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Suicide in Ireland: The Influence of Alcohol and Unemployment

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Suicide in Ireland: The Influence of Alcohol and Unemployment

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Abstract:

In this paper we model the behaviour of the Irish suicide rate over the period 1968-2009 using the unemployment rate and the level of alcohol consumption as explanatory variables. It is found that these variables have significant positive effects on suicide mortality in several demographic groups. Alcohol consumption is a significant influence on the male suicide rate up to age 64. Its influence on the female suicide rate is not as well-established, although there is evidence that it is important in the 15-24 and 25-34 age groups. The unemployment rate is also a significant influence on the male suicide rate in the younger age groups. The behaviour of suicide rates among males aged 55 and over and females aged 25 and over is largely unaccounted for by our model. These broad conclusions hold when account is taken of a structural break in the 1980s, with the response to unemployment being greater in the earlier period and that to alcohol greater in the later period. The findings suggest that higher alcohol consumption played a major role in the increase in suicide mortality among young Irish males between the late 1960s and the end of the century. In the early twenty first century a combination of falling alcohol consumption and low unemployment led to a marked reduction in suicide rates, although there is some evidence that the suicide rate is being increasingly under-reported in recent years. The recent rise in the suicide rate may be attributed to the sharp increase in unemployment, especially among males, but it has been moderated by the continuing fall in alcohol consumption. Some policy implications of the findings are discussed.

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Io non averei creduto
Che morte tanta n'avesse disfatta

Dante, *Inferno*, Canto III

I. INTRODUCTION

Although still low compared with that of several northern and eastern European countries, by the late 1990s the Irish suicide rate had doubled compared to the level recorded in the 1960s. The rate among males aged 25-34 had risen more than four-fold. Suicide rates fell between the beginning of the century and 2007 but they have been rising again since then.

There have been many claims by journalists and advocacy groups that the recent increase is due to the recession.[3] In this vein Kelly (2009) warned that "Ireland is at the start of an enormous, unplanned social experiment on how rising unemployment affects crime, domestic violence, drug abuse, suicide, and a litany of other social pathologies".

There is evidence that the loss of income and social capital associated with recessions leads to higher suicide rates (see Helliwell, 2004, for a survey of the economic literature). Irish people who become unemployed report reduced life-evaluations, even after controlling for their lower income and they adapt to their situation very little over time (Brereton *et al*, 2008). Madden (2009) found that the fall in unemployment over the period 1994-2000 contributed to a reduction in the level of mental stress. There is also micro-level evidence that unemployment increases the relative risk of suicide in Ireland. Corcoran and Arensman (2010) report that over the period 1996-2006 the risk of suicide was much greater among the unemployed than among the employed, retired, and home-makers. They suggest that because unemployment is now rising "the recent period of stable Irish suicide rates may be over and that Irish suicide may increase again as in previous times of recession".

However, the evidence of a link between suicide and unemployment rates over time is not conclusive. Corcoran and Arensman (2010) report that "unemployment was a stronger factor where it was rare (2001-06) than in the period of decreasing unemployment (1996-2000)". The increased relative risk of suicide in a shrinking pool of unemployed people could reflect adverse selection, as those who remained unemployed in a buoyant labour market are those with the poorest mental health. It could also be the case that the stigma attached to unemployment increases as its prevalence falls. In their study of the impact of the Finnish economic boom and bust over the years 1985-95, Hintikka *et al*. (1999) found that completed

[3]See, for example, "Suicide on the Rise as Recession Takes its Toll", *Irish Independent*, June 30, 2010, "One in 10 calls to Samaritans relates to recession", *Irish Times*, July 1, 2010, and "Rise in Suicides as Money Woes Hit", *Sunday Independent*, July 18, 2010.

suicides, having risen during the boom, fell during the 1990-95 recession. On the other hand, in a panel study of the impact of the business cycle on specific causes of death in the states of the United States over the period 1972-91, Ruhm (2000) found that the total death rate and eight out of ten cause-specific death rates fell during recessions, but that suicide behaved counter-cyclically, rising during recessions and falling during booms. He concluded that while worsening economic conditions may improve physical well-being – due to reduced alcohol consumption among other factors – they have negative effects on some aspects of mental health, including the propensity to commit suicide. Finally, a recent EU cross-country analysis spanning the period 1970-2007 found that increases in unemployment were associated with higher suicide rates among those aged under 65 years (Stuckler *et al*, 2009).

A role for alcohol in Irish suicides has been claimed in many reports (see National Office of Suicide Prevention, 2001; Walsh, 2008). Some direct evidence is provided by Bedford *et al* (2006) who found high blood alcohol concentrations in young males who died by suicide in a sample of coroners' reports in three Irish counties in 2000 and 2001. The possible scale of the problem is indicated by Martin *et al* (2010) who assigned "alcohol-attributable fractions" drawn from the international literature to the Irish population classified by drinking patterns and concluded that over the years 2000-2004 37 per cent of male and 25 per cent of female suicides were attributable to alcohol. On the basis of their survey of the European evidence, Anderson and Baumberg (2006, p. 207) estimated that only one in six suicides was alcohol-related, although the ratio was higher among young males. Widely different methodologies have been used to ascertain the number of "due to" or "attributable to" drinking.

We would expect to find a link between the national levels of alcohol consumption and suicide mortality over time if, as hypothesised by Lederman (1956), increased average alcohol consumption in a population leads to an increase in the incidence of heavy and harmful drinking. There is some Irish survey evidence to support this hypothesis. Between 2002 and 2007, when average alcohol consumption per adult fell by 21 per cent, the self-reported incidence of weekly "binge drinking" among drinkers fell from 45 per cent to 28 per cent (Morgan *et al*, 2009, Figure 2). International studies of the link between aggregate alcohol consumption and suicide also support the Lederman hypothesis. In a study of the United States over the period 1934-87 Caces and Hartford (1998) found that when the unemployment rate was included in the model, *per capita* alcohol consumption was significantly related to the suicide rate, especially among young males. Hintikka *et al.* (1999) report that alcohol consumption was the only significant socioeconomic influence on the Finish male suicide rate between 1985 and 1995. Ramstedt (2001) found that international differences in average alcohol consumption were more closely correlated with suicide rates in so-called "dry" (mainly

Northern European) cultures than in "wet" (mainly Mediterranean) countries where alcohol is more regularly consumed. The results for Ireland over the period 1950-95 were not conclusive.

Previous Irish studies of the role of alcohol in society did not explore the link between the level of drinking and the suicide rate over time (see Walsh, 1980; Conniffe and McCoy, 1993; Mongan, Hope and Nelson, 2009). However, Lucey *et al* (2005) included expenditure on alcohol and the unemployment rate among the explanatory variables in their study of suicide trends in Ireland over the period 1968-2000. They concluded that there was no significant association between these variables and the suicide rate.

Thus there is a lack of firm empirical evidence to support the widely-held belief that the Irish suicide rate is influenced by fluctuations in the unemployment rate and trends in alcohol consumption. The purpose of the present study is to investigate the association between these variables using the time series evidence from 1968 to 2009.

II DATA

Table 1 displays the means and standard deviations of the principal series used in the study. The full sample period 1968-2009 has been divided into two sub-periods, 1968-1987 and 1988-2009 for reasons discussed below.

