



# Discouraged workers in developed countries and added workers in developing countries? Unemployment rate and labour force participation



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## ABSTRACT

Changes in the unemployment rate can have differing impacts on the labour force participation rate depending on the strength of the added worker effect and the discouraged worker effect. This paper documents the differences in the relationship between the unemployment rate and the labour force participation rate across a panel of developing countries and OECD countries. We employ a system GMM approach to control for and to establish the bi-directional causality between unemployment and labour force participation. We find that the discouraged worker effect does dominate in developed countries, while dominance of the added worker effect in developing countries leads to an increase in labour force in the face of rising unemployment.

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## 1. Introduction

The effect of unemployment on labour force participation decisions has always been a topic of interest as evidenced from an early contribution by Mincer (1966). Understanding and quantifying the relationship between unemployment rate and labour force participation rate is important as it characterises the nature and dynamics of unemployment during business cycles in an economy. Hence, it has implications for the trade-off between inflation and unemployment. Changes in labour force, particularly endogenous changes in response to a change in unemployment rate, also complicate accurate measurement and diagnosis of the extent of unemployment. This paper contributes to the understanding of the effect of unemployment on labour force participation in two ways. (i) We account for the differences in labour market structures and institutions by controlling for institutional variables and by exploring the differences between developed countries and developing countries and (ii) we employ system GMM estimations to account for the bi-directional causality between unemployment and participation.

Changes in prevailing labour market conditions affect the individual participation decisions; these influences are captured by the added worker effect and the discouraged worker effect. The discouraged worker effect predicts a negative relationship between unemployment and participation. An increase in unemployment (or a reduction in probability

of employment and/or remuneration) discourages people from actively looking for work as the costs of active job search increase and the benefits go down (Cahuc and Zylberberg, 2004). As people stop actively looking for work, they are no longer counted as a part of labour force. The discouraged effect can be substantial; OECD estimates suggest an OECD average of 0.5% of labour force who wants to work and are available for work but are not actively looking for work (OECD, 2012). At the same time, models of intra-familial choice account for interdependence of participation decisions within a family. In this family utility maximization framework, the earnings losses of one family member may be offset by increases in labour supply of other members, thus mitigating the adverse shock to the family income. This effect is termed as the added worker effect. Stephens (2002) finds substantial evidence in support of added worker effect. In contrast to the discouraged worker effect, the added worker effect hypothesizes a positive effect of unemployment on participation.<sup>2</sup>

Thus, net change in aggregate participation rate, in response to a change in unemployment rate, depends on the relative strength of the added worker effect and the discouraged worker effect. These effects, in turn, depend on the composition of the labour force and the structural aspects of the labour market and the economy. This paper provides an insight into the relationship between unemployment and labour force participation in the context of the differences between developed countries and developing countries. Empirical studies have overwhelmingly focused on developed countries and primarily on female labour

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<sup>2</sup> Note that participation will increase due to added worker effect but the effect on employment is ambiguous. It is likely that these workers join unemployment pool or enter into casual employment.

force participation. Though the theory suggests that the strength of added-worker effect and discouraged worker effect and, hence, the direction of change in labour force participation in the face of higher unemployment would differ across developed countries and developing countries, this issue has not previously been empirically examined.

Developing countries are characterised by higher levels of unemployment, an absence of unemployment insurance, low level of access to social security and welfare support, and lower levels of income. These institutional factors suggest that the added worker effect is likely to be stronger in developing countries. On the other hand, access to non-wage income in the form of government payments, private savings and access to education and training opportunities in developed countries will result in a dominant discouraged worker effect. We empirically investigate the hypothesis that the unemployment rate will have a positive effect participation rate in developing countries, but is likely to have a negative effect in developed countries. In our investigations we also control for two institutional features of the labour market, unemployment benefits and employment protection legislation.

Estimations of the relationship between the participation rate and unemployment rate need to address the endogenous nature of these two variables. Labour force participation rate has a direct effect on unemployment. An increase in participation rate, everything else remaining constant, will lead to an increase in unemployment rate. The magnitude of the increase in unemployment rate depends on the extent of employment creation. On the other hand, an increase in unemployment rate changes the incentives for job search and the probability of finding employment and, hence, has an effect on participation decisions. As income falls and the probability of unemployment rises, non-participating members of a family may be forced into the labour force. These 'added workers' would lead to an increase in the labour force participation rate. Rising unemployment rate would also discourage some workers from joining the labour force or cause some existing participants to stop actively looking for work. This 'discouraged worker' effect implies an inverse relationship between the unemployment rate and labour force participation rate. Our methodology allows us to address the interdependence between these two variables.

