

Discouraged Older Male Workers and the Discouraged Worker Effect

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Abstract

With governments worldwide attempting to increase the labour force participation of older workers in the context of ageing populations, both older workers marginally attached to the labour force (discouraged workers), and those whose labour force participation is affected by cyclical fluctuations (via the discouraged worker effect), are of particular interest to policy makers. Analysis of OECD statistics shows that discouraged older males workers, as collected and published by government statistical agencies, are both relatively low in number and also do not display any strong cyclical pattern. In contrast, results from a panel model of eleven OECD countries' older male labour force participation rates indicate that the econometrically estimated cyclical discouraged worker effect is the dominant influence on participation in recent decades. In comparison, the estimated influence of social security pension value on participation rates is relatively small. Further modelling reveals that the discouraged worker effect is asymmetric in nature, with results showing that the influence from a cyclical downturn in decreasing older male participation rates significantly outweighs the role of economic recovery in encouraging participation. The findings have important implications for policy reforms advocated by the OECD and ILO to increase older worker labour force participation.

JEL classification: J080; J180; J260

1. Introduction

The average age of most developed economies' populations are increasing as a result of declining fertility rates and increased life expectancy (OECD, 2009). While the latter is a positive reflection on better health and standards of living, this demographic phenomenon had been identified by policy makers as placing increasing strain on government budgets over coming decades due to the traditional financing of healthcare and pensions of older age groups by governments (eg. see Leibfritz *et al.*, 1995; and Rosevare *et al.*, 1996). This dilemma has only been exacerbated by declining labour force participation rates of older workers in the 1970s and 1980s, the so called 'early retirement phenomenon'. Therefore, reversing these early retirement

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trends, particularly for older males, has been established as an important policy issue for most developed economies in the face of ageing populations and associated fiscal pressures (OECD, 1995).

Traditionally, policies recommended by the OECD to increase older worker labour force participation have consisted of various social security pension reforms. Namely, restricting or removing social security pensions that allow early exit from the labour force, reducing the implicit tax on continued employment inherent in pensions, and increasing the standard retirement age to 67 years in member countries (Burniaux *et al.*, 2004). More recently, the OECD established a policy review of the barriers to employment faced by older workers (OECD, 2006). However, despite the rhetoric, recommended labour market oriented policies from this policy review are weak in nature and remain secondary to the role of pension reforms (O'Brien, 2011). There is a clear divide with respect to ILO policy relating to older workers. Since 1980 the ILO has called for older workers to be placed within an overall strategy of full employment, age discrimination legislation, and a flexible pensionable age (ILO, 1995, 2003).

It is therefore especially important at this time to understand the factors influencing older worker labour force participation rates. Most past research has focussed on the role of social security for early retirement trends, although disagreement remains as to its relative importance (eg. see Jacobsen, 1999; Duval, 2003; and Blau and Goodstein, 2010). This research generally implies that making pensions less financially attractive will reverse early retirement trends. However, literature addressing the older worker labour market and related factors affecting participation rates is scant in comparison (O'Brien, 2005, 2010). These issues are the focus of this paper, specifically analysing the two concepts of 'discouraged workers' and the 'discouraged worker effect' for older male workers.

A key measure of excess labour supply not reported in official unemployment statistics is 'discouraged workers'. Discouraged workers statistics are generally collected by government statistical agencies within household or labour force surveys, and defined as those who wish to have a job but have given up searching for employment. They comprise a subcategory of those marginally attached to the labour force and represent an important source of potential labour supply that can be drawn back into the labour force, as respondents specifically express a desire for employment. The size of this potential labour supply of older workers and possible factors affecting its size are of particular policy relevance and will be analysed for eleven OECD countries here in econometric models.

In comparison, the 'discouraged worker effect' is the pro-cyclical relationship between labour market conditions and labour force participation rates, generally being estimated in econometric models. Panel models of labour force participation rates for males aged 55-64 years covering the same eleven OECD countries will be estimated in this paper as a function of social security pension and labour market oriented variables. The estimated discouraged worker effect can give policy makers information regarding the potential increase in labour force participation from favourable cyclical conditions and likewise labour supply lost due to recessions. The discouraged worker effect need not be symmetric in nature. That is, an increase in participation rates resulting from a given cyclical upturn may not be the same as the

fall in participation rates from a similarly sized cyclical downturn. This possibility is allowed for in our specification and is a novel feature of the research presented here.

A priori it may be expected that those with marginal attachment to the labour force would constitute a significant group affected by cyclical fluctuations in the labour market. That is, we would expect a close association between the two concepts of discouraged workers and the discouraged worker effect. We analyse both concepts here in detail, specifically applied to older male workers. Findings are therefore expected to have important implications for labour market oriented policies to increase older worker labour force participation in the face of ageing populations in OECD countries.

The remainder of this paper is organised into six sections. The literature surrounding discouraged workers and the discouraged worker effect is introduced in section 2. The methodology employed in this paper to analyse discouraged workers and the discouraged worker effect is presented in section 3, followed by empirical results in sections 4 to 6. A summary of findings and policy implications concludes this research in section 7.