Details of deaths by cause are published in the *Reports of Vital Statistics* (Central Statistics Office 2009, and earlier years; Central Statistics Office, 2007 and earlier years). The classification system used is the World Health Organization's International Classification of Diseases, Injuries and Causes of Death. A narrow measure of suicide mortality would include only deaths classified as "suicides and intentional self-harm" (Codes E950-959). However, since the adoption of the Eighth Revision of the WHO's classification system in 1968 the new category of "deaths undetermined whether accidentally or purposefully inflicted" (Codes E980-989) should also be considered in the context of suicidal behaviour. This category was subsequently relabelled "deaths due to events of undetermined intent", which we refer to as UDs. These deaths are generally believed to include a high proportion of suicides that are not so classified due to the absence of conclusive evidence of intent.

Figure 1 shows the suicide rate per 100,000 population aged 15 and over[4] for the period 1961-2009 and the suicide plus UD rate for 1968-2009. It is clear that classification system is porous. There is a significant negative correlation between the suicide rate excluding UDs and the UD rate, which supports the belief that the two categories are substitutes. Following the 1968 revision to list of causes of death, a large number of deaths were classified as UDs. In fact,

[4]Annual population estimates by age group are available from the Central Statistics Office's Main Data Dissemination Service.

from 1968 to the mid-1970s more deaths were classified as UDs than as suicides. This supports the widespread belief that Irish suicide rates had been significantly underreported in earlier years (McCarthy and Walsh, 1966). However, in the mid-1990s the number of UDs fell to almost zero. This might have been an effect of the decriminalisation[5] of suicide in 1993 but number of UDs recorded began to rise again in the late 1990s and is now running at over a quarter of the combined total of suicides and UDs and UDs now account for over half of the combined total of suicides and UDs in the 65 and over age groups. In the1980s UDs due to drowning far exceeded those due to poisoning, but in recent years the reverse is the case. Since the 1990s there has been a significant negative correlation between the recorded number of UDs due to poisoning and Suicides due to poisoning ($r= -0.47$, $p < 0.05$). Even more striking is the fact that the number of "accidental deaths due to poisoning", which had been running in the region of 50 a year in the late 1990s, has soared to over 300 in the last three years, even as suicides due to poising fell to half its earlier level. Accidental and UD deaths by poisoning are concentrated among younger males, as is the case for suicides. All of these developments point to an increase in underreporting of the suicide rate in recent years. We have concentrated on the definition of suicide inclusive of UDs in the belief that it is likely to be a more consistent measure, although it is clear that the demarcation between the alternative classifications of deaths is not rigid.

We have calculated suicide rates for males and females in seven age groups from 15-24 years to 75 and over.[6] From Table 1 it may be seen that the male rates are consistently higher than the female rates. The pattern across age groups has, however, changed. In the earlier sub-period, 1968-1987, the highest suicide rates were among men aged 55-74 and women aged 45-64, in the 1988-2009 sub-period, the highest rates were among males aged 15-44 and among females the younger age groups had almost caught up with the middle age groups. This change in the gradient of suicide rates by age reflects the very pronounced upward trend in the rates for males between 15 and 54 and females aged 15-24, but the rates for males aged 55 and over and females aged 25 and over display less pronounced trends.[7] Of the 91 correlations coefficients between the 14 rates, only 26 are significant ($p \leq 0.05$) and most of these are between the strongly-trended young male rates. This brings out the importance of allowing for

[5]The classification of inquested deaths is strongly influenced by the opinion of a member of the Garda Síochána as to the intent of the deceased (see National Suicide Research Foundation, 2007).

[6]The small number of deaths among children under the age of 15 classified as suicides has been ignored.

[7]UDs now account for over half of the combined total of suicides and UDs in the 65 and over age groups.

the possibility that different effects are at work on different demographic groups and of using age-specific rates rather than a single age-standardised rate. Figure 2 highlights the rise in the suicide rates among young people by showing the three-year moving average of male and female rates in the age group 15-24. This is the only age group in which the male and female rates are so highly correlated.

While Irish suicide rates in many demographic groups are relatively high, the number of suicides recorded in most age groups in any year is generally low. There were only a handful of instances (mainly among young males in the early years of this century) where more than 100 suicides were recorded in an age group and in a sizeable minority of cases fewer than 10 were recorded. This consideration, combined with the classification issues discussed above, suggests that in many demographic groups the data may be relatively unreliable.

Unemployment rates by age and sex are not available before 1988. The unemployment rate for the whole labour force was used for both sexes for these years. For the period 1988-2009 separate male and female unemployment rates for five age groups from 15-24 to 55-64 were calculated from the results of the *Labour Force Survey* and *Quarterly National Household Survey.*[8] In marked contrast with the suicide rates by demographic group, all but one of the 45 correlations between the 10 age-specific unemployment rates were significant ($p \leq 0.05$). In 2008 and 2009, however, the increase in the unemployment rates among young males rose much more steeply than that in other demographic groups. The summary data in Table 1 shows that unemployment rates among younger adults of both sexes was much higher and more variable that that among the older population.

Alcohol consumption since 1986 was calculated from the reports of the Revenue Commissioners (Revenue Commissioners, 2010, and earlier years). For the years before 1985 data from Walsh (1987) were used. It should be borne in mind that these figures do not include cross-border alcohol purchases, smuggled quantities, or the consumption of alcohol by Irish tourists abroad, but they do include consumption by tourists visiting Ireland. As there are no continuous time series for alcohol consumption by age and sex, the series used throughout is average consumption per person aged 15 and over.

The data are presented in an Appendix.

A visual inspection of the time series shows that the unemployment rate is cyclical and that its movements do not coincide closely with those in the strongly-trended suicide rates. The first jump in the male suicide rate began before the sharp rise in the unemployment rate during the recession of 1973-4 and it continued as the unemployment rate fell back later in the 1970s.

[8]These are available from the Central Statistics Office's Main Data Dissemination Services.

The second jump occurred as unemployment fell rapidly in the second half of the 1990s and early twenty- first century. The suicide rate peaked in the early years of the "Celtic Tiger" era and declined only slowly thereafter even though the unemployment rate remained at historically low levels. With the onset of recession in 2007, both unemployment and suicide rates have risen sharply. This would suggest that while unemployment may account for some of the cyclical fluctuations, it does not account for the long-term trends observed in the suicide rate among young males.

Alcohol consumption, on the other hand, displayed a strong upward trend from the late 1960s to the end of the century, punctuated by only brief downturns. Consumption peaked in 2001, at 14.3 litres per adult, more than double the level recorded in the late 1960s. There has been a sustained decline in consumption since the turn of the century, the first recorded in over forty years.[9] Figure 3 highlights the similarity of the trends in alcohol consumption and the suicide rate in the demographic group with the highest rate - males aged 25-34.

III MODELLING THE IRISH SUICIDE RATE

The list of variables that have been included in empirical studies of suicide rates is long. For example, Rodríguez Andrés (2005) included real GDP and its growth rate, a measure of income inequality (the Gini coefficient), the unemployment rate, the total fertility rate, female labour force participation, alcohol consumption, and the divorce rate in a panel study of suicide rates in 15 European countries between 1970 and 1998. In addition to some of these variables, Lucey *et al* (2005) in their study of the Irish suicide rate include the marriage rate, the indictable crime rate, and the proportion of births outside marriage. The justification for including many of these variables in a model of suicide is *ad hoc* and there are no *a priori* expectations regarding their effects. Moreover, many of them – the Gini coefficient, the fertility rate, the divorce rate, the marriage rate, and labour force participation rates, for example - move only slowly over time and this lack of variation, together with the presence of common long-run trends, increases the problem of multicollinearity. This makes it difficult to establish the separate effects of individual variables in a relatively short time series for one country, a problem that may be partially overcome by exploiting inter-country or inter-state variation in a panel study.

