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### Abstract

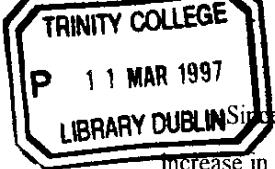
In this paper we investigate the build-up in male long-term unemployment by allowing for heterogeneity both in the unemployment inflow and conditional survival rates. We construct a consistent semi-annual series of the male flows into and out of the Irish Live Register for the period 1967 to 1995 and develop a methodology that allows us to decompose the unemployment inflow by age and unemployment scheme and the unemployment outflow by duration of spell, age and unemployment scheme. Our results in conjunction with other evidence indicate that it was heterogeneity in the unemployment inflow caused by the changing occupational structure of employment over the 1980s that caused the build-up and persistence of male long-term unemployment in Ireland.

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## Introduction

Since the 1980s Ireland has experienced a large and persistent increase in male Long-Term Unemployment (LTU), i.e. of those who have been unemployed for more than a year. This leads one to ask the following questions. Who are the long-term unemployed in Ireland? And, why did the males that entered the unemployment pool, particularly during the 1980s, remain there for very long durations? One popular explanation is based on the unemployment state dependence thesis, see for instance Layard et al (1991). Accordingly, a downturn in the business cycle increases the flow of workers into the unemployment state. As the spell of unemployment increases an individual's human capital, or perceived human capital, can depreciate. A pro-longed recession can lead to disenfranchising individuals from the labour force by extending the duration of their unemployment spell. This creates an ineffective portion of labour supply which in turn creates wage pressure in a recovery period and causes unemployment to persist.

Another competing theory is based on the heterogeneity of the unemployed. Specifically, those that remain in the unemployment pool for long durations are inherently different from those that experience short spells. One possible cause of heterogeneity in the characteristics of individuals that flow in to unemployment are changes in the structure of employment. Institutional changes, the globalisation of trade and technology advancement can induce important structural changes in the sectoral composition and the occupational structure of employment which can lead to the separation of older, unskilled individuals, with few or no educational qualifications, from the employment state that have lower re-employment probabilities than others flowing in to unemployment. The sunk costs associated with the training and re-building of older human

capital and the limited duration of return in the investment may lead firms to exclude these individuals from the effective labour force even if, as a consequence, they incur higher wage costs. Thus, under this scenario human capital is not unemployment but employment state dependent. In other words it is not the duration of the unemployment spell but the nature of the prior employment spell that creates an ineffective labour supply. In addition, it is not the business cycle per se but structural changes in employment over the business cycle that causes LTU.

Both of the theories described above suggest that LTU spells are not voluntary. It however also popular to argue that, while business cycles and structural change do increase the unemployment inflow, it is the generosity of the Irish welfare system and the high taxation of employment that induces many individuals to become part of an unemployment culture. Given their employment possibilities these individuals, in contrast, choose to stay long-term unemployed. Due to the lack of studies on the causes of LTU the relative importance of these theories in the Irish context is not clear. While the characteristics of the long-term unemployed are well documented, as for instance recently by the Department of Enterprise and Employment (1996), the origin of the long-term unemployed is not. Studies like Breen and Honohan (1991) and Harrison and Walsh (1994) assume a homogenous inflow of workers in their analysis of LTU. Both of these papers find relatively constant duration specific hazard rates over the 1980s. This would suggest that the aggregate trends in the LTU are pushed by increases in the unemployment inflow and not changes in the conditional hazard rates. However neither of these papers allows for unemployment heterogeneity in their analysis. O'Mahony (1983), on the other hand, rejects the hypothesis of heterogeneity as the prevalent cause of long-term unemployment in the 1970s.

In the present paper we investigate the build-up in male LTU by allowing for heterogeneity both in the unemployment inflow and conditional survival rates.<sup>1</sup> In Section I, we construct a consistent semi-annual series of the male flows in to and out of the Irish Live Register for the period 1967 to 1995 using the methodology of Harrison and Walsh (1994). Subsequently, in Section II, utilising the information embodied in the inflows and information embodied in the duration specific stocks of the Live Register, we develop a methodology that allows us to decompose the unemployment inflow by age and unemployment scheme and the unemployment outflow by duration of spell, age and unemployment scheme. Our results in conjunction with other evidence indicate heterogeneity in the unemployment inflow to be a cause of the build-up of LTU. In Section III, we use our results of the unemployment flow decomposition to argue that it was heterogeneity in the unemployment inflow caused by the changing occupational structure of employment that caused the persistence in LTU. We state our conclusions in the final section.

### Section I: Construction of the Flow Data

Information on the flows of individuals in to and out of the Irish Live Register is not available from official data sources before 1983. In this section we construct a consistent semi-annual series of flow data using an approach similar to that of Harrison and Walsh (1994). Fundamental to the construction methodology is the following identity which relates the

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<sup>1</sup> Even though females are playing an ever increasing role in the build up in long term unemployment, the fact that they were subject to different institutional and legislative settings, would make a separate analysis necessary. See Harrison et al (1995) for a review of the institutional and legislative setting for females in the Irish labour market.

stock of unemployed at time  $t+1$  ( $TU_{t+1}$ ) to the stock of unemployed at time  $t$  ( $TU_t$ ), the total number of entries to the Live Register ( $I_{t \rightarrow t+1}$ ) and the total exits from the Live Register ( $O_{t \rightarrow t+1}$ ) during the intervening period:

$$(1) \quad TU_{t+1} = TU_t + I_{t \rightarrow t+1} - O_{t \rightarrow t+1}$$

where  $t \rightarrow t+1$  denotes the six-month period between time points  $t$  and  $t+1$ . The precise time points used for the total number of unemployed,  $TU_t$ , are the last Friday of May and November of each year up to 1979 and the second last Friday of April and October in each year from 1980 to 1995. Clearly, given the overall inflows,  $I_{t \rightarrow t+1}$ , in to the Live Register during each of these six months intervals, and a five month interval in the case of the period November 1979 to April 1980, it follows from (1) that the corresponding overall gross outflows may be determined using the identity:

$$(2) \quad O_{t \rightarrow t+1} = I_{t \rightarrow t+1} - \Delta TU$$

where  $\Delta TU = TU_{t+1} - TU_t$  is the change in the stock of unemployment over the interval between time points  $t$  and  $t+1$ . Thus our attention focuses on the construction of a consistent semi-annual series for  $I_{t \rightarrow t+1}$ , commencing in November 1966 and ending in April 1995.

The gender specific count of newcomers to the Live Register has been published by the Central Statistics Office on a monthly basis since January 1983. The counts for this series were undertaken on the second Friday of each month up to 1989. As such they underestimate the total inflow in to the Live Register since some newly unemployed individuals have up to the full month, and others as little as one day, to leave the Register and thus may not be present in the count. Since 1989 the counts for this series were undertaken on the last Friday of each week and newly unemployed individuals would have up to a week to leave the Register.

Nevertheless, we feel that the majority of the monthly inflows is well-captured by the CSO figures for the period 1983 to 1995. To construct a semi-annual series for the inflows in to the Live Register which corresponds with the time-points of the stock of unemployment data in April and October, we assume that the monthly inflows accumulate at a uniform weekly rate. The CSO monthly figures can then be aggregated and the appropriate adjustments made for the weeks at the beginning and end of each six-month interval as defined by the unemployment stocks.

Construction of the required inflows for the earlier part of our sample is more problematic as no CSO monthly inflow data are available. Indeed, due to constraints relating to raw data availability, our method of construction had to be modified for two earlier sub-periods, namely, the periods November 1966 to November 1979 and November 1979 to April 1983. For the former period, we made use of the CSO's quarterly unemployment duration analysis, excluding those aged 65 years and over. This analysis is based on duration specific stock data collected on the last Friday of February, May, August and November in each of the relevant years. We assume that the under five weeks unemployment duration categories in August and November of each year are representative of the same category in June and July and September and October, respectively, of the same year. The semi-annual inflow for the period from the end of May to the end of November in each year was constructed as the sum of 3.25 times the number of individuals unemployed in the under five weeks unemployment duration category in August and November. Similarly the semi-annual inflow for the period from the end of November to the end of May of the following year was constructed by summing 3.25 times the

number of individuals unemployed in the under five weeks unemployment duration category in February and May of that period.<sup>2</sup>

For the remaining sub-period in the sample, namely, the bridging period November 1979 to April 1983, only semi-annual duration analysis is available from CSO sources. We assume that the under five weeks unemployment duration category in October and April of each year is representative of the same category in the other five months of the six-month intervals April to October and October to April, respectively. The semi-annual inflow for these periods in each year were constructed as 6.5 times the number of individuals unemployed in the under five weeks unemployment duration category of the respective representative months. The one exception to this rule was the five month period between November 1979 to April 1980 where the under five weeks duration category in April 1980 was only multiplied by 5.5. While our procedure of construction for the period 1966 to 1983 will produce errors in the estimation of the exact number of newcomers, the general trends and levels should be representative and the series should be consistent with the estimates of newcomers to the Live Register for the period April 1983 to April 1995.