2. Discouraged Workers and the Discouraged Worker Effect

Discouraged Workers

Following ILO standards, to be defined as unemployed and therefore part of the labour force, an individual must be without a job, but available to start work, and actively searching for employment (Hussmans, 2007). However, it has been argued that this definition is overly restrictive and may underestimate the true extent of excess labour supply (Knight, 1987). A group of particular interest are those defined as discouraged workers. Discouraged workers are generally defined as those who want a job and are currently available for work but have given up any active job search because they believe they cannot find a job, although there remain country specific differences in the precise definition (OECD, 1993; and ABS, 2007). They are deemed to have marginal attachment to the labour force and are therefore classified as not in the labour force (NILF) and outside the definition of unemployment. Discouraged worker statistics for the European Union average and OECD average are available from 1983 onward (OECD, 2011), although they have been collected by some countries such as Canada since 1976.

Debate surrounds the usefulness of the presently defined unemployment rate, which of course excludes discouraged workers, for measuring unutilised labour and excess supply (eg. see Murphy and Topel, 1997; and Krugman, 2004). Therefore, alternative measures of unemployment have been estimated by including discouraged workers (Sorrentino, 1993; and Bregger and Haugan, 1995). However, because of their limited attachment to the labour force others argue they should remain excluded from unemployment measurement (eg. see Finegan, 1981; and Flaim, 1984). More recent research using panel data suggests that marginally attached workers are a distinct group, differing from both the unemployed and others not in the labour force in terms of employment transitions (eg. see Gray *et al.*, 2005; Jones and Riddell, 2006; and Breunig and Mercante, 2010).

Outstanding issues also remain unresolved in the empirical literature specifically analysing older male discouraged worker statistics. First, there is

disagreement as to whether older male workers are more likely (eg. see Roseblum, 1974; Rones, 1983; Laczko, 1987; and Kodrycki, 2000) or less likely (OECD, 1993) than other age groups to be discouraged workers. Further disagreement regards whether older discouraged worker statistics are primarily influenced by cyclical (Roseblum, 1974) or structural unemployment influences (Flaim, 1973). It is clear that these unresolved issues have not been revisited for quite some time.

The Discouraged Worker Effect

The essence of the discouraged worker effect is succinctly defined by Johansson (2002):

“According to the discouraged-worker effect, the participation rate will decrease when it is difficult to get a job and increase when it is easy to find a job so that people move in and out of the labor force – depending upon the state of the business cycle”. Johansson, 2002, p6.

The concept is originally attributed to Long (1953), although no strong evidence of a cyclical relationship between US labour force participation rates and the unemployment rate was established in his research. Long (1953) analysed correlation coefficients to investigate the discouraged worker effect, however, subsequent research has attempted to estimate it using econometric techniques. Tella (1964) estimated a significant discouraged worker effect for both males and females in the US using employment to population rates as the explanatory variable. Tella (1965) re-estimated these equations by age group, where the greatest cyclical sensitivity was displayed by females, youth and older workers (over the age of 55 years), with the least sensitivity estimated for prime aged males. Dernburg and Strand (1966) also estimated regressions of labour force participation on employment to population rates for disaggregated sex-age groups. Although the specification was very similar to Tella (1965), except for the inclusion of a variable to capture the added worker effect, the discouraged worker effect for males 55-64 was estimated to be statistically insignificant. Benati (2001) reviewed numerous studies that have since attempted to estimate the discouraged worker effect, both at the aggregate level and for disaggregated sex-age groups. According to this review only half of the studies found evidence of a significant discouraged worker effect.

The explanatory variable used to capture the cyclical influence on labour force participation rates was a disputed issue in the early stages of the literature (Land and Pampel, 1980). The employment to population ratio was used by Tella (1964, 1965) and others in early research, however, this measure was criticised by Mincer (1966) on the grounds that non-cyclical or autonomous factors could affect the relationship between employment and labour force participation rates. Mincer concluded that the discouraged worker effect estimated using the aggregate employment to population rate was biased upward. More recently, Benati (2001) recommended the possible use of three alternative variables to capture the cyclical influence on participation rates, namely, the unemployment rate of prime aged males (25 to 54 years), real GDP, and capacity utilisation in the manufacturing sector. However, the use of the employment to population rate still features prominently in contemporary research.

An issue to emerge in more recent literature exploring the discouraged worker effect is the possible asymmetry of the estimated relationship (eg. see Dixon, 1995; Connolly, 1997; and Lenton, 2001). That is, whether the increase in participation rates from a cyclical upswing is of the same magnitude same as the decrease in participation rates derived from a similarly sized cyclical downswing. The consensus from this research is generally that improvements in labour market conditions have a stronger impact on encouraging participation compared to a cyclical downturn for decreasing participation.

