual Labour Market Categorisation

*Allocating Individuals to Primary and Secondary Sectors*

Our first set of tests apply to the relevance for Ireland of a distinction between primary and secondary labour market sectors, rather than a broader segmentation. In order to do so, our aim is to allocate workers between primary and secondary sectors in a way which minimises bias introduced by circularity via the definition of sectors in terms of earnings itself or variables highly correlated with earnings. In the standard human capital model, as Fleisher (1970) points out:

> "Industries are defined according to what is produced and, hence, economic theory implies that in equilibrium there should be no differences among wage rates for the same kind of labor according to industry per se except for working conditions that vary systematically among industries. On the other hand, classifying workers by occupation and/or skill is to classify them by characteristics which, according to economic theory, should be among the most important determinants of wage rates" (p. 206) .

We therefore employ in this section an allocation of individuals to primary or secondary sector on the basis of their industry of employment. Hughes and Nolan (1994) classified major groups of Irish industries as ones in which the majority of employees were likely to be working in the primary or secondary market, based principally on McNabb and Ryan's (1990) allocation for the United Kingdom. Their allocation depended on an analysis of sector characteristics, with concentration, plant size, and capital-intensity used as the main features distinguishing "core" from "periphery" sectors, and although the theoretical underpinnings need to be fleshed out the distinctions can at least be traced back to a theoretical emphasis on features of product markets likely to give rise to dualistic labour markets. The resulting allocation of major industrial groups to primary and secondary markets in Ireland is shown in Table 1. Applying this classification to the 1987 sample resulted in 1,463 employees being allocated to the primary market and the remaining 539 (27%) to the secondary market.

*Table 1: Allocation of major industrial groups to primary and secondary markets*

| **Primary market** | **Secondary market** |
|---|---|
| Other production | Agriculture |
| Insurance | Building and construction |
| Professional service | Wholesale |
| Teaching | Retail |
| Health | Personal service |
| Public administration | Other industries |

Source: Hughes and Nolan (1994).

Descriptive accounts highlight the fact that primary and secondary sectors differ in gender composition of the work force, the extent of part-time working, unionisation, employment stability, and ancillary benefits. Table 2 shows that applying the industry-based allocation procedure to the Irish data 41 per cent of workers in the secondary market are women, compared with 35 per cent in the primary market. It also shows that 62 percent of employees in the primary market belong to a trade union while only 19 per cent in the secondary market do so. The percentage working part-time (defined here as 18 hours or less per week) is 3 per cent in the primary market versus 8 per cent in the secondary market.

*Table 2: Percentage female, unionised, part-time, on incremental scales, with pension entitlement and average length of job in the primary and secondary markets*

| Major industrial group | % female | % Union Members | % part-time (18 hours) | % with pension entitlement | % on incremental scale | average length of job |
|---|---|---|---|---|---|---|
| Primary labour market | | | | | | |
| Other production | 24.8 | 58.6 | 0.9 | 44.6 | 27.4 | 7.5 |
| Insurance | 49.2 | 58.0 | 1.6 | 69.8 | 61.5 | 7.2 |
| Transport | 13.2 | 75.6 | 2.5 | 73.3 | 45.4 | 11.5 |
| Professional services | 58.5 | 20.0 | 4.0 | 30.0 | 35 | 7.4 |
| Teaching | 60.9 | 70.1 | 8.7 | 68.6 | 61.5 | 10.3 |
| Health | 75.8 | 55.4 | 6.9 | 58.2 | 44.3 | 6.9 |
| Public administration and defence | 26.0 | 69.0 | 1.0 | 79.3 | 59.8 | 9.4 |
| Total | 35.2 | 62.1 | 2.6 | 58.9 | 42.8 | 8.5 |
| Secondary labour market | | | | | | |
| Agriculture | 8.5 | 25.0 | 0.0 | 21.6 | 10.8 | 7.6 |
| Building and construction | 5.2 | 30.6 | 0.9 | 35.2 | 15.5 | 5.1 |
| Personal services | 65.4 | 14.2 | 16.9 | 10.4 | 16.3 | 4.9 |
| Wholesale | 21.6 | 18.6 | 1.1 | 36.0 | 32 | 6.4 |
| Retail | 48.8 | 19.2 | 8.3 | 12.7 | 19.7 | 4.8 |
| Other industries | 41.7 | 15.2 | 5.5 | 23.4 | 14.7 | 6.2 |
| Total | 40.9 | 19.3 | 7.9 | 18.5 | 18.5 | 5.3 |

. Source: 1987 ESRI survey

About 43% of primary sector workers are on an incremental pay scale, compared with 18% of those in the secondary sector. The percentage with entitlement to a retirement pension from their employer is very much higher in the primary sector, 59% versus only 18% in the secondary sector. From information obtained in the survey about the number of years the respondent spent in employment and the number of different employers they have had in their career, one can also derive the average length of each job. Table 2 shows considerably greater stability in the primary sector, with each job lasting an average of 8.5 years compared with 5 years in the secondary sector. In addition to information in the 1987 survey itself, Labour Force Survey data shows that unemployment rates are particularly high in some of the industry groupings we have categorised as secondary rather than primary, notably building and

construction.[2] All these characteristics tend to support the notion that, since the primary labour market contains jobs which require educational and training qualifications, it offers more stable, less precarious employment with better conditions, is more highly unionised, and has a higher percentage of "core" full-time male workers