The stock of unemployment and the constructed overall semi-annual inflows and derived outflows are plotted in Fig. 1. It must be realised at this point that the stock is a measure which can accumulate over time while the inflow and outflow are period specific. Any change in the semi-annual unemployment stock level arises when the inflow does not equal the outflow over any six month interval. Since the late 1960s, the stock has

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<sup>2</sup> No count was available for May 1970, February 1971, May 1979 and August 1979. To estimate the inflow for the six month intervals affected,

mainly been on an upward trend except for two three year periods in the late 1970s and in the late 1980s. This resulted from flow activity in which inflows were generally greater than outflows. The flows in the late 1960s and early 1970s had approximately 40,000 entries and 40,000 exits over each six month interval. The flow activity from 1980 onward has almost persistently increased. By the early 1990s the flows, approximately 120,000 entries and 120,000 exits over each six month interval, were three times the flows in the early 1970s. The trends in the stock and the flows highlight the fact that the incidence of completed and uncompleted spells of unemployment have persistently increased for males over time.

It is apparent from Fig. 1 that the turnover, i.e. the sum of the inflow and outflow, has been quite substantial over the entire sample period, especially in periods where there was a large build-up in the stock. In fig. 2 we depict the minimum number of unemployment state transitions necessary to induce the changes in the total stock, which is just the absolute value of the change in the unemployment stock,  $|\Delta TU|$ , versus the actual number of unemployment state transitions taking place, which is the sum of entries and exits to the unemployment state. Accordingly, the gap between the actual versus the minimum number of unemployment state transitions has increased substantially since the late 1960s.

The observed turnover can of course be either due to a small number of individuals experiencing many unemployment state transitions within a six month period or could consist of different individuals entering and exiting the unemployment pool. Due to the absence of information on recurrent spells within a six month period we can only calculate the upper and lower bound of the number of different individuals experiencing

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the count of individuals in the under five weeks unemployment category of the other relevant month that was available was multiplied by 6.5.

unemployment state transitions. We define the upper bound,  $\text{Max}_{t \rightarrow t+1}$ , as the following:

$$(3) \quad \text{Max}_{t \rightarrow t+1} = I_{t \rightarrow t+1} + O_{t \rightarrow t+1} - O_{t \rightarrow t+1}^{\text{NC}}$$

where  $O_{t \rightarrow t+1}^{\text{NC}}$ , the newcomer outflow, is the outflow of individuals who entered unemployment in the period  $t$  to  $t+1$  and is calculated via the following identity:

$$(4) \quad O_{t \rightarrow t+1}^{\text{NC}} = I_{t \rightarrow t+1} - S_{t+1}$$

where  $S_{t+1}$  is the stock of those unemployed under six months at the end of the six month period.

$\text{Max}_{t \rightarrow t+1}$  serves as an upper bound by implicitly assuming that those in the gross outflows do not re-enter unemployment over the same six month interval and thus would not be present in  $I_{t \rightarrow t+1}$ , and by realising that a newcomer entry and exit together must account for a single individual. In order to calculate the lower bound we assume the maximum possible number of recurrent spells. Thus the lower bound of the number of different individuals experiencing unemployment state transitions,  $\text{Min}_{t \rightarrow t+1}$ , is defined by the following:

$$(5) \quad \text{Min}_{t \rightarrow t+1} = O_{t \rightarrow t+1} - O_{t \rightarrow t+1}^{\text{NC}} = O_{t \rightarrow t+1}^{\text{IN}} \quad \text{if } O_{t \rightarrow t+1} \geq I_{t \rightarrow t+1}$$

$$\text{Min}_{t \rightarrow t+1} = I_{t \rightarrow t+1} - O_{t \rightarrow t+1}^{\text{NC}} - O_{t \rightarrow t+1}^{\text{IN}} + O_{t \rightarrow t+1}^{\text{IN}} = S_{t+1}$$

$$\text{if } O_{t \rightarrow t+1} < I_{t \rightarrow t+1}$$

where we define the total outflows net of newcomer outflows as incumbent outflows,  $O_{t \rightarrow t+1}^{\text{IN}}$ , i.e. the exits from unemployment over the six month interval  $t$  to  $t+1$  of individuals who entered unemployment prior to this interval. When total outflows are greater than total inflows then the minimum number of individuals that can account for the unemployment transitions is equal to the incumbent outflow as all inflows could potentially be recurrent spells of just these individuals. If however

potentially be recurrent spells of just these individuals. If however outflows are less than inflows then the minimum number of individuals accounting for the unemployment transitions is greater than the number of individuals as represented by the incumbent outflow,  $O_{t \rightarrow t+1}^{\text{IN}}$ . The minimum number individuals in this scenario is the sum of the inflow in excess of total outflow and the incumbent outflow, which, by definition, leaves us with the short-term stock taken at  $t+1$ ,  $S_{t+1}$ .

In Fig. 3 we plot the upper and lower bound of the number of different individuals experiencing these transitions. This reveals that even when we account for the maximum number of recurrent spells a substantial proportion of the unemployment dynamics, within a six month interval, is determined by a large number of different individuals.

Some interesting features of Irish unemployment arise from our analysis. Since the 1960s the male unemployment stock, inflows and outflows have increased substantially. We find the number of transitions have increased radically with the build-up in the stock and these are due to an increasing number of different individuals making transitions to and from unemployment within six month intervals. Moreover, as noted in the introduction, most of the build up in the stock is due to a build up of LTU. This suggests that, particularly since the 1980s, there may have been differences between those that enter and exit and those that enter and remain in the unemployment pool. In order to investigate this we examine those in the unemployment flows by age, unemployment scheme and their duration of unemployment spell in the next section.

## Section II: Decomposition of Flows by Characteristics

The inflows in to the Live Register, either as provided by the CSO or as constructed in Section II, are only given as totals. However, the

duration specific stocks of the CSO Live Register set are broken down both by age and unemployment scheme and thus we use these to estimate the proportion of the inflows over each six month interval by age and unemployment scheme. In particular, we outline a procedure to construct the semi-annual inflows in to unemployment by characteristic  $i$  and/or  $j$ ,  $I_{ijt \rightarrow t+1}$ , where  $i$  = age and  $j$  = unemployment scheme.

The duration specific stocks of the CSO data set are decomposed by those on Unemployment Assistance (UA), those on Unemployment Benefit (UB) and those on the Live Register registered for neither scheme, i.e. those classified as "Other". We choose to group those in the "Other" category with those on UB because many of those in the "Other" category would essentially be 'signing on' so as to qualify for UB later. For convenience sake we will refer to the sum of these two groups as UB. The methodology we employ for decomposing the overall inflow into specific characteristics rests on the simple assumption that the proportions of these groups in the refined duration specific stock categories of our sample months reflect closely the shares of these groups in the overall inflow for the six month interval in question. More precisely, in order to estimate the components of the total inflow on either UA or UB we, for the six month intervals starting on the last Friday of November in 1966 up to the last Friday of November in 1979, weighted the semi-annual inflow by the proportions of each unemployment scheme in the under 5 weeks category in the representative months used in the construction of the total inflow. Similarly, in the six month intervals starting in November 1979 up to the last Friday of October 1988 we used the proportions of each unemployment scheme in the under five weeks duration category stock in April and October. Finally, in the six month intervals starting in October 1988 up to the last Friday of April 1995 we used proportions of each

unemployment scheme in the under 3 months duration category stock in April and October.<sup>3</sup>

In seeking to decompose the unemployment inflows by age we are constrained by the fact that the age decomposition in the duration analysis data set was only initiated in 1980. As with the decomposition by unemployment scheme, the decomposition of the total unemployment inflow by age for the period April 1980 to April 1995 also rests on the simple assumption assumption that the proportions of these groups in the refined duration specific stock categories of our sample months reflect closely the shares of these groups in the overall inflow for the six month interval in question. Up to the last Friday of October 1988 we used the over and under 25 years of age proportions of the under five weeks duration category stock in April and October to weight the overall male inflows. For reasons given above, we used the over and under 25 years of age proportions in the under three months duration stock in April and October to weight the inflows for the remainder of our sample period. We can similarly decompose the total inflow by both age and unemployment scheme from 1980 onwards.

Even though the Live Register data set can, given the inflows, be used as in (1) to derive total outflows from the Live Register, it does not however allow one to explicitly decompose the outflow series in to categories of the duration of the spell experienced. To do such we make use of two sources of information, the semi-annual inflows in to the Live Register and the corresponding duration specific stocks. The former are

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<sup>3</sup> We were limited to this less refined weighting as the Live Register data set changed to no longer include duration categories below that of under 3 months.

derived as outlined above and the latter are available as part of the Live Register data set.