Taking a different approach, economists have used a Becker-type theoretical framework to analyse the effects of the allocation of time within households on suicide rates among young people. Cutler *et al* (2000) posit that the growing proportion of the young population living

[9]It is beyond the scope of the present paper to explore the reasons for the fall in alcohol consumption, but this development it is obviously of great relevance to mental health issues.

with a lone parent has contributed to the rise of adolescent suicide rates, but Mathur and Freedman (2002) conclude that the favourable effect of the higher incomes that follow from increased labour force participation more than offsets the negative effect of lost parental time.

In the present study we have concentrated on exploring the influence of unemployment and alcohol on suicide because these are the two socioeconomic variables that have the strongest theoretical support for inclusion in a model of suicide and have received the most widespread attention in ecological studies.

When modelling the relationship between the suicide rate, unemployment, and alcohol consumption, account should be taken of the fact that many of these time series display unit root non-stationarity. This is the case with the suicide rates and the unemployment rates in the key younger age groups and the level of alcohol consumption. This implies that the series have "long memories", so that the effects of shocks persist. As a result two unrelated series subject to similar shocks could be significantly correlated but the correlation would be spurious. As a general rule, non-stationary variables should not be included in time series regressions. However, an exception to this rule of thumb is where there is a cointegrating relationship between a linear combination of the variables. On the basis of tests on the residuals of the equation in levels, the hypothesis of a cointegrating relationship between the variables in this study was accepted for the main age groups, supporting the belief that the regression results are not spurious.[10]

Our approach was to estimate a relationship between the variables in levels and where the Durbin-Watson statistic indicated that the residuals were autocorrelated to estimate an AR(1) model. In those cases where an AR(1) was estimated, an error correction model (ECM) was also estimated, which allowed us to explore the short-run dynamics of the adjustment to the long-run relationship between the variables.[11]

All the equations were estimated in a double-log specification. The coefficients may be interpreted as elasticities, that is they show the percentage response of the dependent variable to a percent change in the explanatory variable.

We have taken account of the possibility that structural breaks have occurred in the relationship between the socioeconomic variables and the suicide rate. It could be argued that "the past is a different country" and that the Irish suicide mortality in the 1960s and even in the

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[10]The test for cointegration applied was a simple Dickey-Fuller test for the significance of the coefficient β in the regression $\Delta u_t = \alpha + \beta u_{t-1}$, where u is the residual $(Y - \hat{Y})$ from the original equation. In all cases, highly significant negative estimates of β were obtained.

[11]Lucey *et al* (2005) used the first differences of the variables in their final estimated model on the grounds that it was inappropriate to work with trended variables. This precluded any exploration of the long-run relationships between the variables.

1970s was influenced by different factors that those that came into play in the 1980s and during the "Celtic Tiger" era. This consideration is reinforced by the classification issues discussed earlier– the introduction of a new cause of death (UD) in 1968 - and the non-availability of age-specific unemployment rates before 1988. We tested for the stability of our models between the two sub-periods 1968-87 and 1988-2009. Table 1 takes account of this split and provides summary statistics for the variables for both sub-periods.

IV RESULTS

Table 2 displays the results of testing the basic model for age- and sex-specific suicide rates over the period 1968-2009. The unemployment rates used are sex- but not age-specific. In four of the eight equations for males the autoregressive parameter, ρ, was significant and results of an AR(1) model are shown, in the remaining four equations ρ not significant and the OLS model is reported. (With annual data, longer lags structures were not indicated.) For females, three AR(1) and five OLS models are reported. Diagnostic tests did not reveal problems with heteroscedasticy or inappropriate functional forms. The fairly high negative correlation between alcohol and unemployment was not severe enough to undermine the estimates of their individual effects.

Our model explains male suicide rates better than female rates and rates in the younger age groups better than those in the older age groups. For males, the goodness of fit is very high in the age groups from 15-24 to 55-64 but is not significant for the two oldest groups. The coefficient on the unemployment rate is positive and significant at the conventional levels in the age groups 25-34, 35-44, and 55-64. The coefficient on alcohol consumption is significant at all ages between 15 and 64. For females, a close fit was obtained only for the 15-24 age group. The effects of both unemployment and alcohol consumption are much smaller and also less precisely estimated than is the case for males. Unemployment is generally not a significant influence on the female suicide rate, with the anomalous exception of the 65-74 age group, where it just reaches significance at the 0.05 level. Alcohol consumption is highly significant in the female age groups 15-24 and 25-34, but only in the first of these is its effect comparable to that estimated for males. At age 35 and over the behaviour of the female suicide rate is largely unexplained by our model.

The effect of the unemployment rate on male suicides is highest in the 25-34 and the 45-54 age groups. The effect of alcohol consumption, on the other hand, falls steadily from the level recorded for the 15-24 age group to less than 30 per cent of this value for the 55-64 age group. The elasticities estimated for females are generally much lower than the corresponding male ones and fewer are statistically significant. We return to a discussion of the magnitude of these estimates below.

For reasons discussed above, we favour the use of the suicide rate inclusive of UDs. However, the equations reported in Table 2 were also run with the suicide rate excluding UDs as the dependent variable. The results were generally similar to those obtained for the suicide rate including UDs, but the estimated elasticities and levels of significance were higher, especially among women and in the older age groups. These strong results are likely to be at least in part spurious, induced by the switching between the Suicide and UD classifications. Some of the rapid increase in the narrower measure of the suicide rate between 1968 and 1990s reflects the switching from the UD to the Suicide classification. This leads to spuriously high correlations with the level of alcohol consumption and the unemployment rate, which rose over these years. On the other hand, the narrowly-defined suicide rate fell by 30 per cent between 2001 and 2008 but the UD rate more than doubled. This switch back from "Suicides" to "UDs" exaggerated the correlation with the falling level of alcohol consumption and the low level of unemployment in these years.

In those cases in Table 2 where an AR(1) model was estimated because of significant autocorrelation in the OLS results, and where there was a significant relationship between suicide, alcohol, and unemployment, an error correction model (ECM) was estimated to explore the dynamics of the adjustment to equilibrium.[12] The results are presented in Table 3. We show the value of the *F* test for the significance of the relationship in levels. For the first two age groups the *F* values are highly significant and the ECM may be deemed very satisfactory, for the 55-64 age group it is inconclusive and the ECM is less satisfactory. The estimates of the long-run responses obtained from the ECM are generally lower than those derived from the results in Table 2, but the same broad conclusions about the role of unemployment and alcohol hold. The coefficient of U_{t-1} estimates how quickly the gap between the equilibrium and actual values of the dependent variable is closed. The large negative values shown in the table indicate that positive (negative) deviations from the long-run equilibrium level of the suicide rate in one period tend to cause it to fall (rise) by a large fraction of this deviation in the next. This is of interest in the present situation because in all of these demographic groups the residual from the equilibrium value for 2009 was positive and in some cases by a quite large margin. This suggests that the suicide rates may have "over-adjusted" to the sudden rise in unemployment rates in 2009 and will fall back to a lower long-term level in 2010 as the unemployment rate stabilizes.

[12]The ECM was estimated as the second stage of an Autoregressive Distributed Lag (ARDL) model, choosing the lag structure on the Schwarz Bayesian criterion.

