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ESTIMATING THE IMPACT OF STRUCTURAL REFORMS ON THE FEMALE PARTICIPATION RATE

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BOX 2: ESTIMATING THE IMPACT OF STRUCTURAL REFORMS ON THE FEMALE PARTICIPATION RATE[1]

Introduction

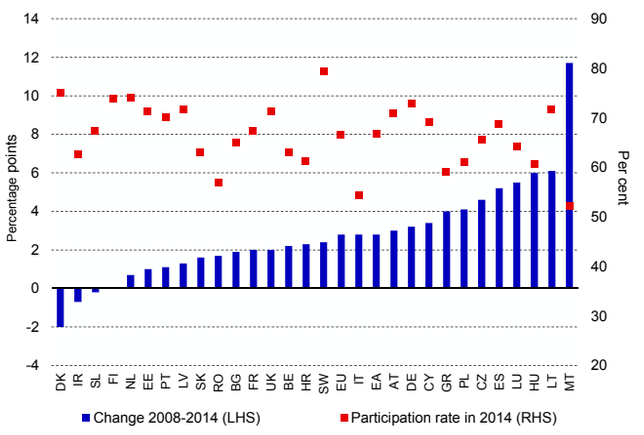
Structural reforms are policies that permanently and positively affect the supply side of the economy. These reforms increase the economy's potential output – the amount of output that can be sustainably produced without leading to distortions in factor markets – by raising the inputs to production, such as the supply or quality of labour or capital, or by ensuring that these inputs are used more efficiently. They also augment the resilience of an economy to adjust to shocks and facilitate the reallocation of resources within and across sectors.[2]

In recent years the Maltese Government implemented a number of reforms to address the objectives of the Europe 2020 Strategy, including those targeted to raise the female participation rate in the labour market. These reforms have started to bear fruit. Between 2008 and 2014, the female participation rate in Malta increased by 11.7 percentage points, by far the highest increase registered among European Union (EU) countries (see Chart 1). Despite this improvement, however, the female participation rate, at 52.1% in 2014, still remains one of the lowest in the EU.

The increase in female employment was facilitated by a number of government initiatives undertaken to raise the participation rate of women in the labour market. Measures include back-to-work fiscal incentives, new income tax computations, an increase in maternity and adoption leave, tax credits for self-employed and exemptions from means-testing for income earned by women working part-time. Self-employed women working on a part-time basis, as in the case of employed persons, were given the opportunity to choose to pay a 15% tax rate on their income.

Childcare facilities were made more available and affordable. A number of public childcare centres were opened and their operational hours extended to 1600hrs to cater for working parents. After-school care services were also introduced in several schools to bridge the gap between day school and regular working hours of parents in employment. Other initiatives were undertaken to provide care for children before schools' official opening hours, to allow additional flexibility to working parents.

Chart 1
FEMALE PARTICIPATION RATE IN EU COUNTRIES
(percentage points; per cent)



Source: Eurostat.

In conjunction with the above initiatives, a number of measures were taken to further improve basic skill attainment and reduce the

[1] Prepared by Brian Micallef. The author is a Principal Research Economist in the Bank's Modelling and Research Department. This Box summarises the main findings of Micallef, B., "Estimating the impact on potential output of structural reforms to increase the female participation rate", *Policy Note*, Central Bank of Malta, November 2015. Any errors, as well as the views expressed in this note, are the author's sole responsibility.

[2] Draghi, M., "Structural reforms, inflation and monetary policy", *Speech* delivered to the ECB Forum on central banking, May 2015.

number of early school leavers to strengthen the employability prospects of people joining the labour market.

Against this background, this Box estimates the impact of structural reforms on the economy's supply potential through an increase in the female participation rate. First, the potential output of the Maltese economy is calculated using a production function approach, which decomposes potential output into the effects of labour, capital and total factor productivity. The impact of reforms is then calculated by adjusting the rise in the participation rate using two different approaches to account for the effects of an ageing population and compositional changes, both in terms of demographics and educational attainment.