For expositional ease we only outline how to decompose the total outflow into the outflow from the under 6 months duration category,  $S_t$ , the short-term unemployed, from the between 6 and 12 months duration category,  $M_t$ , the medium-term unemployed and the over 12 months duration category,  $L_t$ , the long-term unemployed without further decomposition by age and/or unemployment scheme. However, this methodology can easily be extended to characteristic specific outflows by using the corresponding characteristic specific duration stocks and inflow.

Over any six month interval  $t \rightarrow t+1$  we distinguish between two cohorts of individuals that can potentially outflow from the short term unemployment pool. First, all newcomers to the Live Register in the interval  $t \rightarrow t+1$ ,  $I_{t \rightarrow t+1}$ , may outflow over the six month interval. Since we know that any individual in the short-term stock  $S_{t+1}$  must have been part of  $I_{t \rightarrow t+1}$ <sup>4</sup>, this newcomer outflow,  $O_{t \rightarrow t+1}^{NC}$ , is calculated as in equation (4).

In addition to the newcomers those incumbent to the short-term pool as captured by the short term unemployment stock at the start of the six month interval,  $S_t$ , can also potentially outflow from this pool prior to  $t+1$  and prior to spilling over into the medium-term unemployment pool. The construction of this part of the short-term outflow however is more problematic. The duration specific stocks of the Live Register allows one to calculate the fraction of this incumbent cohort that remains at  $t+1$  as portrayed by the difference between  $S_t$  and  $M_{t+1}$ . The difficulty arises

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<sup>4</sup> Any individual who was part of the  $S_t$  stock would, if still unemployed, be in the medium-term unemployment pool since the short- and medium-term pools by definition empty out over time.



when one wishes to calculate the fraction of these leaving the Live Register conditional upon being short-term unemployed. In constructing the short-term unemployment incumbent outflow we do know that it will be some fraction of the original stock,  $S_t$ . We thus define the outflows from short term unemployment over the time interval  $t \rightarrow t+1$  as the following:

$$(6) \quad O_{t \rightarrow t+1}^S = (I_{t \rightarrow t+1} - S_{t+1}) + \lambda_t S_t$$

where the term in the parentheses on the right hand side is the outflow of newcomers from short-term unemployment over the six month interval,  $O_{t \rightarrow t+1}^{NC}$ . The second term,  $\lambda_t S_t$ , is the fraction of the incumbent stock,  $S_t$ , that outflowed over the interval  $t \rightarrow t+1$  while still in the short-term pool. The average probability of outflowing from the short term pool as an incumbent,  $\lambda_t$ , is unknown but we proxy it with the following. Since we know that the average probability of outflowing from the short term pool as a newcomer,  $\theta_t = (I_{t+1} - S_{t+1}) / I_{t \rightarrow t+1}$ , during the same period, we make the assumption that the incumbent average probability of outflow,  $\lambda_t$ , is proportional to  $\theta_t$ . However, because the incumbents  $S_t$  essentially already had at least some chance, some up to six months and others as little as a day, to outflow over the prior period  $t-1 \rightarrow t$  and failed to do so, one might expect the probability of outflowing from the short term pool to be lower for incumbents. To correct for this potential bias in levels then,  $\theta_t$  is weighted by the ratio of the subset of those who remained incumbent to the newcomers in the prior six month interval,  $S_t / I_{t-1 \rightarrow t}$ . Hence, we take account of the evolutionary path of the unemployed and also allow for period specific conditions to have an effect. If, for example, newcomers to the Live Register over  $t-1$  to  $t$  remained for longer durations in short-term unemployment, then a larger proportion of the newcomers will be

accounted for at  $t$  and the level of the newcomer hazard rate over to  $t+1$  will more accurately reflect the level of hazard rate for incumbents. Thus we estimate the percentage of  $S_t$  exiting unemployment from the short-term unemployment pool over the six month interval  $t \rightarrow t+1$  as the following:

$$(7) \quad \lambda_t \approx \theta_t \cdot (1 - \theta_{t-1})$$

which makes equation (6) operational.

One can construct the outflow from the medium-term unemployment pool in a similar manner as that from the short-term unemployment pool. The medium-term outflow over any interval  $t \rightarrow t+1$  can again come from two different cohorts of individuals: the newcomers to the medium-term unemployment pool and those already incumbent to the medium-term pool at the beginning of the time interval as the medium-term stock,  $M_t$ . The group of newcomers to the pool over the interval  $t \rightarrow t+1$  are simply the proportion of  $S_t$  that are estimated to have failed to outflow from the short term pool:

$$(8) \quad I_{t \rightarrow t+1}^M \approx (1 - \lambda_t) \cdot S_t$$

We estimate the total outflow from the medium-term pool over the interval  $t \rightarrow t+1$  to be the following:

$$(9) \quad O_{t \rightarrow t+1}^M = (I_{t \rightarrow t+1}^M - M_{t+1}) + \lambda_t^* M_t$$

where  $(I_{t \rightarrow t+1}^M - M_{t+1})$  is the estimated outflow of newcomers and  $\lambda_t^* M_t$  is the estimated outflow of incumbents in the medium-term pool that flow out while classified as medium-term unemployed. The probability of an incumbent outflowing from the medium term pool before the end of the interval  $t \rightarrow t+1$ ,  $\lambda_t^*$ , is expected to be proportional to the average probability of a medium-term newcomer outflowing before the end of the interval,  $\theta_t^* = (I_{t \rightarrow t+1}^M - M_{t+1}) / I_{t \rightarrow t+1}^M$ . To correct for an expected bias in levels we, in line with the reasoning given above for the short-term

unemployed, weight  $\theta^*_t$  by the ratio of those remaining from the medium-term newcomers of the previous period,  $M_t / I^M_{t-1 \rightarrow t}$ . Thus we estimate the percentage of  $M_t$  expected to outflow from the medium-term unemployment pool over the six month interval  $t \rightarrow t+1$  as the following:

$$(10) \quad \lambda^*_t \approx \theta^*_t (1 - \theta^*_{t-1})$$

Since the long-term unemployment pool does not empty out over six month intervals by definition, we are not able to distinguish between long-term unemployment newcomer and incumbent outflow. Rather then, we construct long-term outflow with the standard flow-stock relationship equation (2):<sup>5</sup>

$$(11) \quad O^L_{t \rightarrow t+1} = I^L_{t \rightarrow t+1} - \Delta LTU$$

where  $\Delta LTU = L_{t+1} - L_t$  is defined as the change in the long-term unemployment stock over the six month interval and the inflow of newcomers to long-term unemployment is estimated as:

$$(12) \quad I^L_{t \rightarrow t+1} \approx (1 - \lambda^*_t) M_t$$

Given the semi-annual inflows in to unemployment and the semi-annual duration stocks, which can be defined by specific characteristics, one can use equations (6) through (12) to construct a duration analysis of outflows from the Live Register.

The methodology described above allows us to derive the male unemployment outflows from the Live Register conditional upon being of a particular duration, age and unemployment scheme over time. It also allows us to compare the characteristics of males in the stocks with those in the flows and trace the dynamics behind the trends in the overall stock

of unemployment and the stock of LTU. The only exception is posed by the decomposition by unemployment scheme, which can only be undertaken for duration spells under a year. This arises from the fact that when individuals flow in to LTU on an Unemployment Benefit (UB) scheme there is the possibility that they may switch over to receiving Unemployment Assistance (UA) during their spell in LTU when the duration of their benefits is completed.<sup>6</sup>

To provide a comparison between duration specific stocks and outflows we first plot the duration analysis of the stock of the unemployed in Fig. 4. In the late 1960s and early 1970s about 60 per cent of the total stock were short-term unemployed males. This suggests the dominance of multiple short spells in the total unemployment pool in this period. This assertion is verified by Fig. 5 which shows that over 60 per cent of the total outflows were from the short-term pool and over 80 per cent of the total outflows were from duration categories under a year, as derived using our methodology described above. In the latter half of the 1970s one witnesses a growing share of long term unemployed males and a declining share of short-term unemployed males in the total stock. In contrast, still over 80 per cent of total outflows for males were from durations under a year. By the 1990s the share of total long-term unemployment in the stock reached over 50 per cent. However, over the entire period close to 80 per cent of those exiting did so from duration categories under a year. Thus the gap between the duration of a completed spell and that of an incomplete spell has persistently widened since the late 1970s.