These results refer to the full 1968-2009 period. We tested for the existence of a structural break by estimating a Chow test for the stability of the regression coefficients over the two sub-periods before and after 1988. This test rejected the hypothesis of stability for the younger male age groups (15-24, 25-34, and 35-44) and for females in the middle age groups (35-44, 45-44, and 45-55). An examination of the results for the two sub-periods reveals that the estimated coefficients on the unemployment rate were generally higher pre-1988 than in later years, while the reverse was the case for the alcohol variable.

In view of this evidence of instability in the regression coefficients we re-estimated the model for the period 1988-2009, which allowed us to take advantage of the age-specific unemployment rates calculated for this period. We also took the opportunity to explore the possibility that the *employment* rate (that is, the proportion of the population in a demographic group that is employed) might perform better than the unemployment rate in our model.[13] The results are presented in Table 4. As may be seen from the reported values of the Durbin-Watson statistic, there was no evidence of autocorrelation in the residuals of any of the OLS equations so autoregressive models were not estimated.

The substitution of the employment rate for the unemployment rate does not alter our findings materially. There is a tendency for the use of the employment rate to shift some of the explanation for the rise in suicides among young males from alcohol consumption to labour market conditions, but on goodness-of-fit criteria there are no grounds for preferring these results. Among females the two components of the employment rate (the labour force participation rate and the unemployment rate) could have offsetting effects on suicide. For this reason, we experimented with including the labour force participation rate and the unemployment rate separately in an extension of the model for females. No significant results were obtained for the labour force participation rate.

For males, the results in Table 4 are broadly similar to those recorded in Table 2 but in view of the evidence of a structural break in the sample they should be regarded as providing estimates of the unemployment and alcohol elasticities that are most relevant for recent years. The age-specific rates also provide more reliable estimates of the impact of unemployment in the 15-24 and 25-34 age groups. The responsiveness to changes in alcohol consumption is very high. For example, the elasticities estimated for the younger age groups imply that the 40 per

[13]The reasoning is that the employment rate captures variations in various forms of disguised unemployment, such as the number of discouraged workers, better than the unemployment rate.

cent increase in alcohol consumption recorded between the late 1980s and the early twenty first century would have more than doubled the suicide rate in the 15-24 and 25-34 age groups *ceteris paribus*. This impact was partially offset by the decline in unemployment over these years. The unemployment elasticities imply that the recent trebling of unemployment rates among young males would have raised the suicide rate for males aged 15-24 and 25-34 by about 160 per cent *ceteris paribus*. The actual increase has been much smaller, due in part to the continuing fall in alcohol consumption, which on its own would have led to a reduction of over 70 per cent in these suicide rates. The tug of war between rising unemployment rates and falling alcohol consumption has resulted in fairly modest increases in the suicide rate in recent years. This contrasts with the very rapid increase recorded during the in the first half of the 1990s when alcohol consumption was growing fast and the unemployment rate also increased.

The results for females in Table 4 are generally weaker than those reported in Table 2, regardless of whether the unemployment or the employment rate is used. The alcohol variable is not statistically significant for females in the 15-24 and 25-34 age groups over the 1988-2009 period, where it was highly significant over the 1968-2009 period. Unemployment is not significant in any age group. However, the overall fit of the equation for females aged 15-24 in Table 4 is significant ($F(2,19) = 6.7$, $p = 0.006$) even though neither the unemployment rate nor alcohol consumption is significant. This outcome reflects a high level of collinearity between the two right-hand-side variables relative to their overall correlation with the dependent variable. When the alcohol variable is included on its own it is statistically significant and the significance of the equation increases ($F(1,20)=13.9$, $p = 0.001$). The estimated elasticity for the 1988-2009 period is 1.7, which is within a standard deviation of estimate of 2.2 obtained for the whole period. There is thus some, albeit inconclusive, evidence that alcohol consumption has played a role in the rise in the suicide rate in this group after 1988 as well as over the earlier period.

We conclude that the regression results confirm the impression conveyed by an inspection of the data that the combination of high or rising unemployment and increasing alcohol consumption was an important factor beyond the rapid increase in the male suicide rate in the 1970s and again in the 1990s. The fall in rates in the early twenty first century is understandable in terms of the low unemployment rate and the decline in alcohol consumption. The return to a rising trend in suicides since 2007 may be attributed to the sudden surge in the unemployment rate, which has been especially steep among males, but the continuing decline in alcohol consumption has dampened the rate of increase. Finally, the strong association between aggregate alcohol consumption and suicide among younger males supports the Lederman

hypothesis that changes in average consumption are linked to changes in the incidence of harmful consumption.

The question of the direction of causality needs to be considered. While suicidal tendencies might reduce a person's employability, it is much more plausible *a priori* that the relationship found between suicide and unemployment over time reflects causality running from unemployment to suicide rather than in the reverse direction. Similarly, while in the short run suicidal tendencies may prompt heavy drinking, it is implausible to suggest that variation in these tendencies was behind the major changes in alcohol consumption that have been observed in Ireland over the past four decades. The belief that alcohol is in fact a causal factor in suicide mortality is reinforced by the evidence that in the early years of this century, when the unemployment was stable at a low level, the turning point in alcohol consumption coincided with a turning point in the suicide rate, especially among younger males.

While our results are strong for young males, where suicide rates are highest and have grown fastest, they do not account for much of the observed variation in other demographic groups, notably women of most ages and the older population of both sexes. There is much scope for further research on the factors that might account for the variation in suicide rates in these demographic groups. Our study has also highlighted the volatility of the classification of deaths between "Suicides" and "UDs" and the need for further research on this issue. The recent increase in the number of "accidents" by poisoning also merits further attention.

V CONCLUSION

The Irish time series data for the period 1968–2009 support the hypotheses that rising unemployment and higher levels of alcohol consumption lead to increased suicide mortality. The level of alcohol consumption is a highly significant influence on suicide among men in all age groups between 15 and 54 years, while unemployment is a large and significant influence in the age groups 25-34, 35-44 and 55-64. For females, there is some evidence that alcohol consumption is a significant influence on suicides among females aged under 35 and the influence of the unemployment rate is generally not significant. The long-run influence of alcohol consumption on the male suicide rate has been much larger than that of the unemployment rate. In particular, the sharp increase in the suicide rate during the 1990s was associated with a rapid rise in alcohol consumption at a time when unemployment still high. These findings imply that the suicide rate would have climbed higher in the current recession had the level of alcohol consumption not peaked before the unemployment rate soared. If alcohol consumption continues to decline the impact of the current recession on the suicide rate may be smaller than many commentators fear.

The challenge for suicide prevention policies is to reach at-risk groups with effective interventions. Suicide is a rare event even in the high risk groups. For example in the highest risk group – young unemployed males – the suicide rate is no higher than 125/100,000 or 1 in 800. Similarly, although heavy drinkers as a whole have a high relative risk of suicide, only a small minority of them are actually suicidal. Among these groups effective preventive measures would also have to identify those with severe depressive illness, for example, and even then the identification of individuals at particular risk would remain difficult. This leads to a pessimistic view about the possibility of effective preventive measures at the individual level and might be used to support the case for broad-based public health measures such as measures to discourage alcohol consumption.

