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The Impact of Discriminatory Legislation on Irish Female Unemployment Flows

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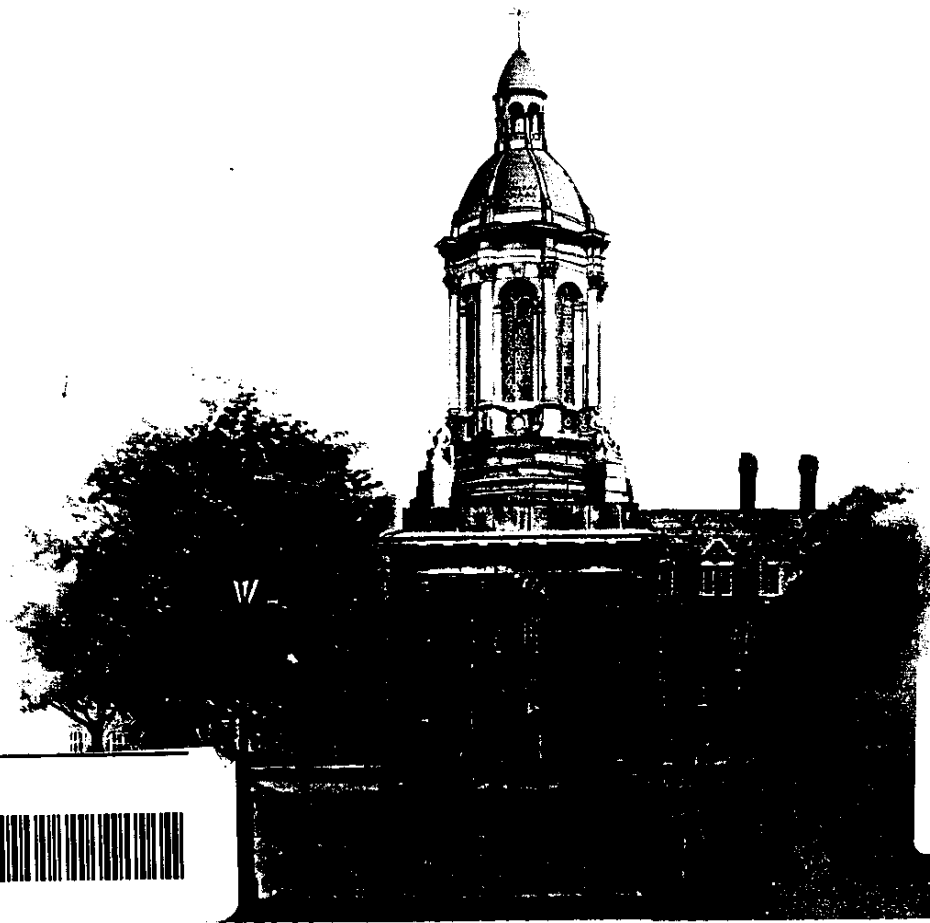
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**THE IMPACT OF DISCRIMINATORY LEGISLATION ON IRISH
FEMALE UNEMPLOYMENT FLOWS**

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Abstract

Ireland provides us with a unique case study of the effects of discrimination in the labour market. Since the late 1960s and until the late 1980s, gradual reforms of explicit discrimination against females with regard to entitlement to and duration of unemployment assistance and benefit have been introduced. The primary aim of this paper is to assess the impact that these reforms have had on the level of female turnover activity in the Live Register. The results show that the reforms may be modelled as well defined discrete shifts in the inflows, and it is noteworthy that the more significant of the estimated effects of reforms are those corresponding to those which gave the large numbers of females that were in non-activity the option of entering the Live Register without any prior need of employment contributions. The results also provide evidence of a secondary effect of reforms on the level of female outflows, and appear to support the hypothesis that the reforms have encouraged females to remain in the Live Register for longer durations.

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I Introduction

Estimation of the impact of anti-discriminatory legislation changes on the labour market has primarily focused on the effect that such changes have had on subsequent relative pay and employment structures. Tzannatos and Zabalza (1985, 1988) estimate the effect of introducing anti-discriminatory legislation on relative pay and employment of British women compared to men. British women were estimated to have experienced a marked increase in relative pay, and employment variability for women had fallen. This finding contradicted the results of Pike (1985) who attributes no significant role to the same legislation. One major drawback of attempting to assess the impact of such a legislative change is that discrimination in relative pay and employment is very difficult to measure *ex-ante*. There are many human capital and non-competitive explanations as to why we can observe differences in both relative wage and employment structures. It is impossible to control for every human capital and industry-specific factor that affects relative wages and employment levels and hence allow one to interpret the residual component as a measure of discrimination. Given that there is no direct way of measuring the component of relative pay and employment structure that is due to discrimination *ex-ante*, it becomes a difficult exercise to assess the impact and success of an anti-discriminatory legislation change *ex-post*.

Ireland, however, provides us with a unique case study of discrimination that was characterized by explicit discrimination against females with regard to entitlement to unemployment assistance and benefit. The elimination of this discrimination was a gradual process that commenced in the early 1970s and continued well into the 1980s. Thus it is the legislation itself, an exogenous variable, that in the Irish case defines discrimination. Therefore, in terms of assessing the effect of anti-discriminatory legislation, the difference between the

ex-ante and ex-post situation is well defined.

We know of only one paper to date that attempts to assess the impact of anti-discriminatory legislation on female unemployment. Van Rompuy (1984) measured the impact of anti-discriminatory unemployment legislation that extended Dutch government employment programmes and found that it significantly increased unemployed females' willingness to work. The lack of studies specifically focusing on the effect of anti-discriminatory legislation on unemployment in other countries arises partly due to the fact that those countries lack the characteristics of the unique Irish situation.

The importance of the gradual relaxation of this legislation in Ireland had already been hinted at by Walsh (1993), who upon discovering a highly positive relationship between the rate of unemployment benefit and the female labour force participation rate, concluded that improvements in women's entitlement to social welfare payments may have increased the supply of women. However, no attempt has been made to model the impact of the different legislation changes that concern females' benefit and assistance entitlements, pay rates and duration on the evolution of their unemployment. This is the primary aim of this paper.

In modelling the impact of the changing anti-discriminatory legislation on female unemployment behaviour, we also control for the fact that employment and demographic (migration) movements respond largely to economic activity in Great Britain. Ireland, in economic terms, has always been a small open region within the British Isles. Normally the modelling of female behaviour in the labour market can be complex compared to that of males as the flows between non-activity and the labour force can be part of a household decision. Yet we will show that two special features in the Irish case, namely, migration flows and the gradual relaxation of discriminatory legislation on assistance and

benefit provide considerable explanatory power.

The remainder of the paper is organized as follows. In Section II we describe the discriminatory institutional setting for females in terms of employment and unemployment. In Section III we briefly review the labour force developments for females in order to indicate the potential importance of demographic factors and legislative changes. In Section IV we analyse the quarterly flows and stocks of males and females in the Irish Live Register and propose an empirical agenda for modelling the female unemployment flows. In Section V we estimate the impact that the different anti-discriminatory legislative changes have had on the female unemployment flows. Finally, we state our conclusions in Section VI.

II Institutional Setting¹

Until comparatively recently, the labour market for females in Ireland operated within an institutional context which, by European standards, was characterized by a considerable degree of discrimination compared to that of the market for males. The prime reason for this was probably rooted in the traditionally perceived role of the male as the 'breadwinner' and the female as the financially dependent housewife. Females in other European states were of course subject to similar discrimination, but Ireland was generally much slower in eliminating inequalities and adapting to EU norms concerning employment and unemployment legislation and practices. This slowness may be explained in part by the fact that the wording and interpretation of the Irish Constitution

¹ Unless stated otherwise, the material in this section is based on information contained in the First Commission on the Status of Women (1972) and the Second Commission on the Status of Women (1992).