5 Alternatively we could have constructed long-term outflow by solving for:

$$O^{\text{Total}}_{t \rightarrow t+1} = O^L_{t \rightarrow t+1} + O^M_{t \rightarrow t+1} + O^S_{t \rightarrow t+1}$$

$$O^{\text{Total}}_{t \rightarrow t+1} = I_{t \rightarrow t+1} - \Delta TU$$

where  $\Delta TU = TU_{t+1} - TU_t$

6 Up until April 1975 the duration of receipt of unemployment benefit was 12 months and 15 months thereafter for most groups of recipients. A switch-over is only possible if the individual satisfies a means test.

Our methodology also allows us to calculate the percentage of the initial inflow in to the Live Register that flows in to the LTU pool a year after entry. We depict this series in Figure 6. In the late 1960s any male had, on average, a 90 per cent probability of exiting unemployment within a year. This probability gradual fell to below 70 per cent by the mid 1980s. From that point it gradually rose to 80 per cent and has remained relatively stable since 1988. Thus, even though there has been a substantial increase in the stock of LTU since 1980, the flows in to LTU were only a small fraction of the initial inflow over the entire period. However, the increasing level of inflows in to the Live Register ensured that a substantial number of individuals became long term unemployed. Fig. 6 suggests that the hazard rates for duration categories under a year did not remain constant over our sample period. Thus, in contrast to the results of Breen and Honohan (1991), we find that the trends in LTU have not been solely determined by trends in the newcomers to the Live Register.

The inflow, outflow and stock of the long-term unemployment pool, as calculated using equation (11), are shown in Fig. 7. From Fig. 1 and Fig. 6 we know that the increasing magnitude of newcomers to the Live Register and the proportions of these flowing into LTU generated increasing flows in to LTU up to 1988. The general excess of long-term inflow over outflow, particularly in the period 1980-88, led to the build-up in the stock of LTU, as is apparent from Fig. 7. Since 1988 one witnesses declining proportions of newcomers flowing into LTU which resulted in a decline in the stock of LTU in the late 1980s, however an increase in the magnitude of newcomers to the Live Register caused LTU to grow again thereafter.

In Fig. 8 we plot the number of LTU pool transitions as a ratio of the number of transitions in the unemployment pool under a year.

Comparison reveals a lack of activity within the long-term pool relative to the activity in the under a year unemployment pool. Relative activity increased in the LTU pool between 1980 to 1988. This was mainly driven by large inflows into the LTU pool. Since 1988 we discover that the relative activity in the LTU pool has declined.

Our analysis thus far indicates that there may be a dual structure in the unemployment pool in that there exists a very dynamic under a year and a sluggish LTU pool. Of the large amount of newcomers entering unemployment over six month intervals only a small fraction experience LTU. One explanation for such a dual structure is heterogeneity among the unemployed, i.e. the cohorts of individuals that flow into LTU have different characteristics than those in the under a year turnover. We now turn to examine the flows and stocks by age and unemployment scheme to find evidence for this hypothesis.

In Fig. 9 we graph our decomposition of the overall inflow by unemployment scheme up to 1979 and age and unemployment scheme thereafter. From the late 1960s the share of males entering on UA gradually rises from about 20 to over 40 per cent by 1988 and increases rapidly to over 60 per cent by the mid-1990s. Given that the qualifying conditions for UB were that no less than 26 employment contributions had to be paid from the beginning of the benefit year in which the claim for UB is made<sup>7</sup>, one can assume that those flowing in to unemployment on the UB scheme are generally coming from the employment state. The trend witnessed in Figure 9 thus implies that flows from the state of employment gradually lost their dominance in the total unemployment inflow over time.

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<sup>7</sup> Employment contributions required to receive UB were increased to 39 in May 1987.

The percentages of the initial inflow of males on UA and UB that flow in to LTU a year after entry are depicted in Figure 10. The survival rate of males on UB rose from 7 per cent in 1968 to 13 per cent in 1975 and fell to 10 per cent in 1979. The survival rates for males on UA in this period were higher but followed similar trends, starting at 15 per cent in 1968, increasing to 30 per cent by 1975 and declining to 20 per cent by 1979. The greater share of males on UB in the inflow of newcomers ensured their dominance in the inflow into LTU despite lower survival rates. In the period since 1980 the survival rate for males on UB increased again from 12 to 27 per cent by 1985, subsequently decreased to 15 per cent in 1988 and has remained stable since. The rate for males on UA moved from 20 per cent in 1980 to over 30 per cent in 1985, decreased to just below 25 per cent by 1988 and has remained relatively stable since. Due to the dominance of males on UB in the flows of newcomers up to 1988 the majority of flows into LTU were, as argued above, males that came from the state of employment a year earlier. Since 1988 males on UA, i.e. flows most likely from non-activity, began to dominate the inflow into LTU due to both their dominance in the flows of newcomers to unemployment and their relatively higher survival rates.

Using the Live Register stock data set O'Connell and Sexton (1994) have noted that LTU is much more prevalent among the older age classes. Age therefore may be another important determinant of the unemployment dynamics. From Fig. 9 we know that between 1980 and 1988 younger and older males on UB dominated the inflows. It is also evident that older males had a greater share of the inflow than younger males. From 1988 onwards the share of males on UB for both age groups gradually declined. In Figs. 11 and 12 we graph the percentage of the initial inflow of males under and over 25 on UA and UB, respectively, that flow in to LTU a year

after entry. Accordingly, the survival rates for older males have been more volatile than those of younger males. In the early 1980s 20 per cent of the older men on UB remained unemployed after a year. This increased to above 30 per cent by the mid 1980s and gradually declined to around 15 per cent by 1988, remaining relatively stable thereafter. The trends in the survival rates for older men on UA were similar even though the survival rates were generally 10 per cent higher. In contrast, the survival rates for younger males were much lower than older males up to 1988. Since 1988 the survival rates for younger and older on both UB and UA have nearly converged.

Considering Figs. 9, 11 and 12 together allows one to draw a more general picture. Between 1980 and 1988 entries on UB were dominant in the unemployment inflow. In particular, multiplying the number of older newcomers times their long term survival rate we find that older males, particularly on those UB, were responsible for the rising inflows into LTU. Between 1988 and 1995 the survival rates for all male groups fell and the numbers of older entries on UB have declined substantially. Even though the inflows into LTU have not superseded their 1988 level, LTU still increased in the 1990s due to low levels of outflows from this pool.

Due to data constraints we are unable to decompose the outflow from LTU into its different age and unemployment scheme components. However, as pointed out earlier, O'Connell and Sexton (1994) found, using stock data, that long term unemployment is distinctly more prevalent among older age groups. The Department of Enterprise and Employment (1996), in comparing the employed, unemployed for less than a year and the long term unemployed found that the long term unemployed have very low relative levels of educational qualifications. Specifically, a large proportion of the long term unemployed have no educational qualifications

and most do not have the Leaving Certificate. In contrast, the skill levels of those unemployed for less than a year are not drastically different from the employed. Similar results were already found for the unemployed in 1991 by Sexton and O'Connell (1993). Moreover, Snessens (1995), in linking skill mismatch to unemployment persistence in 14 OECD countries, shows that Ireland has the highest indicator of skill mismatch as measured by the gap between the unemployment rate of skilled and unskilled workers defined on the basis of the educational level and proportion of long term unemployed. All of these factors tend to hint to theories of heterogeneity as a plausible, at least partial, explanation for the build up in long term unemployment. Moreover, our analysis above indicates considerable heterogeneity within the newcomers to the Live Register. Only small fractions of each cohort of newcomers flow in to LTU. The magnitude of these flows, their compositions by age and unemployment scheme and the corresponding long term survival rates changed over time and are significantly different in the period 1980 to 1988 compared to the period 1988 to 1995. The dominant group in the inflow into LTU in the period 1980-1988 were older males coming from the state of employment a year earlier. In this period there was a substantial build up in the LTU stock, increasing from 30,000 to 90,000. In contrast, in the 1970s, flows from employment were similarly the dominant force in the unemployment inflow, yet a similar accumulation in the long term pool did not occur. Since 1988 entries of older males flowing from the state of non-activity have been the driving force of the inflow in to LTU. The LTU stock consequently decreased to 70,000 by 1991 and then increased again to just reach just under 100,000 long term unemployed males. However, clearly the key period for the build up of the long term stock was the period 1980 -1988.

### Section III: Structural Changes in Employment

We noted in the introduction that there are number of theories, such as that of unemployment culture and state dependence, that could explain the strong incidence of long term unemployment and its build up over the 1980s in Ireland. Our results from the previous section suggest that heterogeneity in the unemployment inflow may be the key to explaining the presence of LTU. If true, the question that remains to be answered is what caused these older, relatively unskilled males to flow in to unemployment from employment in the period 1980-1988 and remain in the unemployment pool for long durations.