*Regression Results for Dual Labour Market Pared Down Model*

We now present the results of a series of regression models which test whether the industry-based dual labour market distinction helps in understanding the determination of earnings in Ireland. The coefficients which will be of most interest in these regressions are those on the education and work experience variables. If the segmentation hypothesis is valid, the coefficients of the education and work experience variables should be lower in the secondary than in the primary sector. Table 3 presents regression results for the whole sample and for the primary and secondary markets for a pared-down model in which gross hourly earnings is regressed on marital status, years of education and years of employment. The regression coefficients for the whole sample have the expected positive signs and are all significant at the 95 per cent level. Gross hourly earnings increase with years of education and years of employment, and married respondents have higher earnings *ceteris paribus* than unmarried respondents as is commonly found. In the separate regressions for the primary and secondary markets the coefficients of the marital status, education, and employment experience variables have the same positive signs as in the regression for the whole sample and all three coefficients are again significant in both regressions. The coefficient on the education variable in the secondary sector is however smaller than in the primary sector, so the relationship between earnings and education is weaker in the secondary sector as predicted by the dual labour market model. Also consistent with the model, the goodness of fit of the primary sector regression is significantly better than the secondary sector regression: in the former the explanatory variables account for about 40 per cent of the variance in gross earnings while in the latter they account for less than 30 per cent. Contrary to the prediction of the segmented model, though, employment experience has a similar effect on gross hourly earnings in the two labour markets.

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[2] Clarke and Kavanagh (1995) apply our industry-based primary/secondary categorisation to 1992 Labour Force Survey data and present results on the male/female breakdown, extent of part-time working and unemployment rates (Table 5). However, their analysis covers all those at work, whereas ours is confined to employees. As a result their figures show 56% in the primary and 44% in the secondary market, compared with our 73/27% split: this is largely because they include all farmers in the secondary sector, whereas we include only farm employees.

*Table 3: Regression of earnings of employees on marital status, years of education, and years of employment for whole sample and for the primary and secondary markets*

| Variable | Whole sample | Primary market | Secondary market |
|---|---|---|---|
| Constant | 0.5835 | 0.7541 | 0.4691 |
| | (22.19) | (25.93) | (8.56) |
| Married | 0.2694 | 0.2264 | 0.2859 |
| | (11.24) | (8.88) | (5.76) |
| Years of education | 0.1036 | 0.0992 | 0.0720 |
| | (24.70) | (23.11) | (6.83) |
| Years of employment | 0.0178 | 0.0151 | 0.0178 |
| | (18.13) | (14.95) | (7.92) |
| Adjusted $R^2$ | .3922 | .3878 | .2816 |
| F | 431.4973 | 309.5446 | 71.4200 |
| Number of observations | 2,002 | 1,462 | 540 |

Following Fichtenbaum, Gyimah-Brempong and Olson (1994) we test if the regression results for the primary and secondary markets indicate the same underlying relationship. The null hypothesis is that there is no significant difference between the coefficients of the primary and secondary sector regression, which can be investigated using an F test. The F statistic is estimated by calculating the ratio of the difference between the restricted residual sum of squares (regression for whole sample) and the unrestricted residual sum of squares (regressions for primary and secondary markets) to the unrestricted sum of squares. This calculation gives F = 54.88 which is significant at the 5 per cent level. The hypothesis that the coefficients of the primary and secondary sector regressions are not significantly different from each other is not accepted.

An alternative method of testing the value of the distinction between the primary and secondary sectors is of course simply to estimate a single equation for the entire sample with slope and intercept dummies for membership of the secondary sector. When this is done the intercept dummy for membership of the secondary sector is not significant but both the interaction terms are, education with a negative sign as hypothesised but experience with a positive (though much smaller) coefficient. The explanatory power of the equation is enhanced by inclusion of the secondary sector variables. This is an alternative way of arriving at the same results, but since the approach consistently adopted in the literature on dual/segmented

labour markets has been to test via estimating separate earnings functions for different sectors, and since the single-equation approach becomes more unwieldy with more than two sectors, we concentrate on the separate equations approach.

Since Dickens and Lang's (1985) influential test of the dual labour market hypothesis for the USA was confined to male household heads, it is interesting to also estimate separate earnings functions for primary and secondary sectors for male household heads only in the Irish sample. This reduces our sample to 819 employees, of whom 80% were in the primary sector, and the results are shown in Table 4. The percentage of the variation in hourly gross earnings which is explained by marital status, years of education and years of employment is lower for all three regressions than was the case for all employees. The F test rejects the hypothesis that the coefficients of the primary and secondary sector regressions describe a common relationship which determines average gross hourly earnings, but there is little difference between the two sectors in the education and employment experience variables - the largest difference is in fact now for marital status. These results are in striking contrast to Dickens and Lang's, who found education and employment experience to be significant for the primary but insignificant for the secondary sector in the USA (though sector of attachment was in their case determined within the model). The Irish results for male household heads are thus much less supportive of the dual market hypothesis than those for the entire sample, using the industry-based sectoral categorisation.

*Table 4: Regressions of earnings of male household heads on marital status, years of education, and years of employment for the whole sample and for the primary and secondary markets*

| Variable | Whole sample | Primary market | Secondary market |
|---|---|---|---|
| Constant | 0.8391 | 0.9415 | 0.6630 |
| | (12.16) | (12.23) | (4.48) |
| Married | 0.2808 | 0.2448 | 0.3685 |
| | (4.80) | (3.81) | (2.85) |
| Years of education | 0.1036 | 0.1001 | 0.0946 |
| | (20.58) | (19.05) | (6.38) |
| Years of employment | 0.0090 | 0.0084 | 0.0078 |
| | (7.26) | (6.28) | (2.49) |
| Adjusted $R^2$ | .3534 | .3638 | .2291 |
| F | 150.0012 | 125.4939 | 17.2466 |
| Number of observations | 819 | 654 | 165 |