The research in this paper attempts to contribute to the empirical literature on older male worker labour force participation in a number of ways. First, the link between the two concepts of discouraged workers and the discouraged worker effect is explored specifically for older males. The objective is to enrich the knowledge we have regarding the extent of excess older male labour supply and the role of cyclical conditions influencing older male labour force participation. Knowledge regarding this pool of excess labour supply and the role of the business cycle has important implications for policy makers attempting to increase older worker labour force participation in response to ageing populations.

Second, a number of advancements are made upon previous econometric modelling of the discouraged worker effect. Few studies have focussed specifically on estimating the discouraged worker effect for older workers. Studies that have estimated a discouraged worker effect for older males have generally done so as part of more general research that was disaggregated by sex and age. Typically, the effect had been estimated using a simple set of common explanatory variables for all sex-age groups, consisting of a cyclical variable and time trend. This was likely to lead to omitted variable bias in the case of older workers, whose labour force participation rates will also be affected by the financial incentive for participation or labour force exit inherent in social security pensions. In addition, the use of time trends is inappropriate unless there is a theoretical justification or if the variable of interest is trend stationary. The findings from earlier work using this specification must therefore be questioned on the basis of flawed specification and estimation issues.

Therefore, the discouraged worker effect will be included in the present research as one of many influences on older worker participation (eg. see Blondal and Scarpetta, 1998; O'Brien, 2001, 2010; and Duval, 2003). Apart from O'Brien (2010), the time-series properties of included variables have been neglected in previous research. Therefore, all variables will first be analysed using unit root testing before the final specification is chosen. Furthermore, to provide robust results an (unbalanced) panel of eleven OECD countries over 1967 to 2009 is utilised rather than concentrating on one country only. The criterion used for the inclusion of countries in the analysis is data availability, with at least twenty five years of annual data for all variables used as the cut off. The eleven included countries were Australia, Canada, Finland, France, Italy, Germany, Norway, Portugal, Spain, Sweden, and the US.

Finally, the specification allowing an asymmetric discouraged worker effect for older male labour force participation is unique to this study. Previous studies estimating this effect have generally done so at the aggregate level and found a stronger influence from a cyclical upswing encouraging participation in comparison

to a downturn discouraging participation. However, the opposite may be true for older male workers, having a tendency to exit the labour force permanently in recessionary times and being relatively slow to take up employment during expansionary phases.

The research in this paper is therefore timely for a number of reasons. First, there is renewed interest in the influences on older worker labour force participation from policy makers in the context of ageing populations. Second, most prior research on older male workers has focussed on the role of social security pensions, in turn setting the platform for pension reform agenda. The OECD has now acknowledged that barriers to employment is an important issue for increasing older worker labour force participation but has not conducted any substantial accompanying research on this topic (OECD, 2006). Finally, a number of unresolved debates regarding older male discouraged worker statistics and the discouraged worker effect remain from early research, the findings from which may be tainted by the use of inadequate model specifications and outdated techniques.

3. Methodology

First we wish to analyse older male discouraged worker statistics to determine the extent of discouragement and furthermore to test whether there is a cyclical pattern present which may be consistent with a discouraged worker effect. A visual inspection of OECD average older male discouraged worker statistics over time will be followed by a simple regression model:

$$DISC/POP_{it} = f(UNEMPPR_{it}) \quad (1)$$

where $DISC/POP_{it}$ represents the percentage of discouraged males aged 55-64 to their population in country i (1 to 11) and time period t , and $UNEMPPR_{it}$ is the unemployment rate for prime aged (25-54 years) males (representing cyclical conditions). Two models are estimated. Discouraged worker data at the individual country level is very limited, with most countries only publishing this data for males aged 55-64 from the year 2000 onward. Canada and Norway are notable exceptions, publishing this data from 1976 and 1989, respectively. Model 1 presents a fixed effects model using this unbalanced panel of eleven countries. However, an OECD average discouraged worker count for this age group has been published from 1983 onward (OECD, 2011). Therefore, a separate model is estimated at the OECD average country level using this data for comparison purposes.

The remainder of the analysis explores the discouraged worker effect for older males, which is incorporated into a more general model used to explain their labour force participation rates over time. Labour force participation rates for older males aged 55-59 and 60-64 are specified as a function of variables capturing social security value and labour market influences as in O'Brien (2010). This specification is intended to capture the main labour supply and demand variables of interest, and also reflecting the main policy variables recommended by the OECD and ILO, namely, pension reform and cyclical conditions. Equation 2 shows the basic specification:

$$LFPR_{kit} = f(ITAX_{kit}, RETAGE_{it}, UNEMPPR_{it}, PRIMEPOP_{it}) \quad (2)$$

where *LFPR* represents labour force participation rates for the age group *k* (55-59 or 60-64), country *i* (1 to 11) in time period *t* (1967 to 2009), *ITAX* is the implicit tax inherent in social security pensions for five years continued work for males aged 55 or 60 years, *RETAGE* is a country's normal or standard retirement age, *UNEMPPR* is the prime aged male unemployment rate, and *PRIMEPOP* is the percentage of prime aged males within the labour force aged (15-64 years) population. Two separate panel models are estimated for the 55-59 and 60-64 year age groups, respectively, incorporating eleven OECD countries over the time period 1967 to 2009.¹