The topic of the affordability of alcoholic beverages and the effectiveness of various control policies in reducing alcohol-related harm was recently reviewed extensively on behalf of the European Union (Rabinovich, 2009). Their conclusion is worth quoting:

> If, as this study indicates, the affordability of alcohol *does* impact on levels of harmful and hazardous alcohol consumption, then it makes sense for policymakers to consider the appropriate policy levers available (in this case, measures affecting the price of alcohol, and therefore its affordability) to help curb this phenomenon. (p. 126)

Increased taxation of alcoholic beverages is generally regarded as the most effective of the available policies to discourage heavy drinking (Wagenaar *et al,* 2009), but it entails costs to the wider public than have to be weighed against its possible benefits in deterring harmful consumption. Moreover, a recent meta-analysis of the available evidence found that while alcohol prices and taxes are significantly and inversely related to many alcohol-related diseases and causes of death, the data were too sparse to draw a firm conclusion regarding their effect on suicide (Wagenaar *et al*, 2010). However, the close association between the level of alcohol consumption and the suicide rates among young males documented in the present study suggest that a reduction in consumption due to heavier taxation of alcoholic beverages would lead to some reduction in the incidence of suicide. It is therefore anomalous to note that the incidence of tax on beer has declined from about 34 per cent of the final price in 1999 to 29 per cent in 2009. The tax take as a percentage of the final price of spirits has also declined, although less markedly (see Revenue Commissioners, 2009, Tables EX4 to EX8). This relatively lenient tax treatment of alcoholic beverages over the last decade does not reflect the widely-expressed concern about the high suicide rate among young people.

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Figure 1
Suicide mortality
Rates per 100,000 population aged 15 and over

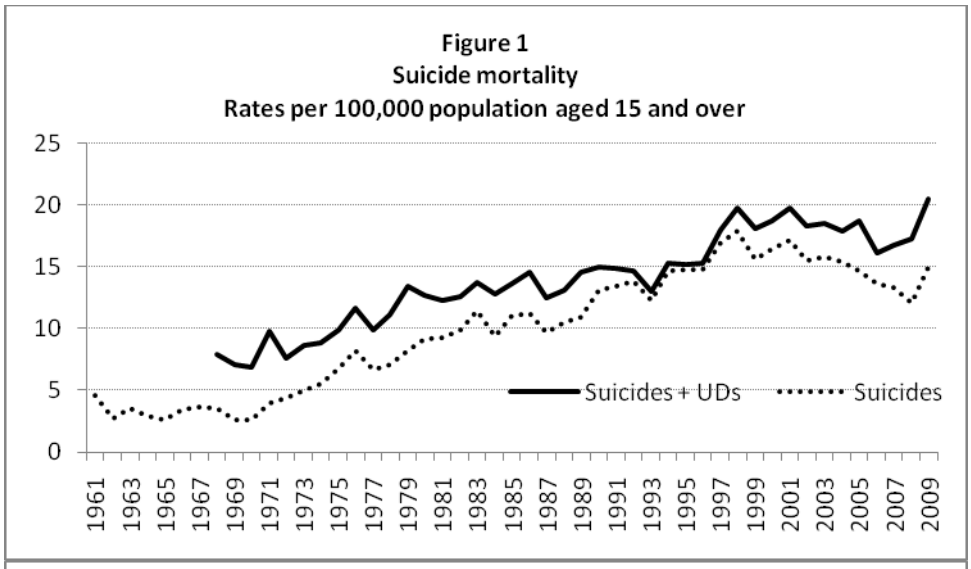

Figure 2
Suicide (incl UD) rates - Males and Females aged 15-24
(three-year moving averages)

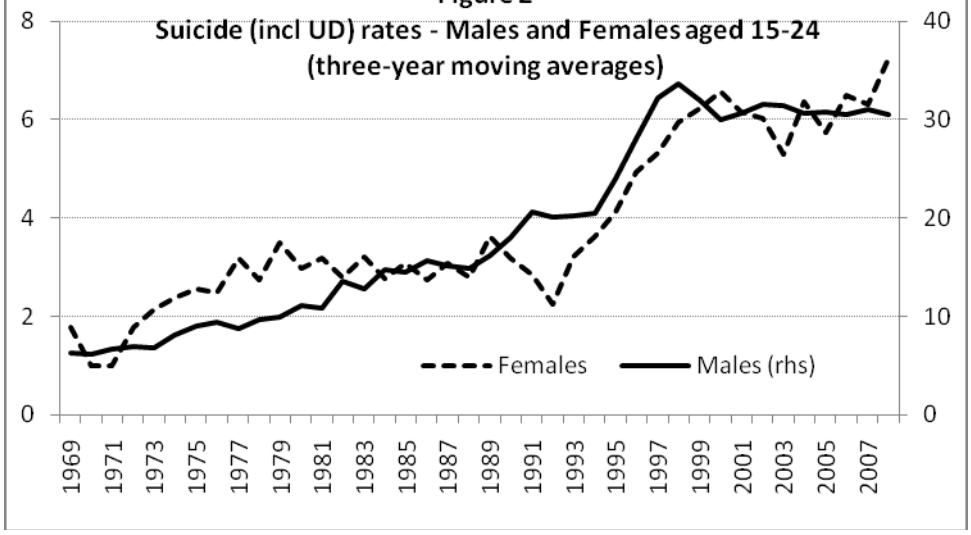

Figure 3
Suicide (incl UD) rate among males aged 25-34
and alcohol consumption
(Three-year moving averages)