We also estimated this model for persons aged 25 and over to see if the results give any support to the state dependence argument of the segmented labour market model, that once the pattern of employment in primary or secondary sector is established subsequent mobility is limited, an implication being that the differences between the regression results for the two labour markets should become greater as workers grow older. There were 1,484 respondents aged 25 and over in the 1987 sample, of whom 78 per cent were working in primary sector industries and 22 per cent were employed in secondary sector industries. The regression results were similar to those for the entire sample seen in Table 3: the education coefficient for the secondary sector is lower than that for the primary sector, whereas the coefficient on years of experience is slightly higher. However, the percentage of the variance in gross hourly earnings which is explained by the equations, particularly for the secondary market, is much less. In the results for employees about 35 per cent of the variance was explained in the primary market and around 28 per cent in the secondary segment, whereas in the results for those aged over 25 only 32 per cent of the variance is explained in the primary market and less than 20 per cent in the secondary market. The sharper deterioration in the performance of the basic model for those in the secondary sector suggests that employment in the secondary sector is influenced by the respondent's previous work history. Persons whose early employment experience is in the secondary sector are more likely to be employed in this sector when they are older and the influence of education, work experience, and marital status on hourly gross earnings is likely to be much weaker than in the primary sector.

*Regression Results for Dual Labour Market Full Model*

Having worked so far with only a core set of explanatory variables, we now add to the earnings function a number of additional explanatory variables which may help to refine the estimates of the effects of the education and experience variables which are of central interest. these additional variables are time spent out of employment, male/female, distinct marital status variables for men and women, whether employment is full-time or part-time, trade union membership, incremental pay scale and pension entitlement. We also include the square of both time spent in employment and out of employment, to capture possible non-linearities in their effects. Categorising employees into primary versus secondary sector simply on the basis of industry is bound to mis-classify some of the sample, and full-time working, being on an incremental scale, pension entitlement and trade union membership are known to be associated

with membership of the primary rather than secondary sector: these variables are therefore likely to capture some of the influence of labour market dualism.

The results in Table 5 for the whole sample shows that gross hourly earnings have the positive association expected with education and labour market experience variables and that these and the other variables included in the regression explain 60 per cent of the variance in individual earnings. Employment experience and years out of employment have the expected positive and negative influences on earnings. Hourly earnings are higher for persons in part-time employment relative to those in full-time jobs. Trade union membership, being on an incremental scale and pension entitlement all have a strong positive association with earnings, as expected. Table 5 also presents the estimated earnings functions when the sample is divided into primary and secondary markets. An F test of the hypothesis that the coefficients of the variables in the two regressions come from a common model rejects that hypothesis. In both sectors the number of years employed has a strong positive effect on earniings although this effect does decline as years spent in employment increase. Years out of employment (in either unemployment or home duties) have a strong negative effect on earnings only in the primary sector, in the secondary sector it exerts no influence on earnings. Being female does not effect earnings in the primary sector whereas it has a strong negative effect in the secondary sector. Number of years of education exerts the expected strong postive influence on earnings in the primary sector, and a lower though still substantial effect in the secondary sector. Trade union membership, being on an incremental scale and entitlement to an occupational pension have positive effects on earnings in both sectors. The results for the full model thus confirm the results from the pared-down one that education exerts slightly less influence on earnings in the secondary sector than it does in the primary sector, as predicted by the segmented model. They also suggest that years out of the labour force has no effect on earnings in the secondary sector whereas it reduces earnings in the primary sector, which is also consistent with the dual market hypothesis, but that employment experience has the same impact in each sector, which is not consistent with the hypothesis.

*Table 5: Regressions of earnings of employees on full set of explanatory variables, full sample and primary and secondary sectors*

| Variable | Full sample | Primary market | Secondary market |
|---|---|---|---|
| Constant | 0.4512 | 0.5473 | 0.4500 |
| | (14.86) | (15.20) | (7.35) |
| Years employed | 0.0389 | 0.0389 | 0.0346 |
| | (13.25) | (11.71) | (5.92) |
| Years employed$^2$ | -0.0599 | -0.0594 | -0.0583 |
| | (9.92) | (8.85) | (4.53) |
| Years out of employment | -0.0218 | -0.0228 | -0.0143 |
| | (3.99) | (3.40) | (1.37) |
| Years out of employment$^2$ | 0.0574 | 0.0471 | 0.0528 |
| | (2.53) | (1.54) | (1.40) |
| Female | -0.0621 | -0.0046 | -0.1856 |
| | (2.34) | (0.15) | (3.82) |
| Married man | 0.1488 | 0.1245 | 0.2425 |
| | (5.21) | (3.94) | (4.01) |
| Married woman | 0.1256 | 0.0816 | 0.1685 |
| | (3.88) | (2.34) | (2.25) |
| Years of education | 0.0825 | 0.0830 | 0.0659 |
| | (21.55) | (20.65) | (6.83) |
| Part-time | 0.1457 | 0.1688 | 0.1604 |
| | (2.81) | (2.38) | (2.00) |
| Trade union member | 0.1316 | 0.0801 | 0.1615 |
| | (6.84) | (3.83) | (3.42) |
| Pension entitlement | 0.2880 | 0.2496 | 0.3344 |
| | (13.29) | (10.64) | (6.29) |
| Incremental scale | 0.1026 | 0.7575 | 0.1206 |
| | (5.17) | (3.59) | (2.53) |
| Adjusted $R^2$ | 0.5579 | 0.5282 | 0.4482 |
| F | 211.4439 | 137.314 | 37.4949 |
| n | 2,002 | 1,462 | 540 |

Overall, the results based on distinguishing between primary and secondary sectors on an industry basis suggest there may be some limited value to making that distinction, though the results are a great deal less clear-cut than tests of the dual market hypothesis from the USA. However, categorising employees into two sectors simply on the basis of industry provides at best a crude representation of the dual market hypothesis, since that hypothesis

refers to the characteristics of jobs rather than industries. Segmented labour market theories would see every industry having both "good" and "bad" jobs, with the balance between the two varying across industries, so distinguishing sectors on an industry basis alone will necessarily misclassify some, perhaps a substantial number, of employees by sector. Secondly, a simple dichotomy between primary and secondary sectors may be an over-restrictive formulation of labour market segmentation theory (as argued for example by McNabb and Ryan 1990). In the next section we therefore adopt a more refined approach to categorising employees by sector, based on applying the schema developed for the USA by Gordon (1986) to an Irish setting.