(1937) has not been an adequate tool for protection against discrimination based on gender or marital status. For instance, the discriminatory undertones in Article 41.2 of the Constitution, which states that "*By her life within the home, woman gives to the State a support without which the common good cannot be achieved. The State shall, therefore, endeavour to ensure that mothers shall not be obliged by economic necessity to engage in labour to the neglect of their duties in the home*", reinforced the perception of the Irish woman's responsibilities as being within the home. Similarly, Article 45.2, which was written to protect equality between the sexes, has in the past been interpreted by the courts to exclude protection in matters of employment. As discussed in Connelly 1993, it was Ireland's accession to the European Community and its subsequent obligation under Article 119 of the Treaty of Rome to establish gender equality that induced the Irish government to ratify anti-discriminatory, and discard discriminatory, legislation during the 1970s and 1980s. In particular, the 1972 amendment to the Constitution (Article 29.4.3) gave effect to Community law and imposed on the Irish government the duty of changing legislation in accordance with EU directives. In the remainder of this section we describe the changes with regard to discrimination in employment and unemployment in the Irish female labour market that have taken place since the late 1960s.

Discrimination in employment can be roughly categorized as relating either to pay or to access. Lower pay may discourage women from joining the labour force and, as of the early 1970s, discrimination on pay was a common practice in Ireland. In the public service sector there were lower pay rates for women in general and married women in particular for most professional, technical and some other departmental grades. The differential pay rates in the public service sector based on gender were removed during the period 1973 to

1974 and those based on marital status in 1974. For all other sectors it was the ratification of the 1974 Anti-Discrimination (Pay) Act, effective as of January 1976, that guaranteed women equal pay in situations in which an existing male was performing comparable work². Also, discriminatory taxation policies lowered women's after tax pay rates. Until the Finance Act of 1980, the income of a married woman was deemed to be that of her husband and thus he was responsible for paying her income tax. This meant that her income was taxed at his tax rate, which almost certainly was higher than hers alone would have been. As of today, some tax concessions are still discriminatory.³

Discrimination which restricts access to employment limits female employment opportunities relative to those of males, and consequently their access to unemployment benefits. One of the most blatant practices of restriction in access to employment in Ireland was the marriage bar. Under this restriction married women could not gain employment in the civil service⁴, service industries, banks, local authorities, semi-state bodies and some private firms, and, if women married while in employment, were forced to resign upon marriage. This practice was abolished in the civil service through the 1973 Civil Service Act; however, it remained legal in all other sectors until the ratification of the 1977 Employment Equality Act, which prohibits discrimination in matters of both gender and marital status. Even in those sectors that did not use the

² This of course brought problems with it in that it prescribed the existence of a male doing comparable work. Additionally, this Act did not abolish differential rates based on marital status; full equality in pay was only established with the passing of the 1977 Employment Equality Act.

³ See Mahon (1994) for further details.

⁴ This was legally established in the civil service for all pensionable posts by The Civil Service Act of 1956.

marriage bar it was often the standard practice that women were required to leave their jobs upon pregnancy. This practice was eliminated under the 1977 Unfair Dismissals Act. Additionally, the 1981 Maternity Protection of Employees Act created the right of women to paid maternity leave. Women were also banned from working at night and Sundays in the industrial sector through Ireland's ratification in 1952 of the International Labour Organization Convention Order No. 89; this practice was discarded through The Employment Equality (Employment of Women) Order on 1987. Finally, as Pyle (1990) points out, the policy of the Industrial Development Authority in the period 1969 to 1975 in extending grants to those industrial projects that, amongst other things, promised to create jobs of which 75 per cent were for males, may have substantially limited female employment in the growing export-oriented manufacturing sector.

In unemployment, the discrimination against females has ranged from more stringent eligibility criteria to basic exclusion from unemployment assistance and benefit. Exclusion from the Live Register also means exclusion from state-sponsored employment and training schemes. Table 1 provides an overview of the general and female-specific qualifying conditions for unemployment assistance and benefit and their evolution over time. This evolution is described in terms of the discrimination experienced by the following three groups: single women and widows, married women, and women employed in agriculture and private domestic service.

Single women and widows, not employed in the agricultural or domestic service sector, were only discriminated against with regard to unemployment assistance. Specifically, it was feared that a large number in this category would not actually be seeking employment yet would become claimants of unemployment assistance, at a high cost to the government. Also, in the case of

widows, qualification criteria were designed to prevent unemployment assistance overlapping with widows' pensions. In order to qualify for unemployment assistance the women in this group, unlike males, were required under the 1933 Unemployment Assistance Act to demonstrate their actual interest in seeking employment by having a minimum of 52 employment contributions at the ordinary rate⁵, or have at least one dependent. Essentially this regulation also excluded from the Live Register all those legitimately seeking employment but not having the requisite work experience to qualify for unemployment compensation. This condition was relaxed in 1977 by the lowering of the number of required contributions to 26, and it was finally abolished in 1978.

Married women were perhaps subject to the most severe exclusion and/or eligibility restriction criteria. The Irish legislative stance towards married women receiving unemployment compensation can be traced back to, and is based on, the Beveridge Report on Social Insurance and Allied Services prepared by Sir William Beveridge for the British Parliament in 1942. The view in the document was that, upon marriage, a woman acquired a new economic and social status different from that of a single woman, and that as a "first line of defense against risks which fall directly on the solitary woman"⁶ she in turn gained a right to maintenance from her husband, which was to be provided either from his pay or his unemployment compensation. Essentially the Report assumed that a woman became dependent on her husband through marriage, and this stance was clearly reflected in the qualification conditions of both unemployment assistance and benefit in Ireland. In order to qualify for unemployment assistance a married woman had to be considered independent of her husband and have at

⁵ As from 1973, the contribution no longer had to be at the ordinary rate.

⁶Beveridge Report (1942), paragraph 108.

least one dependent of her own. Since by the Irish legal definition of a dependent, a married woman would have automatically been deemed to be dependent on her husband unless he was incapable of maintaining himself due to mental or physical incapacity, this implied exclusion, as pointed out by Connelly (1993). This condition was eased in 1982 for those married women without child dependents that were separated from, and not supported by, their husbands. It was only when a gender-neutral definition of a dependent was introduced in 1986 that married women were treated equally to married men in terms of unemployment assistance. The discrimination against married women with regard to the qualifying conditions for unemployment benefit was much more explicit. Following marriage, a woman was discredited of all her employment contributions and had to acquire another 26 to re-qualify. In compensation she received a marriage grant which, as determined by the 1952 Social Welfare Act, was set at a sum between £3 and £10 and had not changed since that time. This special requirement, and consequently the marriage grant, was disposed of in 1973. Moreover, any married woman living with, or wholly or mainly maintained by, her husband⁷ received a lower rate of benefit than a male and the duration of receipt of benefit was limited to 156 days compared to the regular 312 days. In response to a series of EU directives, and following revision of the standard period to 390 days, the duration of receipt of benefit for a married woman was extended to 312 days in 1979, and to the standard duration in 1986. Similarly the lower rate of benefit for a married woman was increased to the standard rate in 1986. However, as argued by Connelly (1993), the main step towards equality in unemployment benefit, as in unemployment

⁷ As with unemployment assistance, a woman was automatically assumed to be maintained by her husband totally or in large measure.

assistance, came with the introduction of a gender-neutral definition of a spouse dependent in the same year.

While unemployment insurance was introduced in a limited form as long ago as 1911 and extended in 1920, it was not until 1966 that the females in agriculture and private domestic service were included in the scheme, and only then at a lower contribution rate than other workers. The reason for the earlier exclusion of females in agriculture was that in that industry the risk of employment loss was small and it would have been a burden to impose the full rate of contribution on the generally low paid female employees. For those females employed in private domestic service it was feared that many may be tempted to leave their employment to take advantage of any unemployment compensation and that, since it is difficult to verify domestic employment, others could claim to have been employed in order to avail of assistance, and hence the incidence of fraud would be large. As can be seen from Table 1, the qualification criteria for females in agriculture and private domestic service were much stricter for both unemployment assistance and benefit than those for males and those for females in other sectors. Of course, females in the agriculture and domestic service sector who were single or widowed could not qualify for unemployment assistance, given that they contributed at the lower rate, for the reasons already mentioned above. Under the unemployment benefit scheme, females in agriculture and domestic service could only qualify if they had acquired 10 years of employment contributions, as compared to the 26 contributions required of males. All special requirements for this group were revoked in 1973.