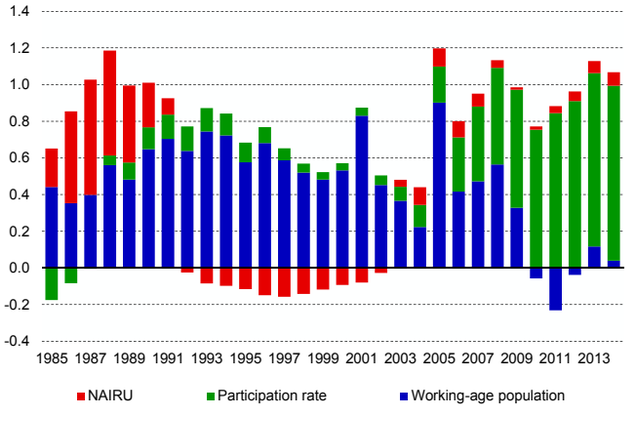
Estimating the supply side

The impact of changes in the participation rate on potential output is calculated using a production function to model the supply side of the Maltese economy. The production function relates output to the level of technology and factor inputs, namely labour and capital, by means of a constant-returns-to-scale Cobb-Douglas specification. The labour component is further decomposed into the effects of the working-age population, the trend participation rate and the structural unemployment rate.

The results point to substantial changes in potential output growth over the past three decades, with a trend decline in potential output in the 2000s compared with the growth rates registered in the 1980s and 1990s. The slowdown in the early 2000s is attributable to both demand and supply-side elements, with the cyclical upswing between 2005 and 2008 being interrupted by the Great Recession of 2009.[3] Contrary to the experience of other countries, however, potential output in Malta has recovered after the crisis and has even exceeded the pre-crisis peak, standing at 3.1% in 2014.

Chart 2 decomposes the contribution of labour to potential output growth. In the years before the recession, the increase in the working-age population was the main driver of the trend labour supply. Since 2009, however, the unfavourable effects of an ageing population started to weigh in, with a gradual decline in the contribution of the working-age population. These effects have been outweighed by the rising participation rate, mostly of females, which has contributed, on average, 0.8 percentage point per annum to potential output growth between 2008 and 2014. Although to a much lesser extent, developments in the non-accelerating inflation rate of unemployment (NAIRU) have also positively contributed to potential

Chart 2
THE CONTRIBUTION OF LABOUR SUPPLY
(percentage point contribution to potential output growth)



Source: Author's calculations.

[3] Grech, A. G. and Micallef, B., "Assessing the supply side of the Maltese economy using a production function approach", *Quarterly Review* 2013:4, Central Bank of Malta.

output growth after the crisis, as the increase in the unemployment rate during the recession proved to be temporary and has since declined to near historical lows.[4]

Adjustments to the participation rate

While it is undeniable that government initiatives played an important role in raising the female participation rate in recent years, the overall increase masks the effects of factors unrelated to reforms. After all, in addition to government policy, the participation of women in the labour force is determined, to a large extent, by the level of female education, the overall labour market conditions and cultural attitudes. In the case of Malta, the decline in the working-age population and changes in the structure of the labour force could also have exerted an impact on the participation rate.

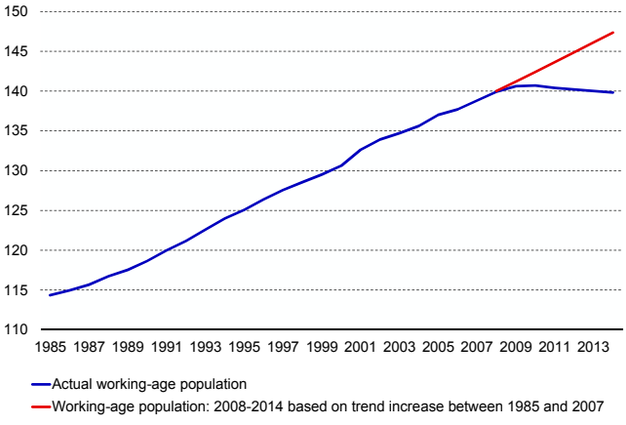
The impact of structural reforms is identified using two different approaches.[5] The first is based on an aggregate approach, in which adjustments are made to account for both the decline in the working-age population and the trend increase in the female labour supply. The second method is based on a cohort model of labour participation to focus on the importance of compositional changes in the female participation rate, both in terms of demographics and educational attainment.

Method 1: Aggregate approach

Apart from the reforms, there are at least two factors – the decline in the working-age population and changes in the structure of the labour force – that could have positively influenced the female participation rate in Malta in recent years. For instance, women finishing tertiary education will join the labour force irrespective of government incentives to attract more women back in employment.