## 5 The Four-Sector Labour Market Model

*Gordon's Four-Sector Model*

The allocation of employees to core and peripheral segments in the models tested up to this point has been done at the one digit major industrial group level. A finer distinction between industries, and between occupations within them, in allocating jobs between labour market segments is desirable. The development of such a classification is a major undertaking as it requires detailed analysis and scoring of particular job characteristics. Detailed information on the characteristics of jobs included in each three digit occupation group is not available for Ireland. However, such data are available for the United States from the Dictionary of Occupational Titles and these have been used by Gordon (1986) to allocate U.S. census occupations to different labour market segments. Crucially from the point of view of testing the relevance of segmented labour market theory, the aim is to allocate on the basis of job rather than individual characteristics. The bias introduced into estimates of the earnings/education or earnings/experience relationship should therefore be minimised compared with categorisations by occupation in which the wage itself effectively plays a considerable role in deciding whether the individual is in the primary or secondary sector.

The occupation and industry data in the United States Census of Population 1980 and the Irish Census of Population 1981 are based on ISCO 68 - the International Standard Classification of Occupations (ISCO 68) and the second revision of ISIC - the International Standard Industrial Classification of All Economic Activities which was issued by the U.N. in 1968. One can thus use Gordon's classification scheme for the U.S. as a guide in classifying

the Irish data if one is prepared to assume that the characteristics of jobs with similar job titles in the two countries are similar. Gordon's (1986) classification, which is used to allocate census data for the United States into different labour market segments, has been updated by Waitzman and Smith (1994) and they have also made some small corrections to the 1980 census codes used in Gordon's classification.[3] Persons at work are divided into four segments - independent primary professional/technical, independent primary craft, subordinate primary, and secondary. The classification of occupations into labour market segments is based on a detailed analysis of the characteristics of jobs in the U.S. Dictionary of Occupational Titles. Three general imperatives were observed in devising the segments:

> "1. As much as possible the segment categories should refer to data about the characteristics of *jobs*, excluding information about the characteristics of the *workers* who hold those jobs.
>
> 2. As much as possible, similarly, the segment categories should build upon data which excludes information about final labour market outcomes, such as wages and turnover rates.
>
> 3. Given the importance of industrial characteristics in defining differences between "core" and "peripheral" firms and given the strong likelihood of job segmentation within core firms, it is important to take both industry and occupational characteristics into account." (Gordon 1986).

Industry and occupation data are used since data on firms is not available. This schema is used by Gordon, Edwards, and Reich (1982) to analyse the distribution of employment in the United States among labour market segments. Their analysis suggests that the distinction between goods-producing sectors and non-goods sectors is crucial because of the mediating influence of trade unions in goods-producing sectors in standardising job conditions across occupations. Outside these sectors trade unions had much less influence on the conditions of employment for different occupational groups within the non-goods producing sectors. In practical terms this means that for semi-skilled and unskilled "blue-collar" workers in goods-producing sectors the industry in which the person works determines allocation to the subordinate primary or secondary sector. In all other cases the person's occupation determines segment allocation. The results of a factor analysis of three-digit industries by Oster (1979)

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[3] We are grateful to David Gordon ot the New School for Social Research and Norman Waitzman of the University of Utah for providing us with detailed information on their classifications of labour market segments in the United States.

are used to divide all three-digit industries in the goods-producing sectors into "core" and "peripheral" industries. Gordon's approach is thus rooted in a theoretical perspective on the way particular features of the product market produce segmentation in the labour market, and is particularly thorough in devising a detailed schema to allocate jobs into these segments.

*Applying the Four-Sector Model to Ireland*

The allocation of respondents in the 1987 ESRI survey to different labour market segments was done as follows:

(a) Each of the 199 occupation titles in the Irish Census of Population 1981 were compared with the 499 occupation titles in the U.S. Census of Population 1980. A match was made between each occupation in Ireland and an occupation in the United States. The occupation in Ireland was then allocated to the same labour market segment as the segment to which the matching occupation in the U.S was allocated by Waitzman and Smith (1994). This resulted in an allocation of the employed labour force in Ireland to the four labour market segments independent primary, professional/technical, indpendent primary craft, subordinate primary, and secondary.

(b) Semi-skilled and unskilled occupations in goods-producing sectors in Ireland were identified on the basis of the match with corresponding jobs in the U.S.

(c) Each of the 37 core and 57 peripheral industries in the goods producing sectors in the U.S. were compared with the 199 Census industries for Ireland. A match was made between the 37 core industries in the U.S. and 37 core industries in Ireland and between 57 peripheral industries in the U.S. and 63 peripheral industries in Ireland.

(d) Semi-skilled and unskilled occupations in core and peripheral industries in Ireland were then allocated to the subordinate primary sector and secondary sectors respectively.

(e) To take into account the very different nature of public service employment in Ireland - with much higher levels of unionisation and job security than in the USA - jobs in the public sector which would in the US categorisation be in the secondary sector were reallocated to the subordinate primary sector.