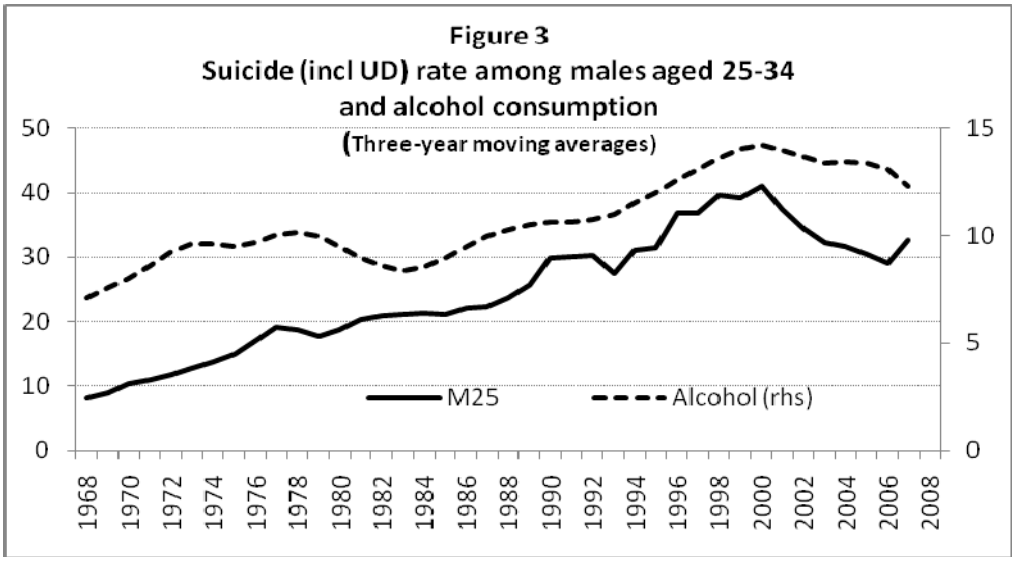

Table 1: *Summary Information on Principal Variables used in Study*

Variable	Mean		Standard deviation	
Suicide (inc UD) Rate / 1000,000 population	1968-1987	1988-2009	1968-1987	1988-2009
Males				
15-24	10.1	26.8	3.8	6.5
25-34	15.8	32.3	5.0	6.0
35-44	16.5	28.0	4.5	6.0
45-54	17.4	25.8	5.4	5.4
55-64	21.2	25.7	5.9	4.0
65-74	18.6	18.6	7.6	4.6
75 +	11.8	13.8	5.0	5.1
Females				
15-24	2.5	5.1	1.1	2.0
25-34	5.0	6.0	1.9	1.5
35-44	7.2	7.2	2.2	1.7
45-54	9.3	9.3	2.7	1.6
55-64	10.8	9.0	3.7	1.9
65-74	7.2	6.9	2.7	4.1
75 +	3.4	4.4	2.7	1.7
Unemployment rate (%)				
Males				
All ages	9.0	9.5	4.0	4.6
15-24		16.4		7.7
25-34		9.8		4.9
35-44		8.1		3.4
45-54		8.5		3.5
55-64		5.7		2.8
Females				
All ages	9.0	9.1	4.0	5.1
15-24		13.5		5.8
25-34		8.0		4.3
35-44		8.8		5.9
45-54		7.5		4.7
55-64		4.9		3.2
Alcohol consumption (litres / person aged 15 and over)	8.9	12.3	1.0	1.5

Note: Age-specific unemployment rates not available before 1988.

Table 2: *Regression Results, 1968-2009*
Dependent variable = Ln Suicide Rate

(t-ratios)

Demographic group: Males aged:	Intercept	Ln Male Unemployment Rate	Ln Alcohol Consumption	ρ (AR1) /OLS	$\bar{R}^2$	Durbin-Watson Statistic
15-24	-3.495 (3.7)***	0.270 (1.9)	2.433 (6.9)***	0.417 (3.0)**	0.79	2.2
25-34	-2.641 (4.7)***	0.363 (4.2)***	2.120 (10.2)***	0.341 (2.3)*	0.85	1.95
35-44	-0.922 (1.7)	0.177 (2.1)*	1.532 (7.8)***	OLS	0.61	1.85
45-54	-0.461 (0.9)	0.109 (1.4)	1.387 (7.7)***	OLS	0.59	1.70
55-64	1.258 (2.0)	0.243 (2.6)*	0.580 (2.4)*	0.533 (4.1)***	0.56	2.1
65-74	2.025 (2.7)*	0.185 (1.6)	0.192 (0.7)	OLS	0.00	1.8
75 and over	0.600 (0.7)	0.178 (1.3)	0.638 (2.0)*	OLS	0.06	2.3

*p < .05 **p < .01 ***p <.001

AR(1) Exact Maximum Likelihood Model

Unemployment rate per cent
Suicide rate per 100,000 relevant population
Alcohol consumption per person aged 15 and over

Table 2 (continued): *Regression Results, 1968-2009*
Dependent variable = Ln Suicide (incl UD) Rate

(t-ratios)

Demographic group: Females aged:	Intercept	Ln Female Unemployment Rate	Ln Alcohol Consumption	ρ (AR1) /OLS	$\bar{R}^2$	Durbin-Watson Statistic
15-24	-4.138 (4.2)***	0.040 (0.3)	2.237 (6.2)***	OLS	0.50	1.88
25-34	-0.289 (0.4)	0.037 (0.3)	0.797 (2.9)**	OLS	0.14	2.45
35-44	0.719 (0.8)	0.015 (0.1)	0.501 (1.5)	0.412 (2.9)*	0.17	1.90
45-54	1.006 (1.8)	0.078 (1.0)	0.440 (2.2)*	OLS	0.06	1.71
55-64	1.905 (1.9)	0.112 (0.4)	0.041 (0.1)	0.356 (2.5)*	0.10	2.13
65-74	0.46 (0.3)	0.435 (2.1)*	0.180 (0.3)	OLS	0.06	1.95
75 and over	-1.24 (1.0)	-0.057 (0.3)	1.091 (2.4)*	OLS	0.11	1.87

*p < .05 **p < .01 ***p <.001

AR(1) Exact Maximum Likelihood Model

Unemployment rate per cent
Suicide (incl UDs) rate per 100,000 relevant population
Alcohol consumption per person aged 15 and over

Table 3: *Error Correction Representation*

LSR = ln Suicide (incl UD) rate
LUR = ln Unemployment rate
LAL = ln Alcohol consumption
U = residual from long-run relationship

(t-ratios)

Demographic group:			$\bar{R}^2$	Durbin-Watson Statistic
Males 15-24	Long-run relationship:	LSR = – 5.017 + 0.405 LUR + 2.966 LAL		
	ECM:	Δ LSR = 0.265 Δ LUR + 0.169 Δ LAL - 0.652 ΔU_{t-1} (2.9)** (0.2) (5.0)***	0.36	2.1
	F-statistic for existence of a relationship in levels = 8.4, 95% upper bound = 5.2			
Males 25-34	Long-run relationship:	LSR = – 3.428 + 0.451 LUR + 2.378 LAL		
	ECM:	Δ LSR = 0.283 Δ LUR + 1.493 Δ LAL - 0.628 ΔU_{t-} (3.7)*** (4.4)*** (4.8)***	0.34	2.2
	F-statistic for existence of a relationship in levels = 7.94, 95% upper bound = 5.2			
Males 55-64	Long-run relationship:	LSR = 1.302 + 0.261 LUR + 0.555 LAL		
	ECM:	Δ LSR = 0.114 Δ LUR + 0.243 Δ LAL - 0.437ΔU_{t-1} (1.7) (1.4) (3.2)**	0.16	2.1
	F-statistic for existence of a relationship in levels = 3.3343, 90% upper bound = 4.34, 90% lower bound = 3.3341			

*p < .05 **p < .01 ***p <.001

Unemployment rate per cent
Suicide (incl UD) rate per 100,000 relevant population
Alcohol consumption per person aged 15 and over

Table 4: *OLS Results 1988-2009*
Dependent variable = Ln Suicide (incl UD) Rate
Age-specific unemployment and employment rates

(t-ratios)

Demographic group:	Intercept	Ln Unemployment Rate	Ln Employment Rate	Ln Alcohol Consumption	$\bar{R}^2$	Durbin-Watson Statistic
Males 15-24	-8.095 (4.2)***	0.539 (3.6)***		3.963 (6.3)***	0.79	1.98
	-0.436 (0.8)		-0.843 (2.4)*	2.758 (6.2)***	0.73	1.70
Males 25-34	-5.211 (2.5)*	0.477 (3.0)**		3.060 (4.3)***	0.56	1.86
	11.826 (3.3)		-3.286 (3.1)**	2.482 (4.7)***	0.54	1.90
Males 35-44	-2.621 (1.5)	0.398 (2.0)		2.051 (3.5)**	0.35	2.23
	12.5 ((2.4)		-3.528 (2.3)*	2.577 (3.6)**	0.39	2.35
Males 45-54	--1.193 (0.5)	0.123 (0.6)		1.667 (2.3)*	0.38	1.99
	3.43 (0.6)		-0.936 (0.6)	1.56 (2.5)*	0.37	1.96
Males 55-64	-3.450 (1.5)	-0.010 (0.1)		-0.080 (0.1)	0.0	1.31
	-5.543 (2.4)		0.411 (0.5)	-0.161 (0.4)	0.1	1.3

*p < .05 **p < .01 ***p <.001

Unemployment rate per cent
Employment rate per cent
Suicide (incl UD) rate per 100,000 relevant population
Alcohol consumption per person aged 15 and over