From the above review of legislative developments it is clear that the guarantee of equal treatment in employment and the abolition of discriminatory criteria for females with regard to unemployment assistance and benefit was the

result of an incremental process that did not commence until the early 1970s and which continued well into the 1980s. Moreover, these developments substantially changed the institutional setting of the female labour market and one would expect that they would also be reflected in changing female labour market behaviour over this period and beyond. Until the mid-1970s, discriminatory practices defined what jobs were available to what females and even what rates of pay were available.⁸

Specifically with regard to unemployment, single women or widows without prior work experience or a dependent were excluded from receiving unemployment compensation until the late 1970s. The relevant legislative changes would have particularly affected female school leavers, graduates and others coming from non-participation who did not manage to flow immediately into employment. Married women only fully gained the right to equal access to unemployment compensation in the mid 1980s. The particularly restrictive practices that affected women in the agricultural and domestic service sector were eliminated in 1973. It becomes clear that the impact of the progressive removal of discrimination, both in terms of employment and unemployment, could have been substantial. In the next section we review some basic female labour force developments and, where appropriate, suggest tentative links to the legislative changes discussed above, which in turn provide the basis for our detailed empirical analysis of female unemployment flows in Section V.

⁸ Since 1975 the ratio of female to male wage rates has risen by about 8 per cent. Controlling for educational qualifications, labour market experience, time spent unemployed and out of the labour market, and self-selection of women into the paid labour market, Callan (1991) estimated that in 1987 female wage rates would have been 15-30 per cent higher if these attributes had been evaluated in a gender neutral manner.

III Female Labour Force Developments

The overview of female labour force developments in Ireland contained in this section is carried out using annual stock data taken from various Censuses of Population and Labour Force Surveys for the period 1971 to 1993. The analysis highlights two special features of the Irish labour market, namely, migration and the relaxation of discriminatory legislation that allowed more open access to employment and unemployment, which could be of central importance to the evolution of female unemployment and hence for our modelling of female unemployment flows. We first look at annual labour force developments to see whether the effect of these factors was in any way apparent in the stock data. Table 2 gives the composition of labour force growth over the period 1971 to 1991. Since the early 1980s, the employment experience of females under 25 years of age has been dramatically different from that of those over 25 years, and for this reason we analyse labour force growth and its composition for these two age categories.

In every decade there has been strong growth in the female labour force. This growth is accounted for mainly by the increase in the number of older females in employment, but to a lesser extent it is due to the increase in the number of both the older and younger females in unemployment. The increased number of older females in employment is likely to have been a consequence of the abolition of discriminatory practices that restricted the access of married females to employment, the emergence of protective legislation to ensure equal opportunity and pay for females, and changes in traditional attitudes towards women working. The increased numbers of younger and older females in unemployment is, we contend, likely to have resulted from the relaxation of eligibility criteria that denied access to unemployment benefit and assistance for

many groups of females in the working-age population. The gradual discarding of discriminatory conditions not only allowed access to employment and unemployment, but also enabled women, on average, to remain in those states for longer durations.

Another notable feature of these developments is the significant contraction in the number of younger females in employment. This ensured that their share in the labour force declined in every decade. By 1993 younger females only made up 27 per cent of the female labour force, while their share of female employment declined to 23 per cent. However, despite their contracting share in employment, younger females maintained a 54 per cent share of total female unemployment. By way of comparison, younger males had a similar experience in employment performance relative to older males, but they represented a smaller proportion of male unemployment. Specifically, by 1993, only 26 per cent of the male unemployed were under 25 years old.

Using the limited data available on female demographics, it is our contention that the contraction in the number of younger females in the labour force was primarily a consequence of poor employment opportunities that led to large outward migration flows. In Table 3 we decompose the growth in the female working-age population into natural increases and changes induced by migration movements. The natural increases in the working-age population indicated in this table suggest that the number of younger females in the working-age population did not decline over the period. It may also be seen that the net migration flows since the early 1980s were negative. Given the relative absence of younger females from the substantial labour force growth, it is arguable that it was the younger females that dominated the outward migration flows. Detailed information on Irish migration flows has only been available from the Central Statistics Office (CSO) since 1987 and in Table 4 we

summarise that information for females. It can be seen that there is clear support for the previous suggestion. While Table 4 says nothing directly about the period prior to 1987, and while only net migration figures are available for this earlier period, nevertheless it is suggestive of some interesting insights into what might have transpired in previous years, given the shortcomings of net migration data. The fact that net flows are close to zero does not imply that migration flows are small. The turnover activity in the early 1990s is as large as in the late 1980s, even though the corresponding net migration figures are very different. The fact that aggregate net flows are negative does not imply that outward migration dominates for all groups in the labour market. Net flows were positive for older females and negative for younger females in the early 1990s. The age composition of inward flows can be quite different from that of the outward flows. Younger females are generally more prominent in the outward migration flows. It is therefore highly plausible that the patterns of large inward and outward migratory movements that we see in Table 4 for recent years extend back to the earlier part of the sample period that we use for our empirical analysis below.

A final feature of female labour force developments is the convergence of the participation rates of younger and older females. The primary reason for the decline in the younger females participation rates, even in the face of the large outward migration flows, was their increasing involvement in third level education. In common with the phenomenon of migration, this also may have been a reaction to the less than adequate availability of employment for younger women. In contrast, there was an increase in the participation rate of older women which was due primarily to an expansion in their employment level induced, we feel, by the legislation changes described in Section II.

Given our central concern in the remainder of this paper, which is the

modelling of the quarterly flows into and out of the Live Register, this overview of labour force developments suggests that two points may be of great importance. Firstly, there has been a significant increase in the numbers of young and old in female unemployment. We feel that this may be due to relaxation of discriminatory legislation and could be central in explaining female unemployment flow movements. Secondly, given the natural increases in the younger female working-age population and the large migration movements of this group, there is the possibility that these factors have also had a large impact on turnover in the female unemployment pool and so must be controlled for in our analysis. In the next section we examine the movements in the quarterly flows and put forward propositions that provide the basis of our econometric agenda in Section V.

IV Female Unemployment Flows

Our primary concern in the remainder of this paper is to measure the impact that anti-discriminatory reforms relating to female unemployment assistance and benefit have had on female unemployment flows in the Live Register. Thus we now analyze the Live Register stock and flow data with a view to subsequent modelling of the inflows and outflows.

The fundamental identity for the construction of the required flow data is one that relates the stock of unemployed females at time $t+1$ (TU_{t+1}) to the stock at time t (TU_t), and the total number of newcomers to the Live Register (I) and the total number who left the Register (O) during the intervening period, namely,

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

where, in an obvious notation, $t \rightarrow t+1$ denotes a three-month period between time points t and $t+1$. Using this identity, quarterly series for the flows of females in to the Irish Live Register, $I_{t \rightarrow t+1}$, and the flows of females out of the Register, $O_{t \rightarrow t+1}$, were constructed in the same manner as Harrison and Walsh (1994a) constructed flow data for males using the basic methodology of Lehmann (1993). These inflows and outflows, together with the unemployment stock, are plotted for females and males in Figures 1 and 2, respectively. Each series has been smoothed using a five-point moving average to bring out the essential trends.

It can be seen from Figure 1 that female inflows and outflows were generally increasing during the 1980s and early 1990s. Turnover in the female unemployment pool, i.e. the sum of inflows and outflows, fluctuated during the 1970s at low levels, but persistently increased over the 1980s to reach, by the early 1990s, a level four times that of the 1970s. The annual turnover in the 1970s was in the region of 80,000 females, while by the early 1990s it had quadrupled to 320,000. Given the significance of the female quarterly turnover activity in both decades, it would seem to be worthwhile to investigate further the information embodied in the flows, yet absent from stock data.