The distribution of employees by sector in Ireland in 1987 given by Gordon's four-sector labour market classification (as amended) is shown in Table 6, together with a comparison of the distribution of employment in the United States in the same year. The two distributions are very similar, with about 25% in the secondary sector in each case. This is also very close to the size of the secondary sector produced by the two sector classification used in Section 4, but the actual allocation of jobs differs significantly between the two. Only about

60% of those in the secondary sector using the four-way categorisation were allocated to that sector by the industry-based classification.

*Table 6: Distribution of employment in four labour market segments in Ireland and the United States in 1987*

| Labour market segment | Ireland (%) | United States (%) |
|---|---|---|
| Independent primary professional and technical | 25.4 | 29.3 |
| Independent primary craft | 13.9 | 10.8 |
| Subordinate primary | 35.0 | 33.9 |
| Secondary | 25.7 | 26.0 |

Table 7 compares the characteristics of the four sectors in terms of the percentage of employees who are female, part-time, union members, on incremental scales, with pension entitlement, and the average length of job. This shows that the secondary sector has the highest proportion female and a much higher percentage part-time than the other sectors, the lowest proportion union members, on incremental scales and with pension entitlement, and the shortest average length of job - all consistent with descriptive accounts of the way the secondary sector differs from the rest of the labour market.

*Table 7: Percentage female, unionised, part-time, with pension entitlement and average length of job in four labour market segments in Ireland 1987*

| | % female | % union members | % part-time (18 hours) | % with pension entitlement | % on increment -al scale | average length of job (years) |
|---|---|---|---|---|---|---|
| Independent primary professional and technical | 37.3 | 54.0 | 2.2 | 70.5 | 52.7 | 9.95 |
| Independent primary craft | 10.4 | 51.4 | 0.0 | 45.0 | 31.3 | 7.43 |
| Subordinate primary | 38.9 | 61.4 | 2 | 55.8 | 38.3 | 7.05 |
| Secondary | 55.1 | 29.1 | 8.3 | 16.9 | 19.8 | 6.16 |

*Regression Results for the Four Sector Pared Down Model*

We now employ this four-way categorisation and assess the extent to which earnings functions differ across the sectors, beginning with the pared-down model. The regression results are presented in Table 8. The model explains nearly 40 per cent of the variance in average hourly earnings for the whole sample, about one-third for the independent primary professional and technical and the independent primary craft sectors but only 23 per cent for the subordinate primary sector and 17 per cent for the secondary sector. Being married has a significant positive effect on earnings in all four sectors but its influence is stronger for the three groups in the primary sector than for the secondary sector. Years of education has a significant positive effect on earnings in the three primary sectors but is now insignificant in the secondary sector. Years of employment have a similar positive effect on earnings in all four sectors, on the other hand, contrary to the segmented labour market model's prediction. The hypothesis that the coefficients in the regressions for the four labour market segments come from the same model as the coefficients for the whole sample is again rejected using the F test for stability of coefficients.

*Table 10: Regression of earnings of employees on marital status, years of education, and years of employment for the whole sample and for four labour market segments*

| Variable | Whole sample | Independent primary professional & technical | Independent primary craft | Subordinate primary | Secondary market |
|---|---|---|---|---|---|
| Constant | 0.5835 | 0.9920 | 0.8000 | 0.7626 | 0.7750 |
| | (22.19) | (16.10) | (11.18) | (16.18) | (14.13) |
| Married | 0.2694 | 0.1988 | 0.2356 | 0.2104 | 0.1432 |
| | (11.24) | (4.19) | (4.06) | (5.74) | (3.13) |
| Years of education | 0.1036 | 0.0845 | 0.0536 | 0.0794 | 0.0177 |
| | (24.70) | (12.49) | (3.74) | (9.30) | (1.65) |
| Years of employment | 0.0178 | 0.0155 | 0.0164 | 0.0137 | 0.0137 |
| | (18.13) | (8.76) | (6.75) | (8.58) | (7.29) |
| Adjusted $R^2$ | .3922 | 0.34 | 0.3394 | 0.2307 | 0.1734 |
| F | 431.4973 | 88.2342 | 48.4309 | 70.8895 | 36.9341 |
| N | 2,002 | 509 | 278 | 700 | 515 |

*Regression Results for Four Sector Full Model*

Once again we now add variables to capture the influence of time out of work, gender, part-time employment, trade union membership, incremental scales and pension entitlement and differentiating between married men and women to give the full four segment model, and the estimation results are shown in Table 9.

*Table 9: Regression of earnings on full set of explanatory variables for the whole sample and four labour market segments*