The strong incidence of long term unemployment is a feature found in most countries in Europe but not in the US. The OECD (1996) highlight the fact that, compared to the US, a substantial amount of employment adjustment in Europe seems to take place within or between firms resulting in vacancies being filled by workers from inside the firm or from other firms. The workers who do become unemployed in Europe then seem, unlike those in the US, to have difficulty leaving unemployment and can experience long durations in the unemployment state. Thus, as suggested by the OECD (1996), it may be the nature rather than the lack of employment adjustment in the European labour market that causes LTU. As a matter of fact, structural changes in labour demand have been put forth as the prevalent cause for the European unemployment problem (Heylen et al., 1996). Basically, it is argued that there has been a fundamental shift in the occupational structure of labour demand from unskilled towards skilled labour, primarily taking place over the 1980s. As pointed out by Heylen et al (1996), there a number of, not necessarily mutually exclusive, reasons for this development. Specifically, movements

in production from blue to white collar industries, the introduction of new, more capital intensive, technology, the expansion of trade with developing countries with a comparative advantage in the production of goods that utilise more unskilled labour, and the net outflow of foreign direct invest can explain this shift in labour demand.

In the Irish case, the fact that the older, relatively uneducated individuals that accumulated in the long term unemployment pool over the 1980s mostly came from the state of employment makes the story of structural employment changes as a cause for the Irish unemployment problem quite plausible. Using Labour Force Survey data Corcoran et al. (1992) study the occupational trends for the period 1971 to 1991 and we reproduce these for the periods 1971 to 1979, 1981 to 1986 and 1986 to 1990 in Table 1. From these one can see that there were large occupational shifts in employment. Moreover, it becomes apparent from this breakdown that most of the change in the occupational structure took place over the 1980s. Whereas in the 1970s only agricultural workers and labourers experienced a decline in employment, over the 1980s occupations such as clerical workers, skilled maintenance, semi-skilled worker, operatives, foremen and security workers, were subject to employment contractions.

The occupational changes may have caused employment adjustments both across and within sectors. As pointed out by O'Connell and Sexton (1994), there have been substantial changes in the sectoral composition of employment in Ireland. Specifically, a decline of agriculture and traditional manufacturing was coupled with a rise in services and modern manufacturing employment. There are also likely to have been changes in the occupational structure of labour demand within sectors. For instance, the changing skill structure of employment has been

documented for the US manufacturing sector by Berman, Machin and Bound (1995), for France and Germany by Sneessens (1995) and for the UK by Machin, Ryan and Van Reenan (1996) and Nickell (1996). All these studies indicate that the decline of unskilled employment is mainly explained by restructuring within and not between sectors. While, Corcoran et al. (1992) argue that industrial composition alterations are likely to be the driving factor of the changing occupational structure in Ireland, more recent evidence indicates that, similar to the countries studied above, movements in the share of occupations within at least the manufacturing sector is of greater importance. For instance, Kearney (1996) finds that in almost 80 per cent of 72 sub-sectors of Irish manufacturing the ratio of skilled to unskilled employment levels rose for the period 1979 to 1991. Using a shift-share analysis Barry and Hannan (1996) confirm the importance of within sector skill structure changes by showing that for the same period these caused over 70 per cent of the increase in the proportion of skilled workers. While the lack of data availability does not allow us to discriminate between the importance of between and within sector occupational changes for unemployment, the CSO Industrial Analysis of the Live Register does classify the stock of insured individuals by their previous sector employment. We depict the growth of unemployment for several broad sectors in Table 2. It is apparent from these calculations that practically all sectors experienced growth in unemployment over the 1980s. This suggests that there are likely to have been factors affecting all sectors, such as within sector occupational structure changes, that at least had a partially significant role in the increase in unemployment over the 1980s.

Thus far we have discussed and provided evidence on how certain structural changes in employment coincided with the build up of long term

unemployment in the 1980s. However, it still needs to be explained why unemployment caused by such employment adjustments would persist as it does in Ireland. In a standard neo-classical framework price and quantity adjustments would tend reallocate those who lost their jobs to new employment over time. It has been argued that the fact that unemployment persists in Europe, but not in the US, is due to labour market rigidities. In particular, European countries tend to be characterised by more extensive employment protection legislation, greater union power, higher minimum wages, and greater unemployment compensation generosity (Heylen et al., 1996). This, of course, may also have been the case in Ireland, however, we argue for another explanation. Until Ireland's entry to the EC most sectors of the economy were traditionally protected from external competition and it is likely that prior to this the human capital of workers in many occupations was not up-dated and the introduction of new technology was resisted by workers due to a fear of layoffs and different conditions of employment. When the institutional environment changed and all sectors of the economy became increasingly exposed to the globalisation of trade and new technology inefficient human capital had to be shed. The deep recession in the early 1980s presented sectors with the ideal opportunity to undertake such changes. The market, from the demand or supply side, probably had little incentive to re-build the human capital of older and unskilled workers. Could a relative wage adjustment not have moved this human capital to employment? New levels of skills were required in all sectors of the economy. The sunk costs associated with the training or re-building older human capital and the limited duration of return of such an investment may have led firms to exclude these individuals from the effective labour force even if, as a consequence, they incurred higher wage costs. Moreover, competition from younger and

skilled new entrants for the jobs available would have re-inforced the lack of incentives to re-build older human capital.

### Conclusion

In this paper we have decomposed the semi-annual male unemployment inflow in to its components of age and unemployment compensation scheme and the semi-annual male unemployment outflow by length of duration spell, age and unemployment compensation scheme. These disaggregations allowed us to investigate the evolutionary path and characteristics of males that became long term unemployed. Our results show that that the build up in the long term unemployment stock in the 1980s was primarily driven by flows of older, unskilled males entering unemployment from employment one year earlier. We make the argument that it was structural changes in employment, due to changing occupational structures between and within industries, that caused extensive shedding of inefficient human capital over the 1980s that was at the root of this phenomena. Moreover, it is likely that the degree of protection of industries and the resistance of workers to new technology prior to the 1980s in Ireland has amplified the degree of skill mismatch and incidence of long term unemployment relative to other European countries

In the face of skill mismatch a natural response for government, as a social planner, is to attempt to retrain the long term unemployed in order to reintegrate them in to the effective labour force. This stance seems to have driven much of the Irish policies, such as a number of training and employment schemes, as a remedy for the long term unemployment problem. If however, as argued above, the human capital deficiencies of those shed in the 1980s are extensive, then one must ask whether, from an

economic efficiency point of view, the costs of re-integration may not outweigh the benefits.

As for the future, the introduction of competition in to the protected public utilities and private services in the non-traded sector of the economy over the next few years could again create restructuring of employment that will lead to substantial flows of older males with redundant human capital in to the unemployment pool. Thus, another phase of LTU may lie ahead.

**Table 1: Annual Average Changes in Occupational Employment**

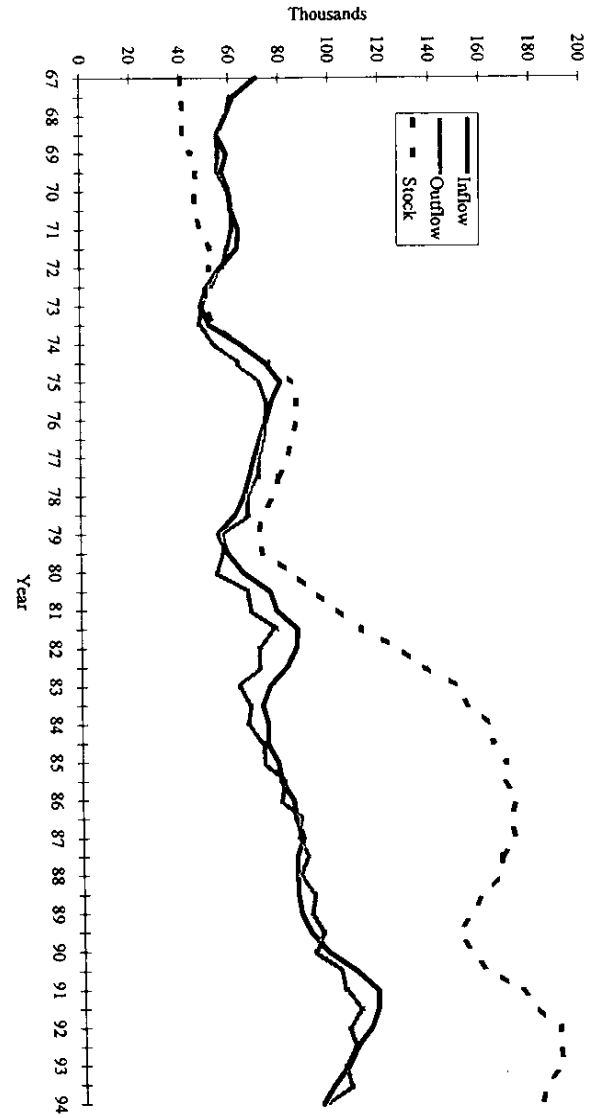
<i>Occupation</i>	<i>1971-81</i>	<i>1981-86</i>	<i>1986-90</i>
Agricultural Workers	-3.6	-2.4	-0.1
Managers / Proprietors	3.5	0.3	2.9
Professionals	3.6	1.9	3.7
Associate Professionals	5.0	1.2	2.6
Clerical Workers	3.0	-0.4	-0.5
Skilled Maintenance	4.0	-0.2	-0.8
Other Skilled Workers	0.3	-3.8	3.1
Semi-Skilled and Operatives	1.5	-2.9	1.0
Foremen	2.1	-3.5	-4.9
Transport Workers	0.3	-2.1	1.1
Sales Workers	1.2	1.5	0.0
Security Workers	4.6	2.3	-2.9
Personal Service Workers	0.8	1.7	1.4
Labourers and Others	-1.9	-4.6	-3.8
<i>Total Employment</i>	<i>0.8</i>	<i>-0.8</i>	<i>0.3</i>