The stock of unemployment at any given time results from a compounding of individuals that have inflowed, but have failed to outflow from the Live Register, prior to the time of stock-taking. In contrast, flow analysis measures the turnover of individuals within a specified period. Clearly the attributes of individuals in the turnover and in the stock in a specified period can be quite different. Strobl and Walsh (1995) estimated that while the stock of females evolved over time to comprise 66 per cent of older females, with 36 per cent of all females in duration categories over a year, female turnover activity for any given period was generally characterized by a larger proportion of younger

females; they also showed that outflows were predominantly from duration categories under a year. These patterns were similar to, but less extreme than, those found when comparing the male stock and flows attributes.

In comparing Figures 1 and 2, it is apparent that the trends found in the male and female unemployment flows are also very similar. This suggests that the evolution of the two series may have been determined by common or very similar causes. The determinants of the male flows have been studied by Harrison and Walsh (1994b) and they have shown, using a small open regional labour market framework, that the key control factor for the male flows was economic activity in Great Britain. Due to the high degree of product and factor market integration, employment movements and migration flows in Ireland respond substantially to economic activity in Britain. Given the similar trends, we expect the turnover activity in female unemployment to be heavily influenced by British economic activity as well. Yet despite the similarity in trends, it must be noted that female flows increased relative to those of males over the sample period. In Figure 3 we graph the female share of total unemployment stock, inflows and outflows. The share of females in the unemployment stock in the late 1960s was only 17 per cent and by the early 1990s it had increased to 34 per cent. Similarly, in the late 1960s, the share of females in the flows was 20 per cent and, by the early 1990s, their share had increased to 40 per cent. It is our contention that the gradual convergence in the levels of flows since the late 1960s resulted from the progressive elimination of discriminatory legislation that gave all females the same access to, durations of, and payment levels of unemployment benefit and assistance as males.

Given the similar trend in female flows relative to male flows, and the gradual convergence in levels, the agenda for our empirical section is to test the proposition that legislation changes have acted as shift factors in the

determination of the female flows, while the female flow trends themselves can be explained by migration and employment flows within the British Isles. However, one would also expect that female flow behaviour could be different from that of males in that female flows between non-activity and the labour force can be part of a household decision. The status of the males in the labour force and number of children in the household can induce female flow movements which are not systematically related to economic activity in the British Isles or legislative changes. We expect these effects to be represented in aggregate as a random element.

IV The Empirical Evidence

The discussions in the previous sections are suggestive of the possibility of a number of interesting relationships between the female Live Register flows and the impact of legislation changes and economic activity in Great Britain. In this section, we model the female inflows (IRLINF) as a function of inflows to the British Live Register (GBIN), which is assumed to be exogenous since Ireland is a small region within the British Isles, and exogenous legislation variables. The female inflows can be influenced by economic activity in Britain as proxied by GBIN in two ways. First, employment and hence inflows may change via trade and capital flows in response to economic activity in Britain. In integrated markets periods of simultaneous job destruction can take place in Britain and Ireland. Further, it seems possible that the break with sterling on entry to the ERM might have modified this link, and therefore it seems worthwhile to explore the separation of the effect by means of a suitable structural break variable (GBIN*D1). Secondly, outward migration in response to British economic activity coming either from a state of non-activity or

employment, i.e. a reduction in potential entrants to the Live Register, would curtail the inflows to unemployment. The legislation reforms are expected to act as shift factors in this relationship between IRLINF and GBIN. The inflows up to 1978 could only come from the employment state as females generally needed employment contributions to gain access to benefit and assistance. In other words females could not enter the labour force via unemployment. Since 1978 inflows could also be driven by increases in the female working-age population. This is something that is not controlled for in our modelling of female inflows. Yet we do expect the impact of legislation changes on the inflows to depend on the number of females in non-activity, or other states, made eligible for unemployment support at the time of the change. The size of the female working-age population at the time of implementation of reforms will clearly affect the magnitude of the effect of the reforms on the inflows.

The female outflows (IRLOUTF) will be modelled as a function of outflows from the British Live Register (GBOUT) and a weighted GDP index (WGDP) that gives Britain a 100 per cent weighting up to 1980 and 60 per cent thereafter. The additional WGDP variable in this equation is included to capture the changing patterns of migration over the sample period, as will be explained in more detail below. The two explanatory factors are considered to be proxies for labour market conditions for unemployed job seekers and product market conditions in Great Britain and elsewhere. For the same reason as that given above for the exogeneity of GBIN, there seems little doubt that GBOUT and WGDP are exogenous.

One channel through which these variables influence the Irish unemployment outflows is via the product and capital market effects on Irish employment movements. In the 1970s in particular, when the small Irish region was integrated with all British markets, periods of job creation would coincide

in Ireland and Great Britain. In the 1980s, product and capital markets became considerably less integrated, and the significance of this link was almost certainly greatly reduced. Another way in which these variables induce outflows is via migration. This has always been significant and grew stronger during the 1980s, but migration patterns changed in the 1980s. The CSO provides us with the country of destination of outward migration flows only since 1987. In fact 60 per cent went to Britain, 14 per cent to the US, 10 per cent to continental Europe and 16 per cent to the rest of the world. Unemployed female job searchers faced the problem that any available jobs could always be filled by males and females coming in as new entrants to the labour force, or as job-to-job movers, including inward migrants. Outward migration was of course an option for such job seekers. As indicated in previous Sections, there has indeed been a contraction in the share of younger females in the Live Register stock and in the labour force since the early 1980s. Yet they have a conspicuous presence in the unemployment turnover. All of this evidence leads us to suspect the strong possibility that outward migration flows, induced by economic activity in Great Britain and elsewhere are important over the entire period but particularly since the early 1980s. One normally would suspect that migration decisions are not just based on signals of good or bad economic activity external to the economy. Individuals would calculate the relative probabilities of being employed or unemployed and hence the relative present discounted value of income. Individuals would also take into account the costs of moving from one country to another and the costs of job search in another country. Since the famine the Irish have developed an extremely powerful migration infrastructure. Most unemployed job searchers are faced with a very small probability of employment in Ireland and a large probability of employment in the country of destination. The set-up and search costs are minimised by an advanced

infrastructure, organised by family or friends of family, that give free accommodation and often the offer of immediate employment. This is why we feel that better product and labour market conditions in a historically popular country for Irish migrants is enough to induce outward migration flows from unemployment. We expect this second channel to dominate from the early 1980s onward, hence adjustment to the WGDP variable, mentioned above. Irish Females.

The effects of the legislation variables in the relationship between IRLOUTF, WGDP and GBOUT are certainly more complicated, and therefore less easy to predict, than the effects in the inflow equation. However, given that some of the reforms have influenced the duration of the receipt of benefit, therefor it seems possible that they may serve to decrease outflows.

We now explore our quarterly data sets, for the period 1967-1 to 1993-4, and the suggested relationships more systematically using some recent techniques of time series econometrics. Specifically, the stationarity/non-stationarity properties of the individual series are examined using several unit root tests, and the specified equations are investigated by means of error correction models and the concept of cointegration. In all cases the economic data series are seasonally unadjusted, while the dummies, described in detail in Table 1, are the usual zero-one type which take the value unity as and from the date of implementation of the associated legislation. While the use of unadjusted data may avoid distortion of the dynamics in estimated models, as pointed out by Wallis (1974), the presence of seasonality in the series complicates the testing and estimation procedures used in modelling cointegrated variables. In particular the definition of integration must be modified to include seasonality and the tests for integration must cover the possibility of seasonal unit roots.

Thus we begin by applying the so-called OCSB test proposed by Osborn

et al. (1988) to each of our economic variables of interest. This procedure tests the null hypothesis that a variable, y_t , is generated by a stochastic process that is $I(1,1)$ against the alternatives $I(1,0)$ and $I(0,1)$, where $I(n,s)$ denotes that the variable is stationary after first differencing n times and seasonal (i.e fourth) differencing s times. The test results are given in Table 5, together with the 5 per cent and 1 per cent critical values obtained from Osborn (1990). The possibility of non-stationary seasonality is rejected by the β_2 statistic for all series except GBOUT, although in this case the joint F test rejects the null of $I(1,1)$. Indeed the null hypothesis is overwhelmingly rejected for all of the series on the basis of the F test. By contrast, the β_1 statistic strongly suggests the existence of a non-seasonal unit root for all series.