| Variable | Whole sample | Independent primary prof. & technical | Independent primary craft | Subordinate primary | Secondary sector |
|---|---|---|---|---|---|
| Constant | 0.4512 | 0.7499 | 0.5145 | 0.6316 | 0.6359 |
| | (14.86) | (9.44) | (6.70) | (11.48) | (10.64) |
| Female | 0.0389 | 0.0792 | 0.1469 | -0.1163 | -0.0968 |
| | (13.25) | (1.12) | (1.64) | (2.91) | (2.04) |
| Married man | -0.0599 | 0.1584 | 0.0334 | 0.0919 | 0.1344 |
| | (9.92) | (2.29) | (0.56) | (2.20) | (2.12) |
| Married woman | -0.0218 | 0.0453 | -0.1596 | 0.1172 | 0.1017 |
| | (3.99) | (0.73) | (1.28) | (2.31) | (1.73) |
| Years employed | 0.0574 | 0.0313 | 0.0573 | 0.0340 | 0.0266 |
| | (2.53) | (4.87) | (8.04) | (7.21) | (5.24) |
| Years employed$^2$ | -0.0621 | -0.0436 | -0.0931 | -0.0588 | -0.0406 |
| | (2.34) | (3.36) | (6.69) | (6.13) | (3.76) |
| Years out of employment | 0.1488 | -0.0289 | -0.0046 | -0.0225 | -0.0152 |
| | (5.21) | (2.11) | (0.23) | (2.71) | (1.69) |
| Years out of employment$^2$ | 0.1256 | 0.0982 | -0.0908 | 0.0538 | 0.0416 |
| | (3.88) | (1.48) | (0.97) | (1.62) | (1.17) |
| Years of education | 0.0825 | 0.0725 | 0.0562 | 0.0550 | 0.0249 |
| | (21.55) | (11.36) | (4.45) | (7.21) | (2.56) |
| Part-time | 0.1457 | 0.3464 | - | 0.0977 | 0.1530 |
| | (2.81) | (2.76) | | (0.97) | (2.23) |
| Trade union member | 0.1316 | 0.0557 | 0.0703 | 0.1365 | 0.2649 |
| | (6.84) | (1.44) | (1.67) | (4.63) | (6.50) |
| Pension entitlement | 0.2880 | 0.3151 | 0.2209 | 0.2383 | 0.2582 |
| | (13.29) | (6.88) | (4.89) | (7.25) | (5.26) |
| Incremental scale | 0.1026 | 0.0308 | -0.02 | 0.1106 | 0.1824 |
| | (5.17) | 0.81) | (0.47) | (3.70) | (4.12) |
| Adjusted $R^2$ | 0.5579 | 0.4552 | 0.5276 | 0.4584 | 0.3729 |
| F | 211.4439 | 36.3688 | 29.1212 | 50.3064 | 26.4711 |
| N | 2,002 | 509 | 278 | 700 | 515 |

Unlike the pared-down model in Table 8, years of education now has a significant positive impact on earnings in the secondary sector, but the coefficient is less than half those for the independent primary craft sector and the subordinate primary sector, which are in turn below that for the independent primary professional and technical sector. The F test for the full model again rejects the null hypothesis that there is no difference between the regression equations However, taking the coefficients on years of employment and the squared term together, once again the impact of experience is not much less in the secondary sector than elsewhere, contrary to the predictions of the segmented labour market model and some US evidence.

*Differences in Returns to Education and Work Experience*

The four segment labour market model provides a number of testable hypotheses relating to differences in the returns to education and work experience in each segment, as shown in Tables 10 and 11.Reading across the first row in Table 10, the segmented labour market model predicts that the returns to education in the independent primary professional and technical segment will be higher than in the independent primary craft, subordinate primary, or secondary segments. The second row indicates that the returns to education in the independent primary craft segment are indeterminate on theoretical grounds relative to the returns in the subordinate primary and secondary segments. The third row shows that the returns to education in the subordinate primary segment should be higher than in the secondary segment.

*Table 10 Predictions of returns to education in four labour market segments*

| Segment | IPPT | IPC | SP | SS |
|---|---|---|---|---|
| IPPT | * | + | + | + |
| IPC | | * | ? | ? |
| SP | | | * | + |
| SS | | | | * |

As far as work experience is concerned, Table 11 shows that the returns to work experience in the independent primary craft segment should be higher than in all of the other segments - mainly because earnings in craft occupations are strongly influenced by seniority. In addition, returns to work experience in the subordinate primary segment should be higher than in the secondary segment.

*Table 11: Predictions of returns to work experience in four labour market segments*

| Segment | IPPT | IPC | SP | SS |
|---|---|---|---|---|
| IPPT | * | - | + | + |
| IPC | | * | + | + |
| SP | | | * | + |
| SS | | | | * |

We can now test these hypotheses using the estimated returns to education and experience for the different sectors in the pared-down model in Table 8, and the results are shown in Tables 12 and 13. From Table 12 we see that the returns to education are indeed higher in the independent primary professional and technical segment than in the independent primary craft or the secondary segments, as predicted by the segmented labour market model, though they are not higher than in the subordinate primary segment (in the pared-down model). The returns to education in the subordinate primary segment are also higher than in the secondary sector as the model predicts.

*Table 12: Differences in returns to education in four labour market segments*

| Segment | IPPT | IPC | SPS | SS |
|---|---|---|---|---|
| IPPT | * | 0.0309 | 0.0051 | 0.0668 |
| | | (1.95) | (0.47) | (5.27) |
| IPC | | * | -0.0258 | 0.0359 |
| | | | (1.55) | (2.01) |
| SPS | | | * | 0.0617 |
| | | | | (4.50) |
| SS | | | | * |

Note: The t statistics are calculated by assuming that the sample variance of $(b_i-b_j)$ is equal to the variance of $b_i$ plus the variance of $b_j$ and that the covariance($b_i$, $b_j$) is zero.

*Table 13: Differences in returns to work experience in four labour market segments*

| Segment | IPPT | IPC | SP | SS |
|---|---|---|---|---|
| IPPT | * | -0.0008 | 0.0218 | 0.0018 |
| | | (0.01) | (0.91) | (0.10) |
| IPC | | * | -0.0027 | 0.0027 |
| | | | (0.94) | (0.88) |
| SP | | | * | 0.0001 |
| | | | | (0.04) |
| SS | | | | * |

Table 13 shows that none of the segmented labour market model's predictions in relation to returns to work experience are borne out. All of the tests reported in this table are insignificant. Work experience, therefore, has no differential effect on earnings in different labour market segments in Ireland whereas it has a strong differential effect in segmentation studies in the United States. In summary, the evidence support the predictions of the segmented model in relation to returns to education but not returns to work experience.