Chart 3 shows that the impact of an ageing population kicked in around 2008-2009, with a sharp decline in the growth rate of the working-age population. An ageing population could create an upward bias on the impact of reforms on the participation rate. To adjust for this effect, Chart 3 considers an alternative, hypothetical scenario in which the working-age population is assumed to increase by 0.9% per annum between 2008 and 2014, its average growth over the period 1985-2007. According to this assumption, the working-age population of females would have increased to around 148,000 in 2014 instead of 139,800.

Chart 3
ACTUAL AND HYPOTHETICAL WORKING-AGE POPULATION
(thousands of persons)



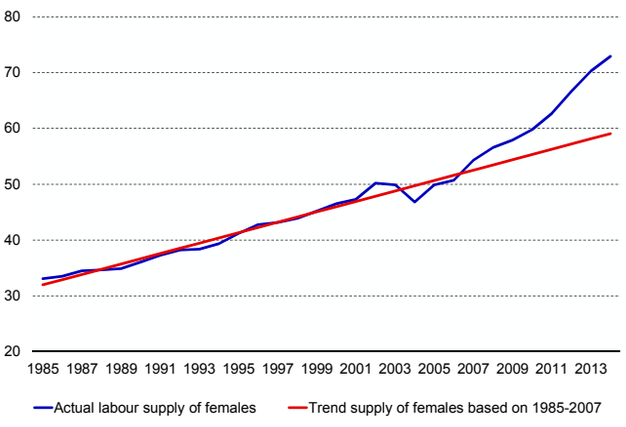
Sources: Labour Force Survey; author's calculations.

[4] Micallef, B., "Developments in Malta's structural unemployment rate", *Quarterly Review* 2014:2, Central Bank of Malta.

[5] A common approach to study the impact of reforms is to use the difference-in-differences (DID) estimator. This approach is used to identify the impact of policy changes when only part of the population is affected by the change in policy. The population is divided in two categories, the treatment group that is affected by policy and the control group, which remains unaffected. The key identifying assumption behind this approach is that trends for both the treatment and control groups would have been the same in the absence of a change in policy. An application of DID for Malta is particularly challenging. Identifying an appropriate control group is difficult as a number of initiatives targeted women in all age brackets, while the reforms were staggered over a number of years. An application using the DID estimator to calculate the impact of reforms on the female participation rate will be left for future research.

Turning to the labour supply, Chart 4 plots the labour supply of females, together with a fitted trend estimated over the period between 1985 and 2007, which is extended between 2008 and 2014. The latter is intended to simulate the trend increase in female labour supply that would have occurred irrespective of labour market reforms. The chart clearly shows that the increase in female labour supply since 2008 has by far outpaced the fitted trend line.

Chart 4
ACTUAL AND HYPOTHETICAL LABOUR SUPPLY OF FEMALES
(thousands of persons)



Sources: Labour Force Survey; author's calculations.

Adjusting for these two effects would lower the female participation rate by 3.3 percentage points in 2014, from 52.1% to 48.9%. This means that, according to this approach, out of the 11.7 percentage point increase in the female participation rate since 2008, around one-fourth could not be explained by the decline in the working-age population and the natural increases in the labour supply of females. Hence, it could potentially be attributable to labour market reforms.

Method 2: Cohort model of labour force participation

The second approach is based on a cohort model of labour force participation. This method decomposes the participation rate into the weighted sum of the participation rate of different demographic groups.

Over the past decade, there were changes in both the demographic composition of the female population and the participation rates by age bracket. During this period the population share in the 25-39 age category has remained broadly unchanged at around 25% of the population aged 15 and above. The shares of the other categories have declined with the exception of the older group, especially those above 65 years of age. The latter category has seen its share rising from 17% in 2000 to 22% in 2014.