Table 4 continued: *OLS Results 1988-2009*
Dependent variable = Ln Suicide (incl UD) Rate
Age-specific unemployment and employment rates

(t-ratios)

Demographic group:	Intercept	Ln Unemployment Rate	Ln Employment Rate	Ln Alcohol Consumption	$\bar{R}^2$	Durbin-Watson Statistic
Females 15-24	-2.245 (0.4)	-0.206 (0.4)		1.723 (0.9)	0.35	1.76
	-5.543 (2.4)		0.594 (0.6)	1.856 (1.8)	0.36	1.8
Females 25-34	5.024 (1.2)	-0.317 (1.1)		-1.058 (0.8)	0.0	2.5
	-0.49 (0.0)		0.707 (0.8)	-0.454 (0.4)	0.0	2.5
Females 35-44	4.453 (1.2)	-0.272 (1.3)		-0.791 (0.6)	0.09	1.6
	0.210 (0.2)		0.054 (0.1)	0.610 (0.6)	0.1	1.7
Females 45-54	2.027 (1.0)	-0.093 (0.8)		0.142 (0.2)	0.17	2.2
	0.813 (0.9)		0.077 (0.4)	0.445 (0.8)	0.1	2.1
Females 55-64	6.861 (2.7)	-0293 (1.8)		-1.719 (1.8)	0.06	2.1
	2.787 (2.4)		0.142 (0.6)	-0.429 (0.7)	0.0	1.9

*p < .05 **p < .01 ***p <.001

Unemployment rate per cent
Employment rate per cent
Suicide (incl UD) rate per 100,000 relevant population
Alcohol consumption per person aged 15 and over

Data Appendix

	Suicide (excl UD) rate per 100,000 population 15+	Suicide (incl UD) rate per 100,000 population 15+	Alcohol consumption per adult	Unemployment rate, males	Unemployment rate, females
1968	3.5	7.9	6.62	5.1	5.1
1969	2.6	7.1	7.17	5.4	5.4
1970	2.6	6.9	7.52	5.0	5.0
1971	4.0	9.8	7.98	5.9	5.9
1972	4.3	7.6	8.48	6.9	6.9
1973	5.0	8.7	9.31	6.2	6.2
1974	5.5	8.9	9.92	5.7	5.7
1975	6.7	9.8	9.59	5.4	5.4
1976	8.2	11.6	9.37	9.3	9.3
1977	6.7	9.9	9.52	9.1	9.1
1978	7.1	11.2	10.10	8.8	8.8
1979	8.3	13.4	10.40	8.3	8.3
1980	9.1	12.7	9.95	6.8	6.8
1981	9.3	12.3	9.50	7.4	7.4
1982	9.9	12.7	9.10	10.5	10.5
1983	11.5	13.7	8.24	11.6	11.6
1984	9.3	12.8	8.39	14.0	14.0
1985	11.0	13.6	8.40	15.6	15.6
1986	11.2	14.5	8.80	16.7	16.7
1987	9.7	12.5	9.73	17.1	17.1
1988	10.5	13.2	9.89	15.9	17.2
1989	11.0	14.6	10.26	14.9	15.4
1990	13.1	15.0	10.67	12.5	13.8
1991	13.4	14.9	10.58	14.2	15.5
1992	13.8	14.7	10.69	15.0	15.2
1993	12.3	13.0	10.53	15.6	15.8
1994	14.7	15.3	11.07	14.7	14.8
1995	14.8	15.2	11.39	12.1	12.2
1996	14.8	15.3	12.14	11.9	11.9
1997	17.0	18.0	12.53	10.4	10.3
1998	17.9	19.8	13.06	7.5	7.1
1999	15.6	18.1	13.72	5.6	5.4
2000	16.4	18.7	14.09	4.3	4.1
2001	17.2	19.8	14.30	4.1	3.8
2002	15.5	18.3	14.22	4.7	4.1
2003	15.8	18.6	13.35	4.9	4.1
2004	15.4	17.9	13.48	4.8	4.0
2005	14.7	18.7	13.38	4.6	4.1
2006	13.7	16.2	13.37	4.6	4.2
2007	13.3	16.8	13.37	4.9	4.1
2008	12.1	17.2	12.42	7.4	4.9
2009	15.0	20.5	11.17	14.8	8.1

Male suicide (incl UD) rates by age (per 100,000 population)

	M1524	M2534	M3544	M4554	M5564	M6574	M75	MTOTAL
1968	8.1	9.7	14.2	10.4	14.9	16.4	9.6	11.5
1969	4.2	7.6	9.8	9.2	15.5	19.4	5.8	9.6
1970	6.6	7.5	13.1	8.7	18.7	13.2	11.5	10.7
1971	7.7	11.6	19.1	18.2	18.4	13.1	7.8	13.7
1972	5.5	12.2	9.1	18.2	13.7	9.0	7.8	10.7
1973	7.7	8.8	14.0	15.2	15.7	14.7	17.4	12.2
1974	7.2	14.3	13.1	15.8	15.8	12.6	13.5	12.6
1975	9.6	15.1	14.1	14.6	18.5	11.4	3.8	13.1
1976	10.4	12.1	19.3	17.9	20.6	26.3	25.0	16.6
1977	8.1	17.6	9.5	13.5	17.2	12.1	13.4	12.7
1978	7.9	21.4	15.8	14.3	22.2	7.3	17.3	14.8
1979	13.1	18.4	19.6	19.6	21.5	36.1	15.4	19.3
1980	8.9	16.4	20.1	28.7	21.1	19.7	5.7	17.1
1981	11.4	18.5	20.0	26.1	20.5	14.2	13.3	17.5
1982	12.3	21.2	25.1	18.1	21.3	19.5	16.8	18.8
1983	17.0	21.0	16.7	23.1	26.3	27.4	9.2	20.2
1984	9.2	20.4	16.2	17.8	25.7	21.2	10.8	16.8
1985	17.8	21.9	17.2	14.6	36.6	30.2	8.9	21.0
1986	16.2	21.5	22.9	25.9	30.5	25.0	12.3	21.9
1987	12.8	20.0	21.3	18.1	29.3	24.3	10.3	19.1
1988	16.5	24.9	12.9	13.6	30.8	18.9	29.8	19.5
1989	15.5	22.1	24.9	26.8	24.3	26.1	19.5	22.1
1990	16.5	24.2	22.4	27.3	32.4	15.8	8.8	21.3
1991	22.1	30.8	30.1	18.8	27.7	15.8	9.6	23.7
1992	23.3	34.9	18.3	23.6	25.2	22.1	11.4	23.7
1993	14.9	24.6	26.1	15.8	24.9	18.1	7.5	19.5
1994	22.6	31.3	22.5	24.9	21.8	13.3	12.2	22.8
1995	23.8	26.5	30.5	20.3	16.7	19.6	14.1	23.1
1996	25.7	35.4	30.5	21.1	21.8	10.1	14.1	24.9
1997	34.8	32.5	34.1	25.0	25.4	11.4	11.2	28.0
1998	36.0	42.5	34.2	32.4	22.2	19.5	14.0	31.8
1999	30.2	35.7	24.7	26.8	31.1	17.0	11.2	27.3
2000	29.7	40.6	32.1	29.9	27.6	14.5	6.5	28.9
2001	30.2	41.3	35.4	33.6	28.8	23.5	15.5	25.3
2002	31.9	41.2	26.8	26.5	25.4	24.8	12.5	29.8
2003	32.5	30.0	34.9	25.7	26.9	12.6	20.5	28.6
2004	29.9	32.0	32.9	31.6	27.6	18.9	16.0	29.4
2005	29.7	34.7	29.5	33.2	26.6	18.4	9.3	29.1
2006	32.7	28.1	26.5	26.4	23.1	18.3	17.7	26.6
2007	29.3	28.7	24.8	25.4	21.3	25.0	13.6	25.7
2008	31.3	30.7	24.6	26.8	21.6	21.4	15.6	26.4