## 6 Conclusions

Dual or segmented labour market theory appears to be enjoying something of a resurgence internationally in recent years, but up to this point little attempt has been made to test or apply segmented labour market ideas in empirical work on the Irish labour market. This paper has implemented with Irish data empirical tests of the core element of the segmented labour market model, the divergence between sectors in the way earnings are determined. The analysis has been based on data for two thousand employees obtained in the 1987 ESRI survey on income distribution, poverty, and usage of state services. In testing segmented labour market theory the approach generally applied elsewhere has been to estimate earnings functions for different sectors and examine whether the predictions of that theory, that education and work experience have much less influence on earnings in the secondary sector than elsewhere, are borne out. Here we have carried out these comparisons for Ireland using two different approaches to allocating employees between sectors. The first is based on allocating major industrial groups to primary or secondary sector, whereas the second applies

the more refined procedure developed by Gordon for the USA, relying on detailed job descriptions in the Dictionnary of Occupational Titles, to distinguish four sectors.

The results for Ireland, with the two-way but much more emphatically with the four-way categorisation of labour market segments, suggested that returns to education were indeed less in the secondary sector than elsewhere, as predicted by the segmented labour market model. In addition, standard earnings functions explained less of the variance in earnings within the secondary sector than elsewhere. Contrary to the predictions of the segmented labour market model, years of employment experience were seen to have as great an influence on earnings in the secondary sector as elsewhere. The divergence in estimated earnings functions between sectors is a good deal less than that shown by a number of studies using US data, but results which have been produced for the UK suggest that there is also a less clear-cut divide there than in the USA (McNabb and Ryan 1990). Among the factors which may underpin this contrast, the greater influence of trade unions throughout the economy - including the secondary sector - in Ireland and the UK suggests itself as a prominent candidate given the importance placed by unions on rewards for seniority. The results for Ireland with the four-sector labour market categorisation provide a basis for concluding that the divergence across sectors in estimated returns to education, counter-pointed with the absence of such a divergence in returns to work experience, warrants further investigation.

To what extent do such findings challenge traditional human capital theory and influence the way one thinks about policy? As mentioned earlier, segmented labour market theory rests on two central tenets. The first, on which we have concentrated here, is that it is meaningful to distinguish a secondary sector with jobs which have low returns to education and experience, bad working conditions, unstable employment, and little opportunity for advancement. The second, however, is that jobs in the primary sector(s) are rationed, with substantial barriers to mobility out of the secondary sector. The key postulate here is that there are qualified individuals who would like to work in the primary sector but cannot get jobs there. If an individual can move out of the secondary sector to obtain returns on experience or education, then as Cain (1976) pointed out it does not much matter that there are no such returns in that sector. This is intrinsically very difficult to assess, and so far very few attempts

to do so directly have been made (Dickens and Lang 1985 being a notable exception). Longitudinal data on income and job mobility is clearly required and is becoming increasingly available, but as Dickens and Lang point out it is difficult to relate the emerging evidence on occupational or income mobility directly to the rationing hypothesis, because it is not clear how much mobility one would expect with/in the absence of rationing.

In the absence of such evidence on rationing, the existence of distinct wage equations for the primary and secondary sectors would not constitute a refutation of human capital theory. However the persistence of inter-industry and inter-employer wage differentials which cannot be explained by conventional human capital variables, documented in a variety of different ways in recent US studies such as Dickens and Katz (1987) and Krueger and Summers (1987, 1988), has itself contributed to the perceived need to augment human capital theory by, for example, efficiency wage or rent-sharing models (which have also been directed at understanding unemployment). The segmented labour market perspective offers an alternative framework within which such non-market-clearing models may fit, but will have difficulty convincing the skeptic to take it seriously without a more developed theoretical foundation. We have emphasised that, rather than a coherent theory, the segmented labour market perspective appeals to a variety of theories, and a theoretical agnosticism underlies some of the testing procedures which have been applied. In our view the priority for proponents of the segmented labour market perspective has to be development of the microfoundations of the postulated links between product market characteristics and segmentation in the labour market, on which more precise and testable propositions can be based.[4] This does not mean that a knock-out refutation of human capital theory will be required before segmentation can become a mainstream rather than a fringe perspective, but simply that a research programme which concentrates on development of its own underpinnings rather than on the limitations of human capital theory is more likely to be fruitful.

This matters because the implications of adopting such a perspective are markedly different from those of simple human capital theory on some central issues in labour market

[4] The unsatisfactory nature of the present position is demonstrates by the exchanges between Dickens and Lang (1985, 1993) and Heckman and Hotz (1986), which conclude that neither human capital nor segmented labour market theory are in essence testable empirically.

policy. The human capital model predicts that investing in education and training of those with low skills will itself significantly raise their earnings and reduce inequality. The segmentation model, however, sees workers at the lower end of the earnings distribution as having the lowest returns to investment in education and training and simply giving them more education and training will not alter the wage structure, suggesting a greater emphasis on policies directed at influencing the structure of jobs. The segmented labour market theory would also provide an alternative perspective on the impact of unemployment compensation and replacement rates on unemployment, as explored in for example Burda's (1990) model of "wait" unemployment and Atkinson and Micklewright's (1991) discussion of the impact of higher unemployment insurance coverage in the primary sector on the equilibrium wage and employment in that sector. At our current state of knowledge the main message of this paper's assessment of the relevance of segmented labour market theory to the Irish labour market is that this alternative perspective cannot be dismissed - and has exhibited considerable staying-power over a long period in different guises - but that much needs to be done to develop its theoretical foundations and investigate the evidence for its applicabilility outside the USA on which most research currently relies.

## REFERENCES


Atkinson, A.B. and J.Micklewright, 1991. "Unemployment Compensation and Labor Market Transitions: A Critical Review", *Journal of Economic Literature*, 29, 1679-1727.

Blackaby, D., K. Clark and D. Leslie, 1995. "Dual Labour Markets and the Potential Earnings of the Unemployed", *Scottish Journal of Political Economy,* 42 (1), 37-52.