*Source: Corcoran et al. (1992)*



**Table 2: Sectoral Unemployment Growth Rates 1979-88**

Sector	1979-88
Traditional Manufacturing	140.5
High Tech Manufacturing	130.9
Building & Construction	111.8
Gas, Electricity & Water	259.1
Transport & Communications	18.4
Distributive Trades	198.7
Finance	262.5
Public Administration	354.7
Professions	242.9
Personal Services	237.2
Entertainment & Sports	128.3
Other Industries & Services	117.1
Agriculture	-30.0
Fishing	164.3



**Figure 1: Irish Semi-Annual Male Unemployment Inflow, Outflow & Stock (3 pt. mov. avg.)**

Figure 3: Upper and Lower Bound of Male Unemployment Transitions

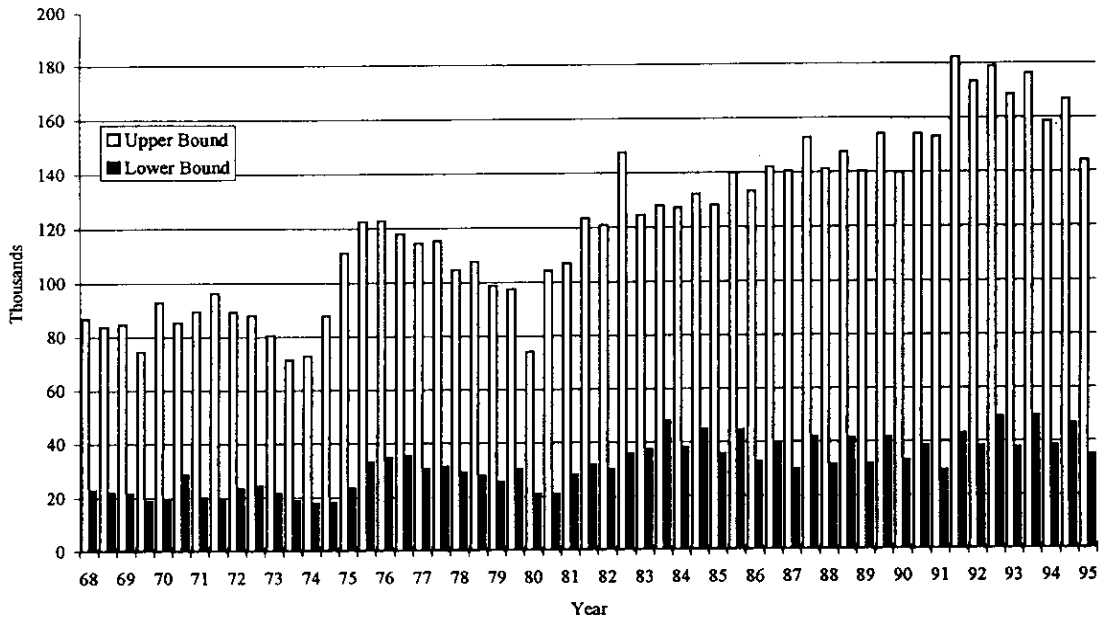


Figure 2: [Net Change in Male Unemployment Stock] vs. Male Unemployment Turnover

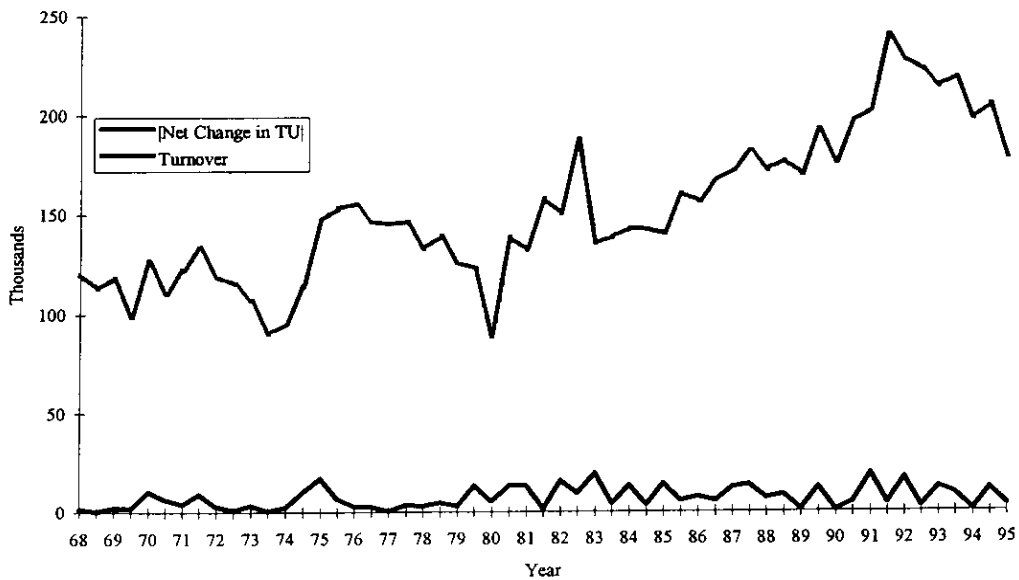


Figure 5: Male Unemployment Outflow Decomposition

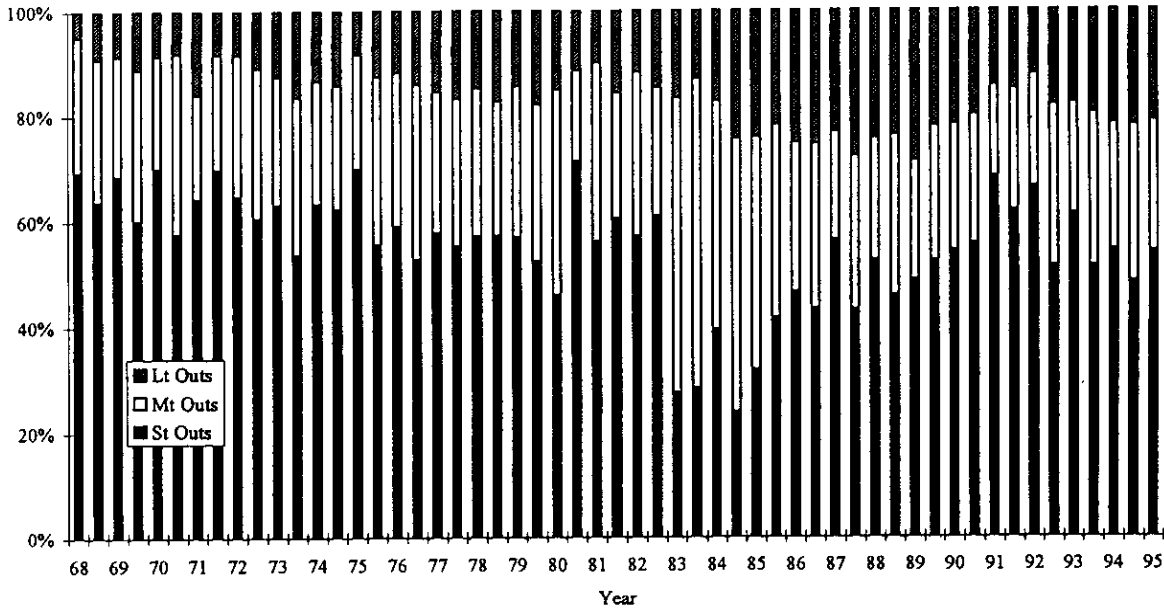


Figure 4: Male Unemployment Stock Decomposition

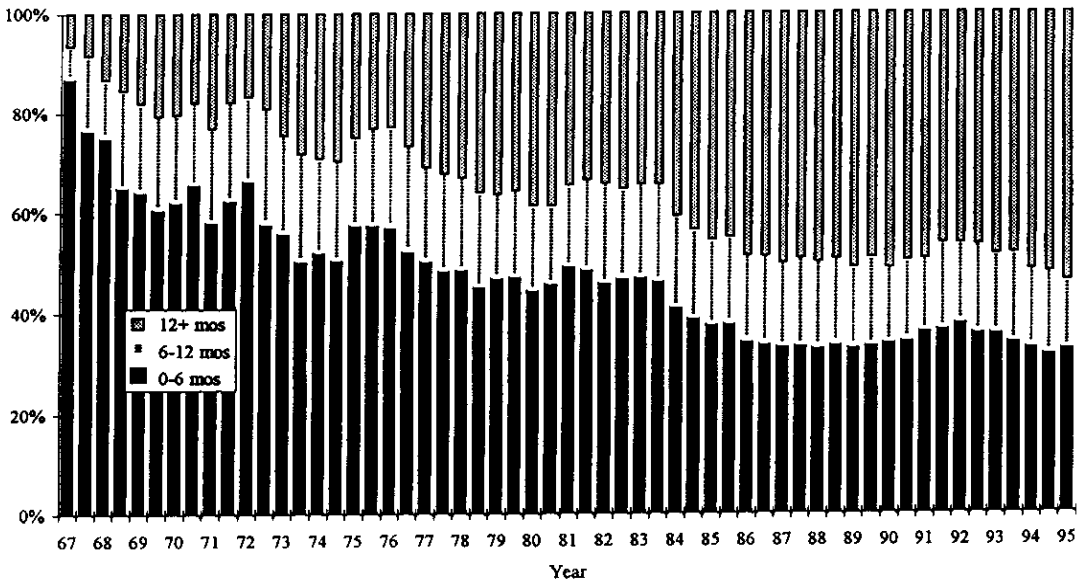


Figure 7: Male Long-Term Unemployment Stock, Inflow & Outflow

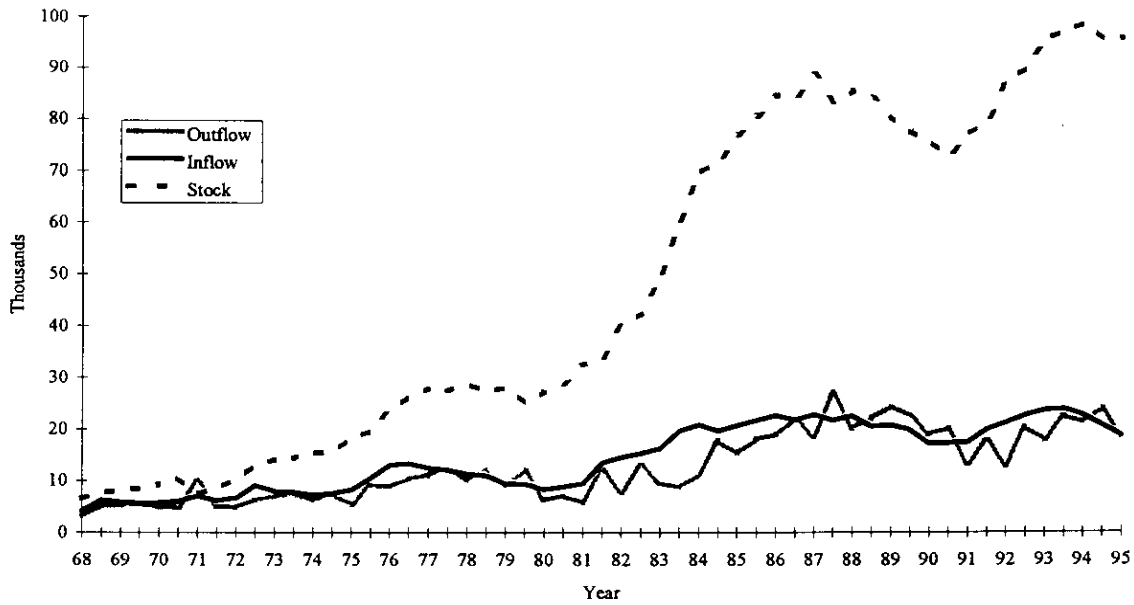


Figure 6: Percentage of Male Unemployment Inflow Flowing in to Long-Term Unemployment