A well known drawback of the OCSB test is that it does not permit testing for all possible unit roots in the seasonal process, i.e. the roots corresponding to all of the factors of the seasonal difference operator $1 - L^4$. Consequently a further check on non-stationary seasonality was undertaken using the so-called HEGY test due to Hylleberg et al. (1988) which does allow for these possibilities. Given the decisive rejection of the null of $I(1,1)$ by the previous test, a form of the HEGY test which allows the null of $I(0,1)$ to be tested against the alternatives of $I(1,0)$ and $I(0,0)$ was chosen. The results of this procedure are presented in Table 6 along with the 5 per cent and 1 per cent critical values. The F statistics signal a strong rejection of complex unit roots in the case of all variables; and together with the t statistics associated with π_2 the hypothesis of non-stationary seasonality is firmly rejected for for all variables except IRLOUTF. However the test statistic on π_2 and π_3 are very close to the 5% critical value and the balance of the evidence clearly suggests that seasonal unit roots are unlikely to be a feature of our data series. By contrast, the statistics for π_1 provide firm evidence of a unit root at the non-seasonal

frequency in the case of all variables tested.

As a final check, therefore, the variables were subjected to standard Dickey-Fuller (DF) and augmented Dickey-Fuller (ADF) tests, where the null hypothesis of a non-seasonal unit root, $I(1, 0)$, is assessed against the alternative of $I(0, 0)$ by means of a t-type statistic. The results are given in Table 7 for variants of the test with up to four lags, and with and without a deterministic time trend. In accordance with the earlier tests, the conclusion that emerges from Table 7 is that of strong evidence for the existence of a non-seasonal unit root in each of the five economic data series investigated.

In the light of these preliminary findings, exploration of the impact of legislative changes on the flows of females into and out of the Irish Live Register and the possible links between these flows and the flows into and out of the British Live Register proceeded by means of modelling along the lines of the Engle-Granger (1987) two-step procedure. Thus, for both the inflow relationship and the outflow relationship, the earlier unit root tests were first supplemented by tests for cointegration using ordinary least squares (OLS) residuals from static models in the levels of the variables for the sample period. Both the cointegrating regression Durbin-Watson (CRDW) and the Dickey-Fuller (DF) tests were employed, the former perhaps being preferred because, as Bhargava (1986) has shown, it is less likely to be influenced by the inclusion of the constant in the static models. However, due to the possibility that more than one cointegrating vector may exist when a relationship contains more than one integrated variable, the Johansen (1988, 1989) procedure was also employed in the case of the outflow equation. Secondly, given that there were clear indications that Irish female inflows and British inflows and also Irish female outflows and British outflows and WGDP are cointegrated, error-correction models were constructed for both relationships. All computations were done

using the MIROFIT 3.0 econometric package of Pesaran and Pesaran (1991).

In accordance with the discussion above, there seems little doubt that the static inflow equation contains explanatory variables that are at least weakly exogenous in the sense of Engle et al. (1983), and therefore that the inflow equation constitutes a valid conditional model. Given this exogeneity, the results of Park and Phillips (1989) may be used to provide asymptotic justification for the use of standard t statistics in order to assess the significance of the legislative dummies, and other variables, in the static equation. The results for the static female inflow equation are given in Table 8 which do not contain parameter estimates for statistically insignificant dummies. In this case, because only two economic variables are involved and hence only one cointegrating vector is possible, the Johansen procedure was not employed. The CRDW and DF tests clearly indicate cointegration. The shifts associated with the legislative dummies appear to be very important as does that associated with the 1979 to 1989 period. The construction of an error-correction model (ECM) for IRLINF was explored, starting with a general model incorporating several lags of the differenced variables as well as the usual error-correction term and seasonal dummy variables, and employing a progressive simplification strategy to obtain a reasonably parsimonious representation. The estimates and test statistics for the preferred ECM for the Irish female inflows are reported in Table 9. The error-correction model does not contain legislative dummies, of course, as these are long-run influences; their effect on the short-run behaviour of the flows operates indirectly through the error-correction term. The results appear to be quite satisfactory except for the poor fit and the rejection of normality obtained in the case of the dynamic equation for the female inflow. In view of this, the diagnostics presented in Table 9 were supplemented by further detailed residual analysis aimed primarily at establishing the randomness of the disturbances.

These additional tests included the CUSUM and CUSUMSQ procedures and the calculation of the residual correlogram and associated Box-Pearce and Ljung-Box statistics. Except for some departures from the region of non-significance on the CUSUMSQ plot, all of these further checks were consistent with the null hypothesis of random disturbances. With regard to the outcome in the normality test, it appears that the distribution of residuals has considerably heavier tails than the normal distribution due to a fairly large number of outliers towards the end of the sample period in particular. Indeed, it is probably this fact that explains the CUSUMSQ finding just mentioned. Overall, there seems little doubt about the randomness of disturbances and hence the basic adequacy of the equation. As can be seen from Table 9, the variable DIRLINF is significantly positively associated with contemporaneous changes in the British inflow, and the coefficients of the error-correction term and the lagged change in Irish female inflow are even more significant statistically, indicating the importance of the equilibrating tendency resulting from departures from the long-run relationship in the previous quarter, and the inertia in the dynamic inflow adjustment activity which extends back to the corresponding quarter of the previous year.

Table 10 presents the proportional impact of the significant legislation variables on IRLINF, namely, D77, D78, D82 and D86, calculated as a proportion of its average value since the date of implementation of the legislation in question. We would not want to attach too much weight to the estimated effects of these dummies, since they model clearly defined discrete shifts and the actual dynamics of the effects of legislation were almost certainly considerably more complicated than may be captured by such simple proxies. None the less, it is noteworthy that the more significant of the estimated effects are those corresponding to the legislation changes which gave large numbers of

females in non-activity the option of accessing the Live Register without the need for employment contributions.

Table 10 also gives the long-run elasticities of IRLINF with respect to GBIN using the means of the variables in the 1970s, 1980s and 1990s, as well as the overall sample period. The results confirm the importance of the effect of economic activity in Britain in explaining the Irish female unemployment inflows, conforming well to expectations. Moreover, they also confirm that the link did appear to be weakened during the period in which Ireland operated a different exchange rate regime than Britain. Overall, we feel the results constitute important direct evidence of the primary impact that legislation changes and the secondary impact that British economic activity have had on the overall level of the inflow of females into the Live Register in Ireland. However, recalling our short-run results, a great deal of the quarterly dynamic behaviour of the female inflows has been random, as was anticipated.

Turning to the outflow analysis, just as in the cointegrating regression for the inflow, the explanatory variables in the static outflow equation are all properly exogenous. An additional implication of this fact is that an error-correction term should only enter the equation for the IRLOUTF variable of interest, and that the Johansen method should confirm a single cointegrating vector and produce maximum likelihood results in accord with those obtained from the static regression. The OLS results for this equation, together with the CRDW and DF statistics and the Johansen results are given in Table 11. The CRDW and DF values both firmly suggest rejection of the null hypothesis of no cointegration, and the Johansen results confirm the existence of a single cointegrating vector. The results for the preferred form of ECM, chosen using a strategy similar to that used for the inflow equation, are presented in Table 12. On the basis of the range of standard test statistics reported, we regard this

result as a very satisfactory description of changes in the Irish female outflow series. Once again, the adequacy of the dynamic model was confirmed by several further mis-specification checks, but details of these are not reported. As can be seen, the adjustments in the quarterly outflow of females from the Irish Live Register are significantly positively correlated with contemporaneous changes in the British outflow, the lagged change in Irish outflow and the seasonal effect in the third quarter. They are of course negatively correlated with the error-correction variable. The coefficients of the error-correction term and the lagged change in Irish outflow are even more significant statistically, as was the case in the ECM for inflow.