Burda, M., 1990. "'Wait Unemployment' in Europe", *Economic Policy*, 7, 391-426.

Cain, G. 1976. "The Challenge of Segmented Labor Market Theories to Orthodox Theory: A Survey", *Journal of Economic Literature*, Vol. XIV, No. 4.

Cairnes, J., 1874. *Some Leading Principles of Political Economy.* London: Macmillan.

Callan, T., B. Nolan and B.J. Whelan, D.F. Hannan with S. Creighton 1989. *Poverty, Income and Welfare in Ireland,* General Research Series No. 146, Dublin: The Economic and Social Research Institute.

Carnoy, M., and R.Rumberger, 1980. "Segmentation in the US Labor Market: Its Effects on the Mobility and Earnings of Whites and Blacks", *Cambridge Journal of Economics*, 4, 117-132.

Clarke, C. and C. Kavanagh 1995. "Basic Income and the Irish Worker", in B. Reynolds and S. Healy eds., *An Adequate Income Guarantee for All: Desireability, Viability, Impact*, Dublin: CORI.

Dickens, W.T. and L.F. Katz, 1987. "Industry Wage Differences and Industry Characteristics", in K. Lang and J.S. Leonard eds., *Unemployment and the Structure of Labour Markets*, Oxford: Basil Blackwell.

Dickens, W. T. and K. Lang, 1985. "A Test of Dual Labor Market Theory", *American Economic Review,* Vol. 75, No. 4.

Dickens, W. T. and K. Lang 1993. "Labor Market Segmentation Theory: Reconsidering the Evidence", in W. Darity Jr. (ed.) *Labor Economics: Problems in Analyzing Labor Markets,* Boston/Dordrecht: Kluwer.

Doeringer, P. and M. Piore, 1971. *Internal Labor Markets and Manpower Analysis.* Lexington, Mass.: Heath Lexington Books.

Edwards, R., M. Reich and D. Gordon eds. 1975. *Labor Market Segmentation,* Heath: Lexington, Mass.

Fichtenbaum, R., K. Gyimah-Brempong, and P. Olson, 1994. "New Evidence on the Labour Market Segmentation Hypothesis", *Review of Social Economy*, Vol. LII, No. 1.

Fleisher, B. M., 1970. *Labor Economics: Theory and Evidence.* Englewood Cliffs, New Jersey: Prentice-Hall, Inc.

Gordon, David M., 1986. *Procedure for Allocating Jobs Into Labor Segments*, New School for Social Research (mimeo.).

Gordon, David M., R. Edwards, and M. Reich, 1982. *Segmented Work, Divided Workers: The Historical Transformation of Labor in the United States.* Cambridge: Cambridge University Press.

Heckman, J.J., 1979. "Sample Bias as a Specification Error", *Econometrica*, 47 (1), 153-62.

Heckman, J.J. and J.V. Hotz, 1986. "An Investigation of the Labor Market Earnings of Panamanian Males: Evaluating the Sources of Inequality", *Journal of Human Resources*, 21, 507-542.

Heckman, J.J. and G. Sedlacek, 1985. "Heterogeneity, Aggregation and Market Wage Functions: An Empirical Model of Self-Selection in the Labor Market", *Journal of Political Economy*, 93, 1077-1125.

Hicks, J.R., 1963. *The Theory of Wages*, London: Macmillan.

Hughes, G., and B. Nolan, 1994. "Retraites et structure du marche du travail: les enseignements du cas Irlandais", *La Revue de L'Ires*, No. 15, Ete.

Krueger, A. and L. Summers, 1987. "Reflections on the Inter-Industry Wage Structure", in K. Lang and S.J. Leonard eds., *Unemployment and the Structure of Labour Markets*, Oxford: Basil Blackwell.

Krueger, A. and L. Summers, 1988. "Efficiency Wages and Inter-Industry Wage Structure", *Econometrica*, 56, 259-93.

Mayhew, K., and B. Rosewell, 1979. "Labour Market Segmentation in Britain", *Oxford Bulletin of Economics and Statistics*, Vol 41, No. 2.

McNabb, R., 1987. "Testing for Labour Market Segmentation in Britain", *Manchester School*, Vol. LV, No. 3, 257-73.

McNabb, R., and P. Ryan, 1990. "Segmented Labour Markets", in D. Sapsford and Z. Tzannatos (editors), *Current Issues in Labour Economics*. London: Macmillan.

Mill, J. S., 1885. *Principles of Political Economy.* New York: Appleton.

Nolan, B. 1993. *Low Pay in Ireland*, General Research Series Paper No. 159, Dublin: The Economic and Social research Institute.

Nolan, B. and T. Callan, eds. 1994. *Poverty and Policy in Ireland*, Dublin: Gill and Macmillan.

Oster, G., 1979. "A Factor Analytic Test of the Dual Economy", *Review of Economics and Statistics*, 61, 33-51.

Osterman, P. "An Empirical Study of Labor Market Segmentation", *Industrial and Labor Relations Review*, 28, 508-523.

Smyth, E., 1996. "Labour Market Structures and Women's Employment in Ireland" in M. Leonard and A. Byrne (editors), *Women in Ireland: A Sociological Perspective*. Dublin : Attic Press (forthcoming).

Thurow, L., 1975. *Generating Inequality,* New York: Basic Books.

Waitzman, N. J., and K. R. Smith, 1994. "Procedure for Allocating Workers by Occupational Segment" Appendix to "The Effects of Occupational Class Transitions on Hypertension: Racial Disparities in a Cohort of Working-Aged Men", *American Journal of Public Health.*

Wright, E. O., 1979. *Class Structure and Income Determination*, New York: Academic Press.