The implicit tax (*ITAX*) on continued work is calculated as the percentage change in net pension wealth (contributions minus benefits) from an additional five years work in each country's typical early retirement route such as early retirement pensions, disability pensions, superannuation or unemployment related pensions. It is calculated for both males aged 55 and 60 for inclusion in their respective models. We would expect a negative relationship if additional contributions outweigh additional benefits and therefore impose an implicit tax on continued work (Gruber and Wise, 1998; Duval, 2003). Pension reforms promoted by the OECD imply a reduction in these implicit taxes to actuarial neutrality (*ITAX* = 0). The level of private savings of older workers would also have a financial influence on an individual's decision to retire. However, this data is not readily available for inclusion in the present model.

A country's standard retirement age (*RETAGE*) is also included to capture any effect from the age of receipt of the retirement pension, as opposed to early retirement related pensions. In particular, we would expect lower participation rates for the 60-64 age group if standard retirement age is below 65 years in particular countries and time periods (such as France). Both *ITAX* and *RETAGE* variables were obtained from Duval (2003) and Buis and Duval (2011).

Discouraged worker effects and the cyclical relationship between older worker labour force participation and labour market conditions is captured with the prime age male unemployment rate (*UNEMPPR*). Note that we cannot use the older male unemployment rate as it is co-determined with their labour force participation rate. Furthermore, as established in earlier research, the older age unemployment rates can conceal relatively high levels of hidden unemployment (O'Brien, 2001), making this measure misleading for capturing the state of the labour market for older males. The use of prime aged male unemployment rates addresses specification issues raised by Mincer (1966) and is consistent with previous modelling of older worker participation (see Blöndal and Scarpetta, 1998; and Duval, 2003).

As first proposed in Blöndal and Scarpetta (1998), the percentage of prime aged males within the working age male population (*PRIMEPOP*) is also included in this specification as an additional aggregate labour market constraint. This influence is similar to the long-run rather than cyclical labour force discouragement concept proposed by Standing (1978), the BLMR (1983) and Peck (1996). The hypothesis that any increase in the proportion of prime aged males in the labour force will crowd out older workers from participation implies a negative coefficient. However, it may be argued that the older workers of today with greater rates of university qualifications

¹ An unbalanced panel is used as data from 1967 onward is not available in all countries included in the analysis.

may be able to compete more readily with younger cohorts. Therefore, it remains to be seen if this coefficient is statistically significant.

A novel feature of the present research is to test for possible asymmetry in the relationship between labour force participation rates and the discouraged worker effect for older males. The rationale for this is to test whether an increase in older male participation rates from a cyclical upturn of a given size is the same in magnitude as decreased participation rates originating from a cyclical downturn of the same size. This will inform policymakers of the labour supply lost due to recessions and potential increases in participation from economic booms. This information is particularly important given the present policy context of attempting to increase older male worker labour force participation rates.

An asymmetric discouraged worker effect for total (not age specific) labour force participation has previously been estimated in Dixon (1995), Connolly (1997) and Lenten (2001) using different techniques. The methodology presented in Connolly (1997) specifically for a long run relationship is the most appropriate to apply to older male labour force participation in this case, as this specification is likely to produce an I(1) variable that can be tested alongside other I(1) variables for a possible cointegrated relationship.

Following Connolly (1997), the first step is to create a dummy equal to 1 if unemployment rates of prime aged males fell in a particular year and zero otherwise:

$$DUNEMPPR_{it} = 1 \text{ if } (UNEMPPR_{it} - UNEMPPR_{it-1}) < 0, \text{ and zero otherwise} \quad (3)$$

Next, two variables representing positive and negative change in prime unemployment rates are created:

$$\Delta UNEMPPR_{it}^{+ve} = (1 - DUNEMPPR_{it}) * \Delta UNEMPPR_{it} \quad (4)$$

and

$$\Delta UNEMPPR_{it}^{-ve} = DUNEMPPR_{it} * \Delta UNEMPPR_{it} \quad (5)$$

Finally, the two variables to be used in the long run equation consist of the cumulated positive and negative changes in prime unemployment rates, respectively:

$$CUMUP_{it} = CUMUP_{it-1} + \Delta UNEMPPR_{it}^{+ve} \quad (6)$$

and

$$CUMDN_{it} = CUMDN_{it-1} + \Delta UNEMPPR_{it}^{-ve} \quad (7)$$

Asymmetry can be established by testing whether the coefficients attached to $CUMUP_{it}$ and $CUMDN_{it}$ are significantly different using an F test.

All data is first checked for stationarity with a range of unit root tests at both the panel and individual country level. First, the Levin, Lin and Chu (LLC) test (Levin

et al., 2002) and the Breitung (BR) test (Breitung, 2000) assume a common unit root process across all cross sections. In addition, there are a number of other unit root tests employed in this paper that allow ρ_i to vary across different countries, namely, the Im, Peraran and Shin (IPS) test (Im *et al.*, 2003), and the Fisher-ADF and Fisher-PP tests (Maddala and Wu, 1999; and Choi, 2001). All variables are generally found to be I(1) across all these tests and included in their level form in subsequent modelling (see Appendix 1). Residuals from estimated models were then checked for stationarity using similar unit root tests to ensure cointegrated relationships (Engle and Grainger, 1987).