2009	31.0	38.7	37.5	31.2	31.9	24.3	12.7	32.7
	Female suicide (incl UD) rates by age (per 100,000)							
YEAR	F1524	F2534	F3544	F4554	F5564	F6574	F75	FTOTAL
1968	3.6	2.0	3.2	5.0	6.6	4.6	6.0	4.2
1969	0.9	5.9	4.6	7.5	8.0	3.7	1.5	4.6
1970	0.9	2.6	5.9	5.0	4.3	0.9	1.5	3.0
1971	1.3	7.5	5.3	8.8	9.1	6.3	3.0	5.7
1972	0.8	4.8	4.6	7.6	7.7	5.3	1.5	4.5
1973	3.2	2.3	5.2	10.1	4.2	7.9	4.3	5.1
1974	2.4	4.4	6.4	5.1	9.7	6.1	4.2	5.2
1975	1.5	7.8	8.9	8.3	13.0	4.3	2.8	6.5
1976	3.7	3.0	10.0	8.4	11.6	10.2	2.7	6.8
1977	2.2	5.3	10.6	11.7	10.2	10.1	1.3	7.0
1978	3.6	8.3	5.5	10.5	14.3	9.2	2.6	7.5
1979	2.5	6.2	7.3	11.3	11.5	9.1	11.7	7.4
1980	4.5	7.8	7.7	10.7	12.9	9.8	5.1	8.0
1981	2.0	5.5	10.9	14.8	12.9	4.8	1.3	7.1
1982	3.0	2.9	8.8	8.0	14.2	7.9	6.2	6.5
1983	3.3	6.2	7.9	10.0	19.7	7.1	2.4	7.7
1984	3.3	4.1	10.2	11.2	12.9	8.6	1.2	7.0
1985	1.6	5.6	7.9	9.9	9.6	10.9	1.2	6.2
1986	4.3	4.4	6.3	13.9	13.1	10.1	1.1	7.2
1987	2.3	4.4	6.5	8.5	9.8	7.8	6.7	5.8
1988	2.7	5.6	8.7	10.9	12.0	8.5	3.3	6.9
1989	3.4	4.0	6.7	7.6	11.4	15.4	9.5	7.1
1990	4.8	8.8	7.9	9.2	10.7	7.0	5.1	7.5
1991	1.4	6.0	5.2	8.9	7.9	6.9	4.0	5.3
1992	2.4	4.7	3.0	5.1	9.3	7.7	4.0	4.6
1993	3.0	5.1	6.3	7.7	7.8	3.8	3.9	5.3
1994	4.3	3.5	7.0	11.1	8.4	13.0	2.9	6.7
1995	3.6	7.7	7.8	9.2	7.6	2.3	2.8	6.1
1996	4.5	5.7	5.2	6.9	4.8	0.8	1.9	4.7
1997	6.7	4.9	6.6	9.5	6.8	12.5	2.7	7.0
1998	4.8	5.5	9.6	9.2	9.2	3.9	3.6	6.7
1999	6.3	6.5	7.5	10.3	11.5	7.9	5.3	5.9
2000	7.6	4.6	9.9	8.7	5.6	10.2	4.4	7.4
2001	5.7	6.1	7.9	11.1	11.9	2.4	2.6	5.7
2002	5.1	8.4	6.7	10.0	8.0	4.7	4.2	7.0
2003	7.3	6.6	9.3	11.5	10.5	8.5	5.8	8.5
2004	3.5	5.8	7.1	11.3	9.1	5.3	3.3	6.6
2005	8.3	8.0	6.6	10.3	10.3	8.2	6.5	8.3
2006	5.4	4.2	5.5	7.3	9.0	3.8	3.2	5.6
2007	5.7	6.7	7.6	11.0	9.2	2.2	7.1	7.2
2008	7.8	5.9	10.2	9.2	9.4	3.6	5.4	7.8
2009	8.2	8.6	6.7	9.0	8.2	14.0	4.3	8.2

Male unemployment rates

	M15	M25	M35	M45	M55
1988	26.0	15.7	9.5	12.1	10.6
1989	22.4	15.1	9.3	12.0	9.8
1990	18.9	12.7	9.1	10.3	8.5
1991	23.4	14.8	9.8	11.1	8.3
1992	24.9	16.0	9.6	11.8	8.4
1993	27.0	16.3	10.5	12.2	8.6
1994	25.4	14.6	9.9	12.0	8.6
1995	20.5	12.3	8.1	10.1	7.5
1996	19.2	11.9	8.1	11.0	6.9
1997	16.9	10.1	7.9	9.4	6.4
1998	11.3	7.0	7.3	8.7	5.1
1999	8.5	5.0	5.3	6.5	3.8
2000	6.5	4.0	4.3	4.9	2.9
2001	7.5	4.0	4.3	3.7	2.7
2002	9.1	5.1	5.6	4.4	2.7
2003	9.4	5.1	5.6	4.9	3.0
2004	9.1	5.0	5.4	4.7	2.8
2005	9.3	4.6	5.2	4.3	3.0
2006	8.9	4.9	5.7	4.6	2.0
2007	9.8	5.3	6.3	4.8	2.6
2008	16.0	8.2	9.7	7.4	3.8
2009	31.1	17.5	20.4	15.2	8.1

Female unemployment rates

	F15	F25	F35	F45	F55
1988	21.5	14.3	19.3	15.2	10.7
1989	18.3	13.9	17.6	13.0	9.4
1990	16.1	13.0	14.9	12.4	8.3
1991	19.7	13.7	16.8	13.1	8.7
1992	21.0	12.8	16.1	11.9	7.7
1993	23.1	13.7	15.0	13.0	7.0
1994	20.8	12.5	14.8	13.1	8.2
1995	17.5	10.1	11.8	10.8	8.5
1996	17.0	9.9	11.9	10.6	6.5
1997	15.2	9.5	9.0	9.4	4.9
1998	10.9	6.0	6.0	6.6	3.2
1999	8.3	4.6	4.6	4.5	2.7
2000	6.8	3.6	3.4	3.2	2.2
2001	6.7	3.3	2.9	2.8	2.0
2002	7.6	3.7	3.1	2.9	1.9
2003	7.8	4.0	3.0	2.8	1.8
2004	8.3	3.4	3.3	2.6	1.7
2005	7.9	3.7	3.3	2.9	2.0
2006	8.2	4.0	3.5	2.8	1.9

007	7.8	3.9	3.6	2.9	1.4
2008	10.3	4.7	3.9	3.2	1.9
2009	17.3	8.1	6.8	5.3	4.2

Data available at:

http://www.cso.ie/px/pxeirestat/Dialog/varval.asp?ma=LFBA2&ti=ILO+Persons+aged+15+years+and+over+(1988-1997)+(Thousand)+by+Age,+Sex,+Year+and+ILO+Economic+Status&path=../Database/Eirestat/Labour%20Force%20Survey%201988%20to%201997/&lang=1