However, our main concern is with the impact of the empirically significant legislation dummy variables, and so attention centres on the information provided by the results in Table 11. Hence, using the estimated coefficients from the cointegrating regression, Table 13 gives the magnitude of the negative impacts on IRLOUTF of the two significant legislation variables, D77 and D79, calculated as a proportion of the inflow using its average value since the date of implementation of the legislation in question. Table 13 also reports the long-run elasticities of IRLOUTF with respect to GBOUT and GDP evaluated at the means of the variables using the cointegrating coefficient estimates. The combined long-run elasticity of Irish outflows with respect to these economic activity variables is considerably greater than unity for the sample period as a whole as well as in each of the three decades considered, and especially in the 1980s.

Overall, and in contrast with the inflow situation, the results provide evidence of the primary impact that external economic activity has had on the level of the female outflow which, in the light of our arguments above, we feel are driven essentially by migration flows. They also suggest that legislation in

this case has had a secondary role, and appear to support our hypothesis that reforms have led to females remaining in the Live Register for longer durations, hence reducing the turnover activity. With regard to the dynamic behaviour of outflows, it remains the case that, like the inflow equation, there is a significant element of random, unexplained variation in outflow changes. However, given the significance of GBOUT and the seasonal dummy for the third quarter, it appears that migration flows, particularly in the summer months, may have had a moderately large impact on the changes in the quarterly female outflows.

VI CONCLUSION

Ireland provides a unique context in which to study the effects of anti-discriminatory legislation changes on the movements of females in to and out of the Live Register as it has been characterized by explicit discrimination against females with regard to entitlement to unemployment assistance and benefit. Legislation itself defined discrimination and allowed us to assess the effect of reforms on the female unemployment flows. Overall, we feel that our results constitute important direct evidence that these anti-discriminatory reforms have had a significant impact on these flows. They clearly model well defined discrete shifts in the inflows, and it is noteworthy that the more significant of the estimated effects are those corresponding to the legislation changes which gave the large numbers of females that were in non-activity the option of entering the Live Register without the need for employment contributions. The results also provide evidence of a secondary role for reforms in relation to the overall level of female outflows from the Live Register; they appear to support the hypothesis that the legislation changes have encouraged females to remain in the Register for longer durations and, as a result, have reduced the turnover

activity.

In modelling the impact of the changing anti-discriminatory legislation on female unemployment behaviour, we also produced evidence that suggests that employment and demographic movements of females respond in a significant way to economic activity outside the economy. The results provide strong evidence of the impact that external economic activity has had on the level of the female flows which, in the light of our arguments above, we feel are driven essentially by migration flows.

Normally the modelling of female behaviour in the labour market can be complex and we do find a sizeable amount of random behaviour in the short run variations of the flows, particularly of inflows. Yet we believe that we have shown that the anti-discriminatory reforms and migration movements have considerable power in explaining the magnitude of female turnover activity in the Irish Live Register.

Table 1 - Discriminatory Legislation Changes

Dummy Variables¹

Unemployment Assistance

General Qualifying Conditions:
 - between 18 and 70 years of age (old pension qualifying age)²
 - satisfaction of a means test

Special Conditions:

1. *widows & single women* :

a) must have at least one dependent or must have at least 52 employment contributions in the four contribution years preceding the contribution year in which her claim was made
 b) only employment contributions made at the ordinary rate are be credited

2. *married women* - must not be dependent on husband and must have at least one dependent

- D73 1973 (October) - Special Condition 1(b) is abolished
- D77 1977 (April) - with regard to Special Condition 1(a), the number of employment contributions required to be paid in respect of a *widow or single woman* who has no dependent are lowered to 26
- D78 1978 (October) - Special Condition 1(a) for *widows & single women* is abolished
- D82 1982 (April) - with regard to Special Condition 2, UA was extended to *married women without child dependents who are separated from and not supported by their husbands*
- D86b 1986 (November) - with regard to Special Condition 2 a *gender neutral definition of a spouse dependent* is introduced: A person will only be regarded as dependent on her/his spouse where he or she is being wholly or mainly supported by that person

Unemployment Benefit

General Qualifying Conditions
 - under 70 years of age (old pension qualifying age)
 - no less than 26 employment contributions (Employment contributions) have been paid for the beginning of the benefit year³ in which the claim for UB is made
 Length of benefit: 312 days

Requalification Conditions:

- a further 13 employment contributions paid, where employment contributions paid during the second of the 156 days of UB are reckonable

Special Conditions:

1. those *under 18* and *married women living with or wholly or mainly maintained by her husband*:

a) reduced personal rates
 b) duration of receipt of benefit only 156 days

2. *women employed in private domestic service or agriculture* must have ten years of employment contributions paid in their behalf before they are eligible for UB

3. *women who marry* will disqualify (regardless of how many employment contributions they accumulated prior to marriage) from the receipt of UB until 26 employment contributions have been paid on their behalf

- D73a 1973 (July) - Special Condition 2 is abolished
- D73 1973 (October) - Special Condition 3 is abolished
- D79 1979 (April) - with regard to Special Condition 1(b), the length of receipt of UB are extended for *married women living with or wholly or mainly maintained by her husband* to 312 days⁴
- D86 1986 (May) - with regard to Special Condition 1(b), reduced personal rates for *married women* and *under 18 years old* claimants were replaced by standard rates; duration of their entitlement to UB was increased to 390 days for both groups
- D86b 1986 (November) - with regard to Special Condition 1, a *gender neutral definition of a spouse dependent* is introduced: a person will only be regarded as dependent on her/his spouse where he or she is being wholly or mainly supported by that person

¹ Abbreviations in this column denote associated dummy variables which are described and used in Section V.

² Over the period 1967-1977 the old pension qualifying age was incrementally reduced to 66 years.

³ Employment contributions required to receive UB were increased to 39 in May 1987.

⁴ As of April 1976 the maximum period for which UB may be paid was extended to 390 days for those not subject to Special Conditions.

Table 2
The Growth in the Labour Force decomposed into
Employment and Unemployment by age categories, under
and over 25 years(Percentages)

		$\Delta L/L$	\equiv	$\Delta E/L +$	$\Delta U/L$
1971-1981	Total	25.0	\equiv	18.7 +	6.3
	< 25	9.5	\equiv	5.6 +	3.9
	> 25	15.5	\equiv	13.1 +	2.4
1981-1989	Total	12.4	\equiv	8.3 +	4.1
	< 25	-6.0	\equiv	-8.1 +	2.1
	> 25	18.4	\equiv	16.4 +	2.0
1989-1993	Total	16.4	\equiv	13.0 +	3.4
	< 25	-2.7	\equiv	-3.9 +	1.2
	> 25	19.1	\equiv	16.9 +	2.2

Table 3
The Growth in the Working-Age-Population Decomposed
into Natural and Migration induced Changes (Percentages)

		$\Delta WAP/WAP$	\equiv	$\Delta Natural/WAP$	$\Delta Mig./WAP$
1971-1981	Total	17.4	\equiv	13.7 +	3.7
1981-1989	Total	8.0	\equiv	11.6 -	3.6
1989-1993	Total	4.2	\equiv	6.7 -	2.5

Table 4
Female Inward and Outward Migration Flows by Age, under
and over 25 years (000)

	Inward Migration -	Outward Migration	Net
1987-1990	Total: 47.0	- Total: 104.7	= -57.7
	< 25 : 23.5	- < 25 : 72.2	= -48.7
	> 25 : 23.5	- > 25 : 32.5	= -9.0
1990-1994	Total: 67.9	- Total: 75.2	= -7.3
	< 25 : 33.8	- < 25 : 53.6	= -19.8
	> 25 : 34.1	- > 25 : 21.6	= 12.5