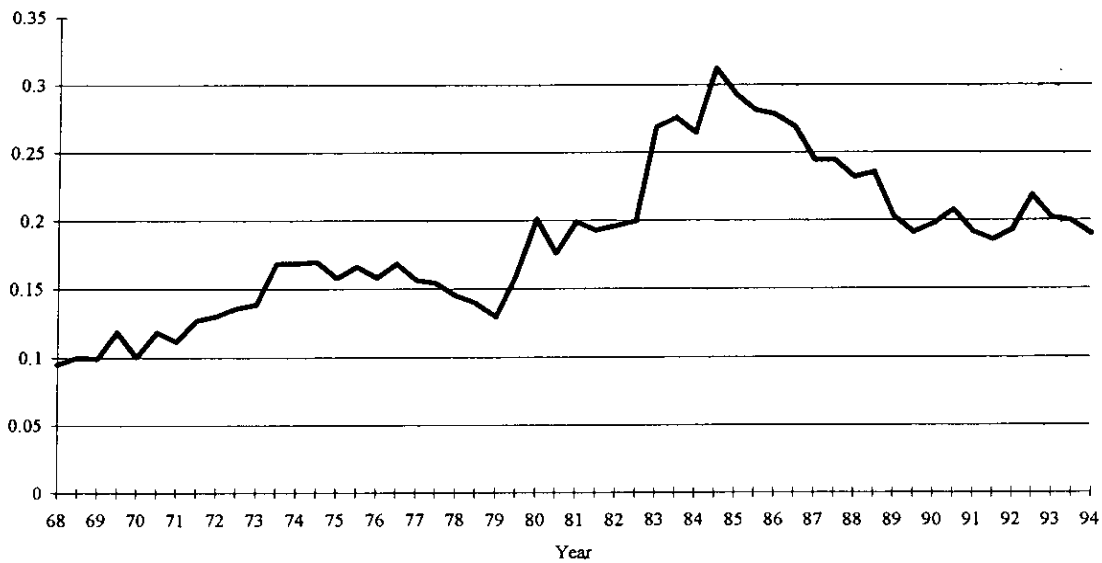


Figure 9 - Irish Male Inflow Decomposition

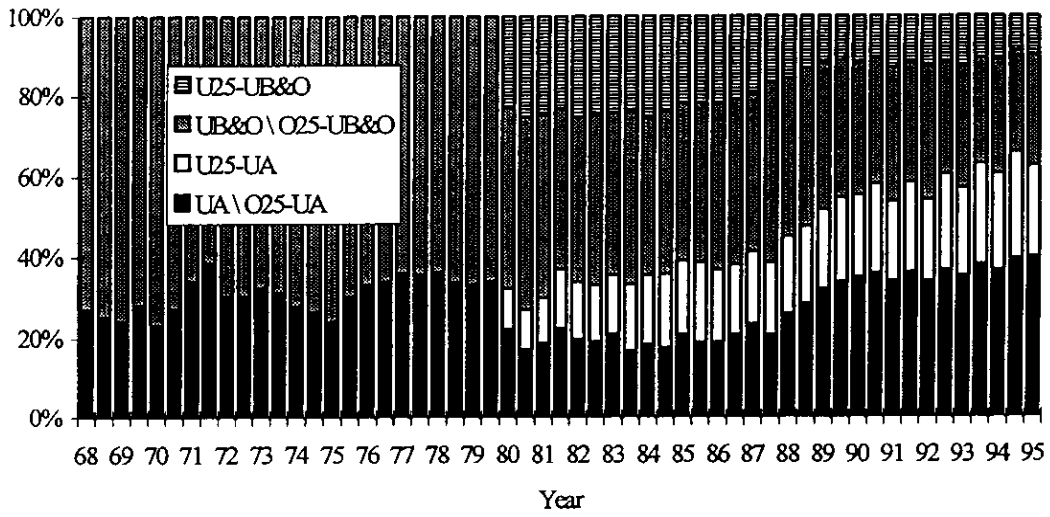


Figure 8: Ratio of Male Long-Term to Under a Year Unemployment Turnover

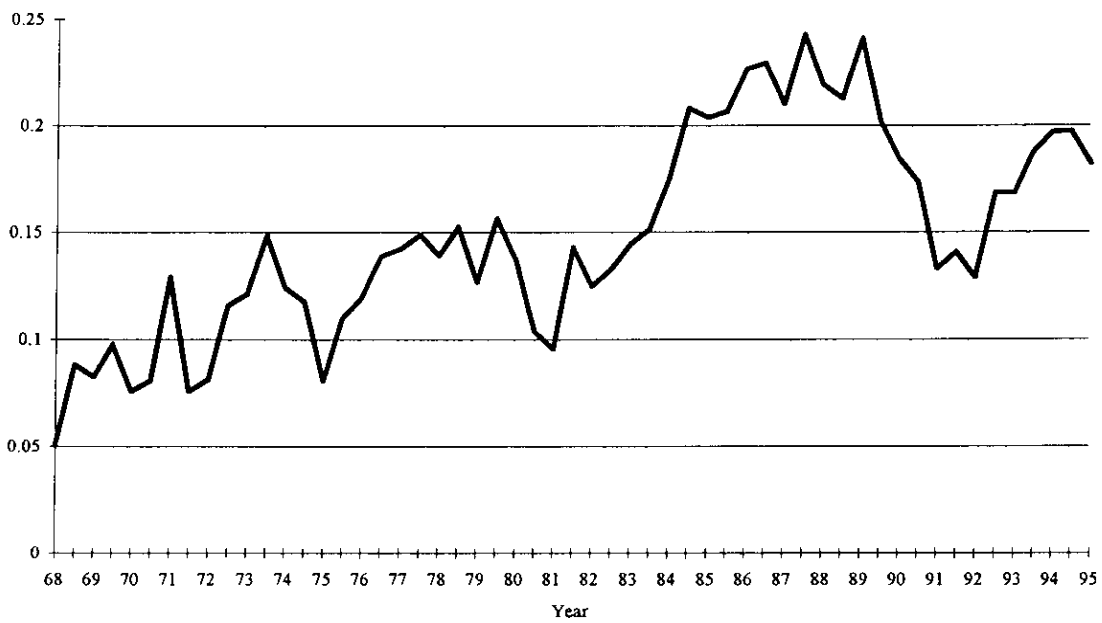


Figure 11: Percentage of UB Inflow Flowing in to Long-Term Unemployment