4. Analysis of Discouraged Older Male Worker Statistics

Figure 1 displays OECD average discouraged worker statistics for males aged 55–64 as a percentage of both their labour force (*DISC/LF*) and population (*DISC/POP*) from 1983 to 2010.² Also in this figure is the prime age male unemployment rates (*UNEMPPR*) representing cyclical fluctuations and also used in subsequent modelling. Two main features are notable. First, discouraged older male worker incidence is very low, being less than 0.5 per cent of the age group's labour force or population. Furthermore, in comparison to other demographic groups, older males are less likely to be discouraged than both youth and females (OECD, 2011).³ Secondly, in contrast to the patterns observed in prime aged unemployment rates, there is no obvious sign of a cyclical pattern in the older male discouraged worker statistics over the observed time period, apart from a small increase in more recent years coinciding with the Global Financial Crisis (GFC).

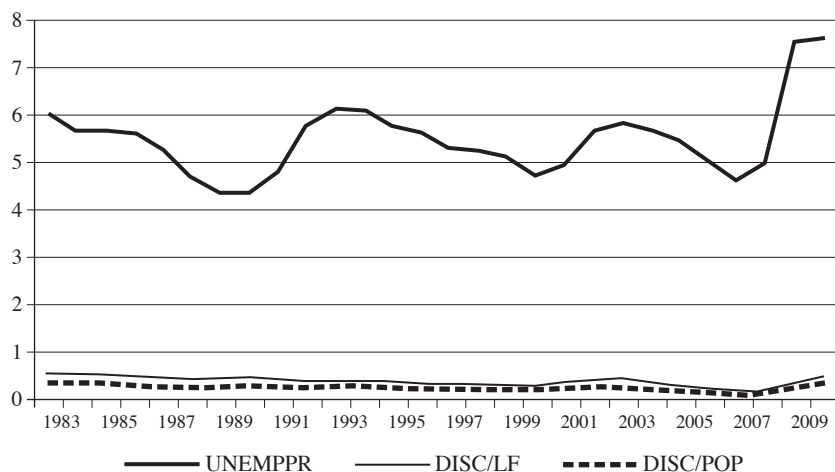
Table 1 shows estimation results from modelling the percentage of discouraged older male workers (*DISC/POP*) on the prime age male unemployment rate (*UNEMPPR*). The estimation results from Model 1, which includes the unbalanced country level panel data, suggests that if prime age male unemployment rates increased by one percentage point, the percentage of discouraged older male workers would increase by only 0.03 percentage points. The corresponding coefficient in Model 2, which uses OECD average data, displays a similar small coefficient of 0.023, which is significant only at the 10 per cent level. Therefore, these findings support the lack of cyclical pattern observed in discouraged worker statistics in figure 1.

The very low incidence of discouraged older male workers implies that an insignificant amount of hidden unemployment is concealed behind official unemployment rates. Therefore, not much would be gained by the adding discouraged older male workers to official unemployment rates, as advocated by some researchers, as this would provide little additional insight into the excess labour supply of older males. The lack of cyclical pattern would indicate that discouraged workers are perhaps more affected by structural unemployment considerations. This implies that discouraged workers would not necessarily be mobilised into the labour force by a cyclical upturn. However, it must be noted that a lack of country level data has hampered any deeper analysis into these issues.

² As noted previously, individual country level discouraged worker data is relatively scarce and therefore not shown here.

³ Not shown in this figure. Available from the author.

Figure 1 - Older Male Discouraged Workers and Prime Age Male Unemployment Rates (OECD average) – 1983 to 2010



Source: OECD (2011).

UNEMPPR = OECD average unemployment rates for prime aged (25-54 years) males.

DISC/LF = OECD average discouraged older male (55-64 years) workers as a percentage of their labour force.

DISC/POP = OECD average discouraged older male (55-64 years) workers as a percentage of their population.

Table 1 - Older Discouraged Male Worker (DISC/POP) Model*

	Model 1	Model 2
Constant	0.186 [0.006]	0.110 [0.142]
$UNEMPPR_{it}$	0.030 [0.006]	0.023 [0.09]
No of obs	135	28
R^2	0.493	0.723
$\bar{R}^2$	0.456	0.701
F	13.482 [0.000]	32.613 [0.000]
LLC	-5.009 [0.000]	
ADF	55.756 [0.000]	-7.278 [0.000]
PP	55.610 [0.000]	

Source: OECD (2011).

* Model 1 (unbalanced) individual country panel model (1976 to 2010). Model 2 OECD average model (1983 to 2010).

p value in brackets.