Table 5: Results of OCSB Test of Non-Stationary Seasonality

Null:	I(1, 1)			
Alternative:	I(1, 0) or I(0, 1)			
	$\beta_1 = 0$	$\beta_2 = 0$	$\beta_1 \& \beta_2 = 0$	p
IRLINF	-2.55	-4.51	24.10	3
IRLOUTF	-2.64	-5.69	28.29	1
GBIN	-0.96	-5.72	29.35	2
GBOUT	-2.04	-3.23	9.21	2
WGDP	1.82	-8.33	44.89	2
1% C V	-2.82	-4.35	4.80	
5% C V	-2.11	-3.75	3.79	

The test is conducted by estimating the regression equation,

$$(1-L)(1-L^4)y_t = \alpha_1 Q_{1t} + \alpha_2 Q_{2t} + \alpha_3 Q_{3t} + \alpha_4 Q_{4t} + \beta_1 (1-L^4)y_{t-1} + \beta_2 (1-L)y_{t-4} + \sum_{i=1}^p \phi_i (1-L)(1-L^4)y_{t-i} + \epsilon_t$$

and carrying out separate one-sided t-type tests on the non-seasonal unit root ($\beta_1 = 0$) and the seasonal root ($\beta_2 = 0$) and also a joint F test of $\beta_1 = \beta_2 = 0$. The Q_{it} , $i = 1, \dots, 4$, are seasonal dummies used, as suggested by Perron (1988), to allow for the possibility that the test statistics may be influenced by the four starting values of y_t ; and the value of p is chosen so as to yield random residuals.

Table 6: Results of HEGY Test of Non-Stationary Seasonality

Null:	I(0, 1)						
Alternative:	I(1, 0) or I(0, 0)						
	p	$\pi_1 = 0$	$\pi_2 = 0$	$\pi_3 = 0$	$\pi_4 = 0$	$\pi_1 \& \pi_4 = 0$	δ
IRLINF	0	-1.38	-4.92	-4.11	-4.15	20.64	2.24
IRLOUTF	1	-1.26	-2.86	-2.26	-5.51	17.52	2.25
GBOUT	2	-0.63	-3.91	-1.72	-4.11	10.27	0.68
WGDP	2	-2.29	-4.09	-4.94	-3.42	21.06	2.42
GBIN	2	-2.86	-3.86	-2.77	-3.33	10.63	-1.27
1% CV		-4.15	-3.57	-2.71	-4.05	8.77	-3.46
5% CV		-3.52	-2.92	-2.28	-3.44	6.62	-2.31

The procedure is based on an estimate of the equation

$$(1-L^4)y_t = \alpha_1 Q_{1t} + \alpha_2 Q_{2t} + \alpha_3 Q_{3t} + \alpha_4 Q_{4t} + \delta t + \pi_1 Z_1 y_{t-1} + \pi_2 Z_2 y_{t-1} + \pi_3 Z_3 y_{t-1} + \pi_4 Z_4 y_{t-1} + \sum_{i=1}^p \theta_i (1-L^4)y_{t-i} + \epsilon_t$$

where $Z_1 = 1 + L + L^2 + L^3$, $Z_2 = -(1 - L + L^2 - L^3)$ and $Z_3 = -(1 - L^2)$, and the trend variable t , like the seasonal dummies, is included in the light of the arguments of Perron (1988). The existence of non-stationary seasonality, i.e. $y_t \sim I(0,1)$, is not rejected unless π_2 and either π_3 or π_4 are statistically non-zero. In similar fashion to the OCSB test, the HEGY test focuses on separate one-sided t tests of the individual unit root possibilities $\pi_k = 0$, $k = 1, \dots, 4$, as well as on a joint F test of $\pi_3 = \pi_4 = 0$.

Table 7: Results of DF and ADF Tests for Non-Seasonal Unit

<u>Roots</u>					
Null:	I(1, 0)				
Alternative:	I(0, 1)				
	<u>DF</u>	<u>ADF(1)</u>	<u>ADF(2)</u>	<u>ADF(3)</u>	<u>ADF(4)</u>
<u>(a) Without Trend</u> 5% CV = -2.89					
IRLINF	0.29	0.38	1.20	1.67	0.49
IRLOUTF	-0.58	0.56	0.81	2.20	1.39
GBOU	-4.62	-3.56	-2.29	-1.19	-2.01
WGDP	0.14	-0.12	0.20	1.00	0.66
GBIN	-3.16	-2.83	-2.51	-2.00	-3.13
<u>(a) With Trend</u> 5% CV = -3.45					
IRLINF	-2.45	-1.97	-1.58	-1.39	-1.55
IRLOUTF	-3.32	-2.06	-1.57	-0.74	-1.47
GBOUT	-5.06	-3.80	-2.18	-0.49	-1.70
WGDP	-1.51	-1.65	-1.76	-2.51	-2.37
GBIN	-3.33	-3.00	-2.53	-1.87	-3.41

Table 8: Results of Static (Co-integrating) Regression for

IRLINF

<u>Regressor</u>	<u>Coefficient</u>	<u>t-value</u>
Constant	-4.916	-1.78
GBIN	0.018	5.09
GBIN*D1	-0.014	-8.98
D77	3.997	3.53
D78	8.366	5.64
D82	8.154	8.73
D86	8.008	8.48

$R^2 = 0.944$ $CRDW = 0.938$ DF (for residuals) = -5.620

Table 9: OLS Results of ECM for IRLINF

Regressor	Coefficient	t - value
Δ IRLINF(-4)	0.408	4.81
Δ GBIN	0.007	2.31
ECM	-0.219	-3.29

$R^2 = 0.280$ $F_{2,98} = 19.014$

LM Tests for

(i) First-Order Autocorrelation:	$\chi^2_1 = 0.577$
(ii) Fourth-Order Autocorrelation:	$\chi^2_4 = 2.530$
(iii) Functional Form:	$\chi^2_1 = 1.119$
(iv) Normality:	$\chi^2_2 = 35.040$
(v) Heteroscedasticity:	$\chi^2_1 = 0.324$
(vi) ARCH:	$\chi^2_4 = 2.625$

Table 10: Elasticities, IRLINF

Proportional Impacts of Legislation

Legislative Dummy:	D77	D78	D82	D86
	0.179	0.354	0.301	0.252

Long-Run Elasticities at Mean of Variables

	1970s	1980s	1990s	Overall
GBIN	1.28	0.13	0.35	0.63

Table 11:

(i) Results of Static (Co-integrating) Regression for IRLOUTF

Regressor	Coefficient	t-value
Constant	-67.376	-20.43
GBOUT	0.016	4.34
WGDP	0.809	26.66
D77	-2.439	-2.21
D79	-2.007	-1.91

$R^2 = 0.939$ $CRDW = 1.523$ DF (for residuals) = -7.142

(ii) Results of Johansen ML Procedure non-trended (trended).

(Where r denotes the number of cointegrating vectors)

Maximal Eigenvalue Test

Null	Alternative	Test Statistic	5% CV	10% CV
$r = 0$	$r = 1$	21.35	22.00	19.77
$r \leq 1$	$r = 2$	9.79	15.67	13.75
$r \leq 2$	$r = 3$	3.85	9.24	7.53

Trace Test

Null	Alternative	Test Statistic	5% CV	10% CV
$r = 0$	$r \geq 1$	34.98	34.91	32.00
$r \leq 1$	$r \geq 2$	13.63	19.96	17.85
$r \leq 2$	$r = 3$	3.85	9.24	7.53

Normalised Estimated Co-integrating Coefficients

Variables:	Constant	GBOUT	WGDP
Coefficients:	-59.789	0.004	0.812

Table 12: OLS Results of ECM for IRLOUT

Regressor	Coefficient	t - value
Δ IRLOUT(-4)	0.500	6.17
Δ GBOUT	0.006	2.18
ECM	-0.454	-4.96
Seasonal 3	1.006	2.44

$R^2 = 0.612$ $F_{3,80} = 42.036$

LM Tests for		χ^2
(i) First-Order Autocorrelation:		$\chi^2_1 = 2.017$
(ii) Fourth-Order Autocorrelation:		$\chi^2_4 = 6.840$
(iii) Functional Form:		$\chi^2_1 = 0.443$
(iv) Normality:		$\chi^2_2 = 4.623$
(v) Heteroscedasticity:		$\chi^2_1 = 0.116$
(vi) ARCH:		$\chi^2_4 = 1.400$