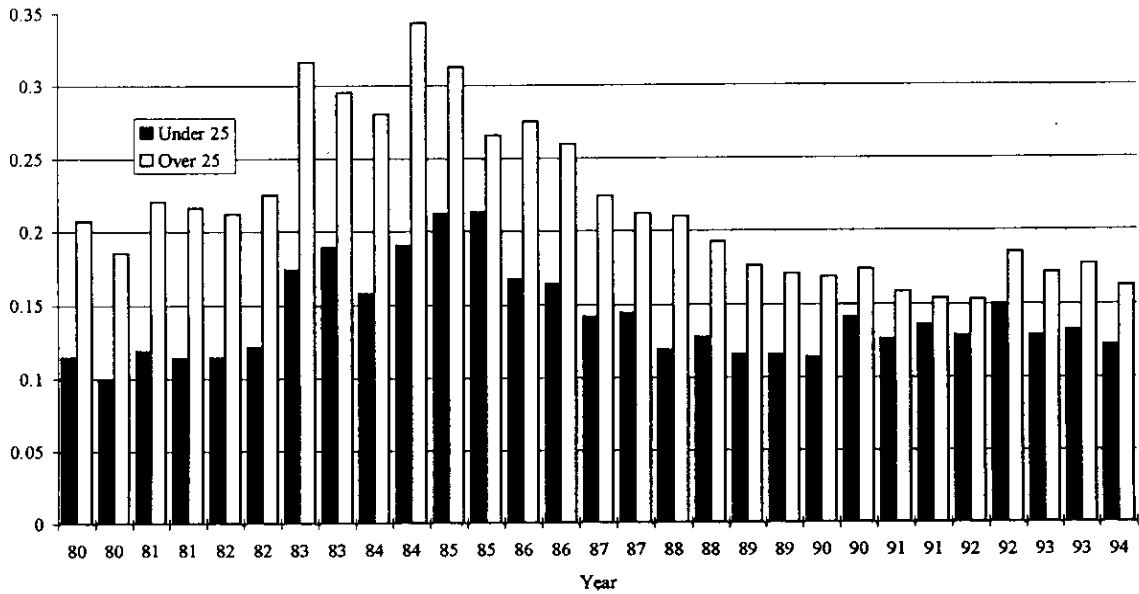
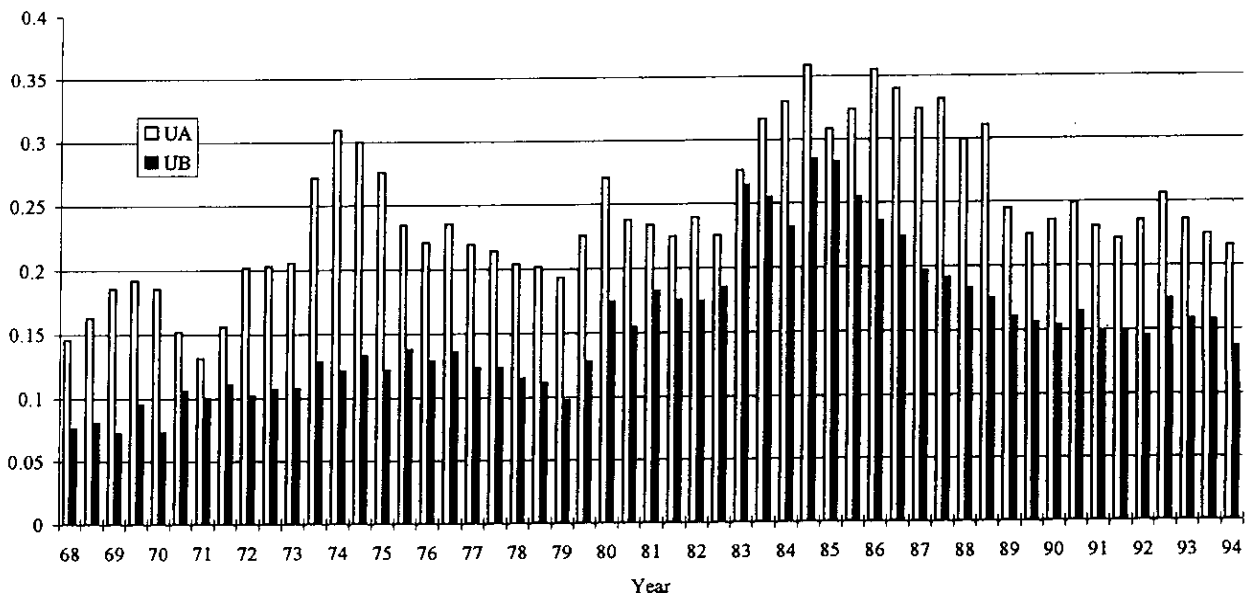


Figure 10: Percentage of Unemployment Inflow Flowing in to Long-Term Unemployment



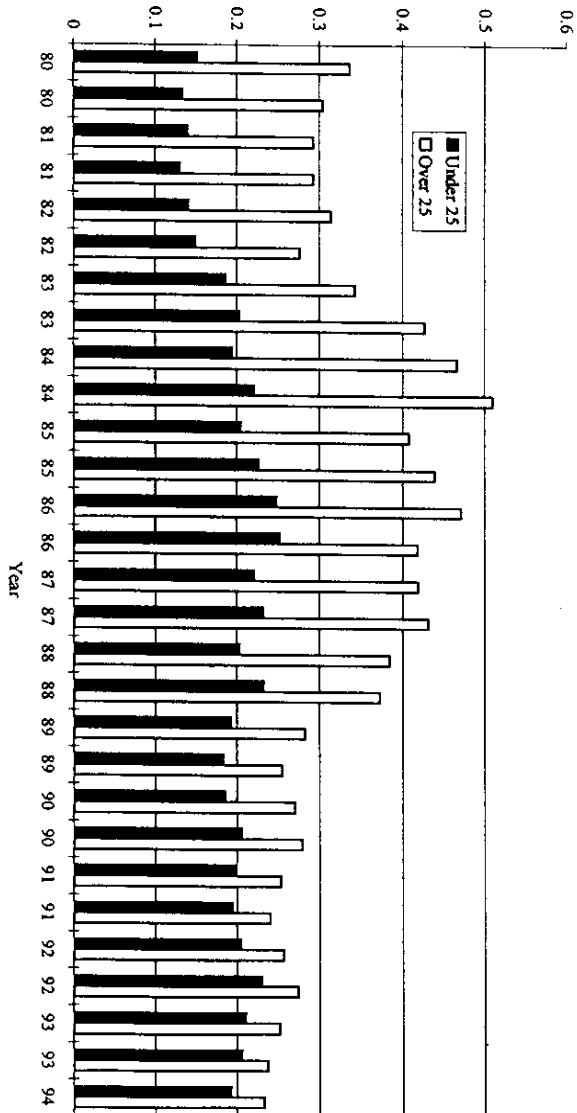


Figure 12: Percentage of Male U.A Inflow Flowing in to Long-Term Unemployment

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