We investigate the mutual effects of unemployment rate and labour force participation rate and whether it differs among groups of developing countries and developed countries. We employ system GMM estimation using a panel dataset of developed and developing countries. The present paper is the first application of system GMM to investigate the effect of unemployment on labour force participation rate. Using panel data and system GMM allows us to (i) exploit the time-series and cross-section dynamics of the unemployment rate and participation rate, and (ii) control for heteroscedasticity as well as endogeneity.

The results confirm bi-directional causality between labour force participation and unemployment. The direction and magnitude of the effect differs between developing countries and OECD countries. The discouraged worker effect is prominent for male and female workers in OECD countries, while in developing countries the added worker effect is dominant. Disaggregation by gender and age reveals the presence of added worker effect for young and relatively older workers in developing countries, whose participation increases with a rise in unemployment. The paper is structured as follows. Section 2 relates the present study to theoretical and empirical literature. Data and methodology is documented in Section 3. Section 4 reports and discusses estimation results and Section 5 concludes.

## 2. Literature review

The dynamics between participation and unemployment plays a key role in macroeconomic models and understanding this relationship is important for policy prescriptions deriving from theoretical models. Rogerson et al. (2005) and Rogerson and Shimer (2010) investigate this link in the context of search models, while Veracierto (2008) applies it to evaluate real business cycle model. Prescott (2004) and

Wallenius and Prescott (2012) study this relationship in terms of the allocation of time between work and leisure. Pries and Rogerson (2004, 2009) extend the three state decision-theoretic search model to account for heterogeneous workers. The model offers a theoretical link between job search durations and labour market participation. In particular, they propose that the participation decisions of workers are sensitive to frictions that affect job-finding rates and that these can explain the differences in the labour market behaviour of women and younger workers versus prime aged men. In this context, we investigate the labour market participation by disaggregating on the basis of gender and age.

Cross-section analysis using detailed micro data gives an insight into individual response to a change in labour market conditions. Stephens (2002) finds evidence of added worker effect in the long run response of a wife's labour supply to her husband's job loss in the US. In a recent comprehensive study, Bhalotra and Umana-Aponte (2010) analyse the cyclical nature of women's labour supply in 63 developing and transition countries. However, while these studies give us precise and detailed insights into the behaviour of an individual or a particular demographic group, they provide only a rough guide to the changes in aggregate unemployment rate and participation rate over time.

Time series analyses of the relationship between participation rate and unemployment rate have concentrated on developed countries. In an early study of OECD countries, Elmeskov and Pichelmann (1993) estimate the elasticity of participation rates with respect to employment and find that such elasticity is high, particularly for younger and older age groups (compared to prime-age adults). Darby et al. (2001) investigate the response of the labour force participation rate to business cycles in France, Japan, Sweden and the US. They find that discouraged worker effect is prevalent but essentially a female phenomenon, particularly in the older age group (45–54 years). Benati (2001) finds support for the discouraged worker effect for the overall series as well for a number of age–sex disaggregations in the US. Wasmer (2009) investigates the causal links between participation and unemployment in four countries, France, Germany, Italy and the US, and finds that the effects differ between the US and Europe. In European countries, unemployment shocks have a short run effect on participation and participation shocks have a short run effect on unemployment. In contrast, the main drivers of short run changes in unemployment and participation in the US are unemployment shocks and participation shocks themselves. Parker and Skoufias (2004) find evidence of a significant added worker effect for women in Mexico. Thus, empirical evidence points to differences in the dominance of discouraged worker effect across developed countries and developing countries. We explore these differences directly by comparing the two groups of countries.

In a related strand of literature, recent studies have analysed the time-series properties of labour force participation rate. Gustavsson and Osterholm (2006) find the labour force participation rate in Australia, Canada and the U.S. to be non-stationary. Madsen et al. (2008) support this finding for G7 countries over a long time period of 130 years.

## 3. Data and methodology

We investigate the following equations:

$$LFPR_{it} = \beta_0 + \beta_1 LFPR_{it-1} + \beta_2 UN_{it} + \beta_3 UB_{it} + \beta_4 EPL_{it+1it} \quad (1)$$

$$UN_{it} = \alpha_0 + \alpha_1 UN_{it-1} + \alpha_2 LFPR_{it} + \alpha_3 UB_{it} + \alpha_4 EPL_{it+2it} \quad (2)$$

LFPR denotes the labour force participation rate for country  $i$   
UN denotes the unemployment rate for country  $i$

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