Table 13: Elasticities, IRLOUTF

Proportional Impacts of Legislation

Legislative Dummy:	D77	D79
	-0.12	-0.09

Long-Run Elasticities at Mean of Variables

	1970s	1980s	1990s	Overall
WGDP	7.06	4.34	2.75	4.31
GBOUT	1.16	0.55	0.23	0.57

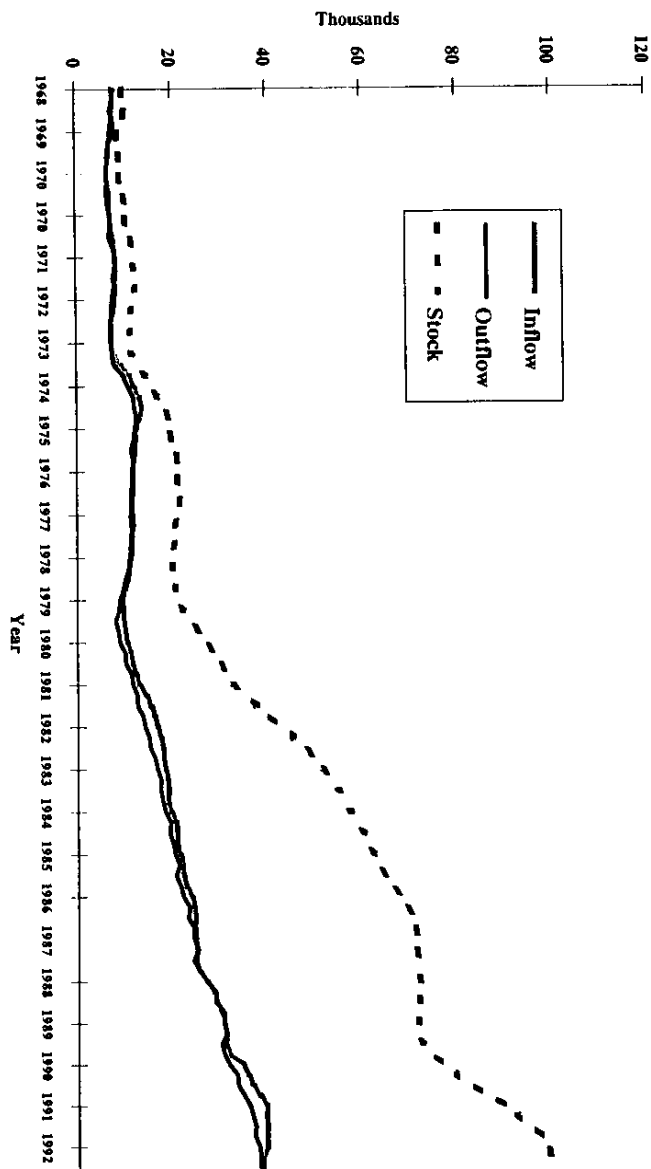


Figure 1 - Irish Female Stock, Inflow, & Outflow

Figure 3 - Irish Female Percentage of Total Stock, Inflow, & Outflow

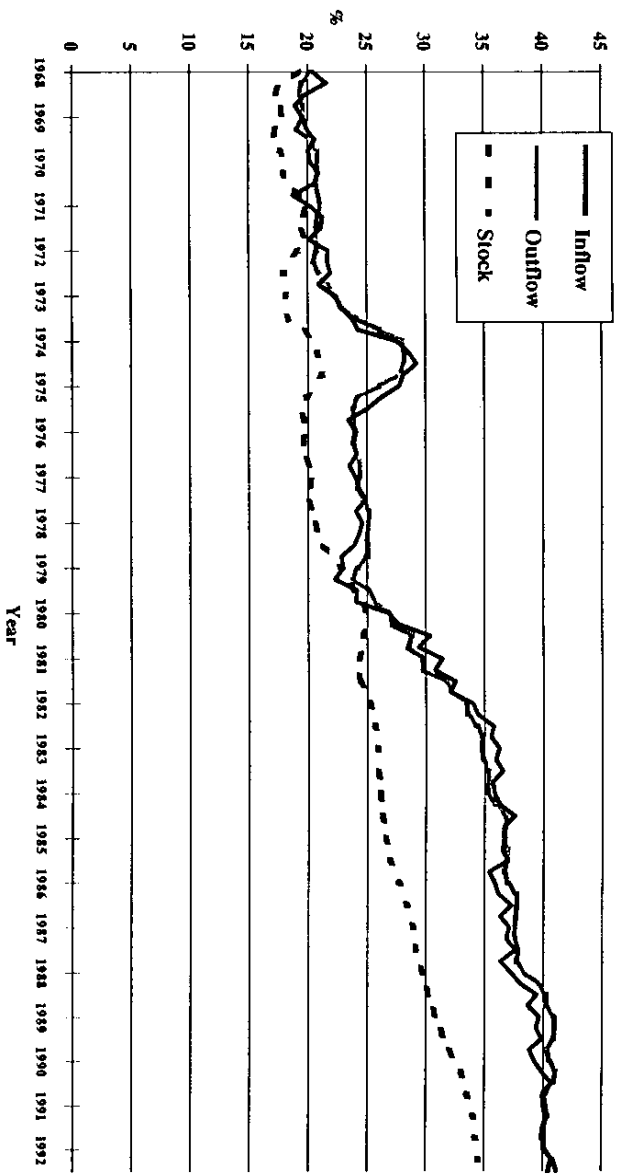
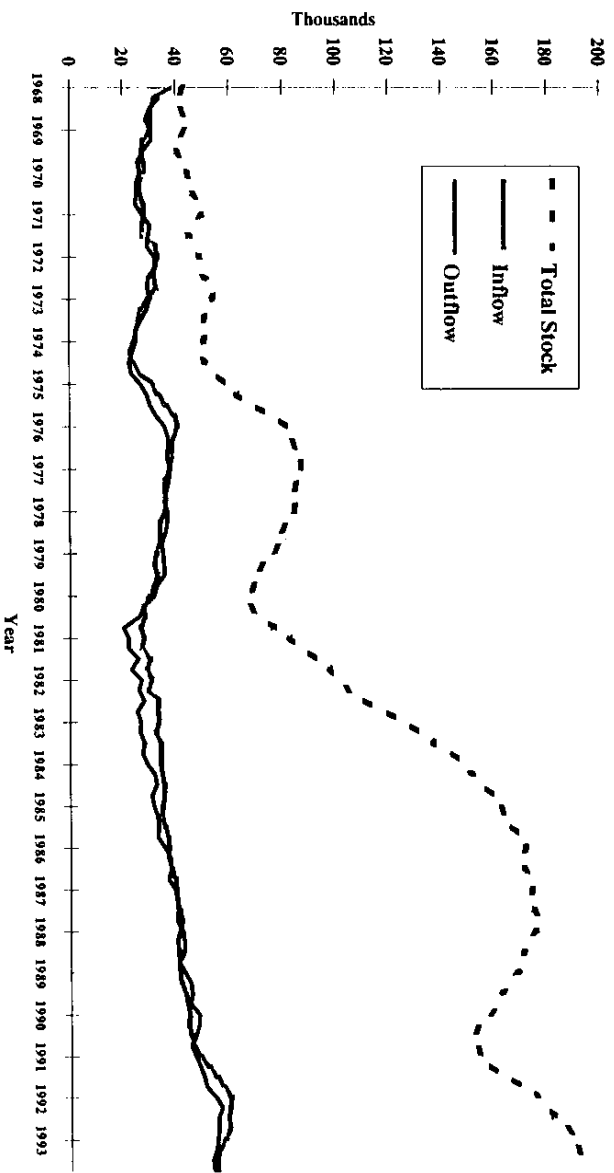


Figure 2 - Irish Male Total Unemployment Stock, Inflow, & Outflow



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