5. Older Male Labour Force Participation and the Discouraged Worker Effect

The estimation results of the models of older male labour force participation rates are displayed in table 2. The discouraged worker effect, as captured by UNEMPPR, is statistically significant for both age groups. A one percentage point increase in the prime age male unemployment rate is predicted to decrease labour force participation rates by 0.808 and 2.342 percentage points for males aged 55-59 and 60-64 respectively. Furthermore, the estimates suggest that the discouraged worker effect is the dominant influence on older male participation rates. For example, simulation of the model predicted an increase in labour force participation rates of approximately 3.591 percentage points from 1995 to 2007 (pre-GFC) for those aged 55-59, compared to an actual increase of 3.112. Decomposing this result, a 2.605 percentage point increase in participation can be attributed to the decrease in prime unemployment rates compared to an increase in participation of only 0.986 percentage points from decreased implicit taxes. Similarly, labour force participation rates for males aged 60-64 were predicted to increase by 9.314 percentage points over the same period compared to an actual increase of 7.481, with the cyclical influence contributing 7.545 percentage points of this increase compared to only 1.769 percentage points from a reduction in implicit taxes observed over this period. With regard to the GFC, all countries except Germany and Italy experienced at least a temporary decrease in older male labour force participation rates after 2007, contrary to the upward trends observed in all countries in the previous decade.

Table 2 - Older Male Labour Force Participation Rate Models (1967 to 2009)

	55-59	60-64
Intercept	111.488 [0.000]	31.938 [0.148]
$ITAX_{it}$	-0.050 [0.000]	-0.082 [0.000]
$RETAGE_{it}$	0.444 [0.029]	1.858 [0.000]
$UNEMPPR_{it}$	-0.808 [0.000]	-2.342 [0.000]
$PRIMEPOP_{it}$	-0.913 [0.000]	-1.360 [0.000]
No. of obs	427	440
R^2	0.841	0.849
$\bar{R}^2$	0.835	0.844
F statistic	155.167 [0.000]	170.976 [0.000]
LLC	-5.560 [0.000]	-7.252 [0.000]
ADF	58.600 [0.000]	94.295 [0.000]
PP	59.354 [0.000]	70.221 [0.000]

Source: OECD (2011), Duval (2003), Bouis and Duval (2011).
p value in brackets.

The model results contrast those from analysis of discouraged worker statistics. A large significant cyclical influence on older male labour force participation rates is implied by model estimates. This participation rate adjustment to cyclical conditions suggests that there are large amounts of hidden unemployment concealed behind official unemployment rates in times of recession that are not captured by the discouraged worker definition in labour force surveys.

6. Modelling Asymmetry in the Discouraged Worker Effect

Estimation results in table 3 indicate that older male labour force participation rates display an asymmetric response to cyclical fluctuations. The coefficient for cumulative increases in prime unemployment rates (*CUMUP*) is significantly larger than that for a decrease in unemployment rates (*CUMDN*). That is, the discouraged worker effect of decreased labour force participation from a cyclical downturn or recession is larger than an increase in participation rates from a cyclical upturn of similar magnitude. This is at odds with previous modelling of other age groups or females, however, is not unexpected for older males. For example, recent research has shown that older workers' removal from the labour force in cyclical downturns is likely to be permanent in nature as the retirement outcome is typically irreversible (Duval *et al.*, 2011).

Historically, older males are more likely to be displaced from employment during cyclical downturns and relatively unlikely to achieve re-employment in the short term compared to other age groups (Maetas and Li, 2006). They have traditionally had access to various social security pensions such as early retirement, disability pensions, or unemployment related payments not available to other age groups, and that do not required active search for employment, thus allowing exit from the labour force in lean times (Blöndal and Scarpetta, 1998). The existence of these pensions has allowed older workers to transition from employment to not in the labour force without necessarily passing through an unemployment pathway. It is also likely that access to these pensions allowed older males to be classified as not in the labour force due to retirement or ill health rather than identify as a discouraged worker in labour force surveys. In subsequent recoveries it is likely that older workers would enter the labour force at a slower rate than other age groups such as youth, either having become accustomed to pension reliance or in response to relatively few job opportunities.

Figure 2 shows the unemployment rates of older and prime aged male workers over the modelling time period (1967 to 2009). Unemployment rates for all age groups are remarkably similar in magnitude and display the same ratchet effect pattern. That is, unemployment rates rising rapidly at the onset of recessions and falling relatively slowly during subsequent periods of growth. The above model results indicate that a decline in labour force participation rates was a prominent adjustment mechanism to cyclical downturns for older males with labour force participation rates relatively slow to increase in subsequent recoveries. The findings imply that older male unemployment rates would have displayed a more pronounced ratchet effect in the absence of social security pensions that have effectively hidden the asymmetric discouraged worker effect from official unemployment statistics.

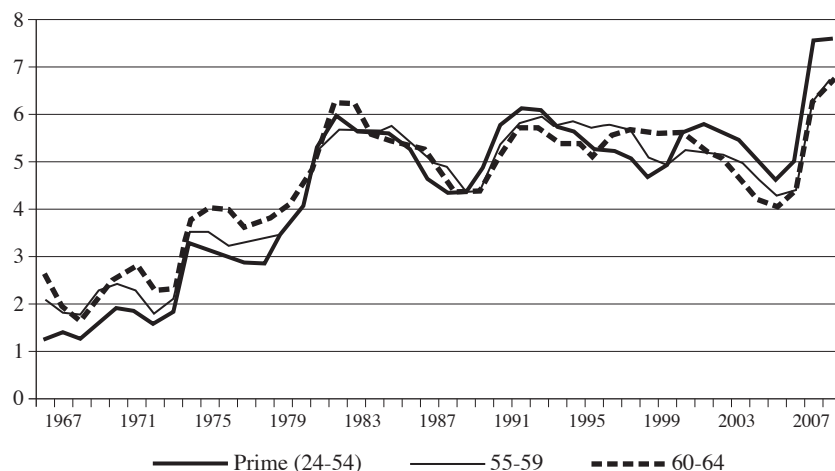
Table 3 - Model Results Allowing Asymmetry in the Discouraged Worker Effect (1967 to 2009)

	55-59	60-64
Intercept	104.142 [0.000]	-4.189 [0.838]
$ITAX_{it}$	-0.052 [0.000]	-0.085 [0.000]
$RETAGE_{it}$	0.370 [0.073]	1.901 [0.000]
$CUMUP_{it}$	-0.756 [0.000]	-2.092 [0.000]
$CUMDN_{it}$	-0.555 [0.000]	-1.430 [0.000]
$PRIMEPOP_{it}$	-0.727 [0.000]	-0.855 [0.000]
No. of obs	417	429
R^2	0.846	0.872
$\bar{R}^2$	0.841	0.867
F statistic	147.193 [0.000]	186.993 [0.000]
LLC	-5.218 [0.000]	-5.237 [0.000]
ADF	55.620 [0.000]	68.510 [0.000]
PP	56.013 [0.000]	58.856 [0.000]
$H_0: CUMUP_{it} - CUMDN_{it} = 0$ (F Test)	15.769 [0.000]	61.814 [0.000]

Source: OECD (2011), Duval (2003), Bouis and Duval (2011).
p value in brackets.

Most OECD research has emphasised the financial incentives embedded in social security pensions, or financial disincentives for continued participation, as the main driver of older male labour force participation rate trends (Blöndal and Scarpetta, 1998; Duval, 2003; and Duval *et al.* 2011). However, results presented here showed that the implicit tax of continued work (*ITAX*) had a very small influence on participation. It appears that the availability of safety nets in the form of social security pensions, rather than their financial attractiveness, has been a more important contributor to the resulting trends in labour force participation. An implication from the findings is that pension reforms advocated by the OECD will not be able to effectively increase older worker labour force participation rates without favourable cyclical conditions. It follows that the removal of pensions previously available to those individuals prior to standard retirement age may lead to higher official unemployment rates for older males in future recessionary times. Notably, the role of governments in actively tackling unemployment rates or stimulating the labour market does not appear to be addressed by more recent OECD policy reforms addressing the employment barriers faced by older workers (O'Brien, 2011).

Figure 2 - Unemployment Rates of Older and Prime Aged Males (OECD average) - 1967 to 2010



Source: OECD (2011)

7. Summary and Conclusions

The findings have a number of policy implications. First, there is no clear link between the two concepts of discouraged workers and the discouraged worker effect for older males. The low incidence of older males captured in discouraged worker statistics, combined with a lack of cyclical sensitivity, indicate that these statistics do not capture the hidden unemployment that is observed in the econometrically estimated discouraged worker effect. The econometric model results showed that older male labour force participation rates were indeed influenced by a significant and dominant cyclical effect. Changes in the labour force participation rate are thus an important adjustment mechanism for older males in the labour market. These results imply that substantial hidden unemployment has existed during recessionary times. However, the category in the labour force survey that we would expect to measure this concept does not seem to adequately capture it. It is likely that those marginally attached to the labour force may identify poor health as a reason for not actively searching for employment in the previous month. Similarly, those otherwise classified as NILF may cite early retirement as a reason for not searching for work rather than admitting that they have given up because of poor prospects of obtaining employment. The reasons cited for NILF status may reflect the individual's source of income such as disability pensions or access to other retirement funding rather than reflecting the unavailability of suitable employment. It follows that the discouraged worker statistics provide very little insight into the concept of hidden unemployment or excess labour supply. An implication from this is that little would be gained by including discouraged worker statistics in 'adjusted' unemployment statistics as advocated by some researchers. Unfortunately, deeper analysis of the discouraged worker statistics was hampered by limited data availability at the individual country level.

Second, the asymmetric nature of the discouraged worker effect showed that older male labour force participation rates are more sensitive to cyclical downturns than upturns. This finding is contrary to previous asymmetric modelling results for other demographic groups, however, it is plausible result for older workers. The permanent removal of older males from the labour force during recessionary times is likely the historical result of the availability of various social security pensions such as disability pensions accommodating otherwise unemployed older males. This would have the effect of allowing a form of early retirement, with largely irreversible consequences. This asymmetric labour force participation adjustment also implies that a more pronounced ratchet effect in official unemployment rates would have been observed if not the availability of these pensions that has masked what would otherwise be classified as unemployment in recessionary periods.

Finally, contrary to previous OECD research, model results also indicated that the financial incentives for labour force exit from early retirement income sources provided only a small or weak influence on participation outcomes in comparison to cyclical conditions. This implies that the large reliance on such pensions by displaced older workers acted more as a safety net to otherwise unemployed workers rather than being the result of a financially attractive avenue of exit from the labour force or a financial disincentive to participation. Therefore, OECD pension reforms to decrease the financial attractiveness of these pensions will have only a limited effect in stimulating labour force participation. Furthermore, other reforms aimed at removing pensions available to older males prior to standard retirement age may simply result in revealing unemployment in official statistics in future economic downturns that was previously masked or hidden. Therefore, a major implication of the findings presented here is that the pension reforms aimed at increasing older worker labour force participation advocated by the OECD are unlikely to achieve their desired outcome unless due attention is paid to prevailing labour market conditions and sustained economic growth.

Appendix 1

Results of Panel Data Unit Root Tests (1967 to 2009)*

Variables	Unit Root Test				
	IPS	ADF	PP	LLC	BR
$DISC/POP_{it}$	-0.329 [0.368]	22.742 [0.302]	30.471 [0.063]	-2.559 [0.005]	-0.336 [0.368]
$\Delta DISC/POP_{it}$	-1.450 [0.067]	55.1057 [0.000]	110.250 [0.000]	-6.810 [0.000]	-4.149 [0.000]
$LFPR_{55it}$	5.830 [1.000]	5.994 [1.000]	6.002 [1.000]	2.692 [0.997]	5.086 [1.000]
$\Delta LFPR_{55it}$	-14.124 [0.000]	191.860 [0.000]	519.228 [0.000]	-15.134 [0.000]	-8.062 [0.000]
$LFPR_{60it}$	5.494 [1.000]	10.690 [0.979]	10.240 [0.984]	1.802 [0.964]	7.797 [1.000]
$\Delta LFPR_{60it}$	-12.866 [0.000]	170.192 [0.000]	250.877 [0.000]	-12.726 [0.000]	-5.502 [0.000]
$ITAX_{55it}$	2.006 [0.978]	23.113 [0.395]	12.257 [0.952]	-2.191 [0.014]	1.437 [0.925]

Appendix 1 (continued)

Results of Panel Data Unit Root Tests (1967 to 2009)*

Variables	Unit Root Test				
	IPS	ADF	PP	LLC	BR
$\Delta ITAX_{55it}$	-6.183 [0.000]	85.465 [0.000]	85.890 [0.000]	-5.471 [0.000]	-3.281 [0.001]
$ITAX_{60it}$	-1.112 [0.133]	30.226 [0.113]	11.795 [0.962]	-3.792 [0.000]	0.963 [0.832]
$\Delta ITAX_{60it}$	-7.370 [0.000]	95.077 [0.000]	326.406 [0.000]	-8.956 [0.000]	-6.906 [0.000]
$RETAGE_{it}$	0.508 [0.694]	3.808 [0.703]	0.990 [0.986]	-0.953 [0.170]	-0.409 [0.341]
$\Delta RETAGE_{it}$	-2.663 [0.001]	19.414 [0.004]	12.440 [0.053]	-3.140 [0.001]	-3.336 [0.000]
$UNEMP_{it}$	-2.887 [0.002]	45.383 [0.002]	9.558 [0.990]	-1.730 [0.042]	-3.665 [0.000]
$\Delta UNEMP_{it}$	-6.402 [0.000]	83.952 [0.000]	42.479 [0.006]	4.423 [0.000]	1.405 [0.920]
$CUMUP_{it}$	-2.879 [0.002]	41.761 [0.007]	12.172 [0.954]	-2.334 [0.010]	-6.565 [0.000]
$\Delta CUMUP_{it}$	-5.572 [0.000]	71.617 [0.000]	42.924 [0.005]	-2.962 [0.002]	2.410 [0.992]
$CUMDN_{it}$	0.547 [0.292]	28.625 [0.156]	11.222 [0.971]	-0.539 [0.295]	1.565 [0.941]
$\Delta CUMDN_{it}$	-9.178 [0.000]	117.505 [0.000]	99.999 [0.000]	-10.054 [0.000]	-6.079 [0.000]
$PRIMEPOP_{it}$	-0.256 [0.399]	36.590 [0.026]	2.567 [1.000]	-0.759 [0.224]	1.328 [0.908]
$\Delta PRIMEPOP_{it}$	-3.653 [0.000]	54.811 [0.000]	72.795 [0.000]	-2.083 [0.019]	-0.670 [0.252]

Source: OECD (2011), Duval (2003), Bouis and Duval (2011).

* Test statistic reported with p-value in brackets.

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