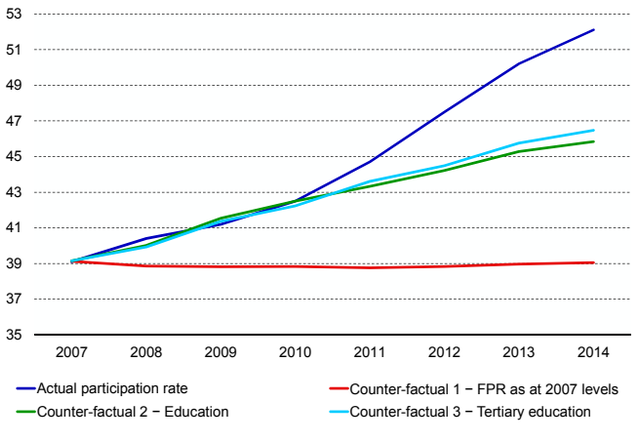
There were also notable changes in the participation rate of different age groups. Increases were registered in the participation rate of almost all age brackets, with the exception of teenagers and young adults. The participation rate of the latter group has been declining, a trend that is also observed in EU countries, as more young people opt to further pursue their studies.

To understand the importance of changes in labour force participation rates of different demographic and educational groups, Chart 5 presents three different counter-factual exercises.[6] In the first exercise, female participation is kept fixed at its 2007 level, while the demographic composition of the population is allowed to follow its actual path. The second exercise keeps the participation rate for the three different education categories unchanged at 2007 levels and allows the demographic composition by education level to follow its actual path. In the third exercise, the female participation rate for low and medium education is fixed at 2007 levels but the demographic composition by education and the participation rate of those with a tertiary level of education is allowed to follow its actual path.

[6] A similar exercise is presented in Kudlyak, M., "A cohort model of labour force participation", *Economic Quarterly*, Volume 99, Number 1, Federal Reserve of Richmond, First Quarter 2013.

The simulations point to different results. The hypothetical participation rate from the first exercise, which kept the participation rate fixed at 2007 levels, remained broadly unchanged, as the decline in some age brackets was offset by increases in the older category. The share in the largest age bracket, those between 25 and 39, remained broadly constant. In contrast, the other two simulations point to increases in the participation rate owing to a rise in the share of the population with a medium and high level of education, and to a corresponding drop of those with only a primary or lower secondary education. However, the latter two exercises are not enough to explain the increase in the female participation rate observed since 2008: the impact of a higher level of education raises the hypothetical participation rate to 46% - 47% by 2014, around 6 percentage points lower than the actual participation rate of 52.1%. Moreover, the gap between the actual and hypothetical participation rate started to increase from 2011, suggesting that, on their own, demographic and educational changes in the female population are not enough to explain the sharp increase in the female participation rate.

Chart 5
COUNTER-FACTUAL EXERCISES FROM COHORT MODELS
(per cent)



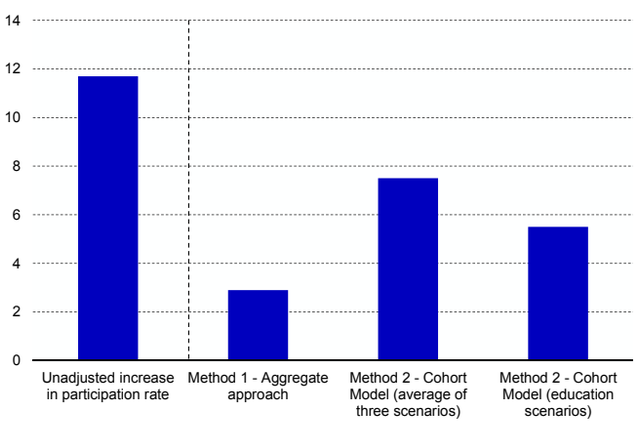
Source: Author's calculations.

The impact of reforms

The exercises in the previous section point to a positive impact of labour market reforms on the female participation rate in recent years. Calculating the precise impact of reforms, however, is challenging and surrounded by a degree of uncertainty since different methods provide different estimates. The fact that the reforms consist of various measures that were introduced gradually over a number of years further complicates this task.

Chart 6 compares the various approaches outlined in this Box with the unadjusted participation rate, which increased by 11.2 percentage points between 2008 and 2014. The first approach adjusts both the labour supply and the working-age population to account for the trend increase in the female participation rate in the labour market that is

Chart 6
IMPACT OF REFORMS ON FEMALE PARTICIPATION RATE
(percentage point difference between 2008 and 2014)



Source: Author's calculations.

unrelated to reforms and the ageing population. According to this approach, the increase in the participation rate owing to reforms amounted to around 3 percentage points since 2008. The second approach was based on a cohort model of the participation rate that accounted for changes in both the demographic composition and the education attainment of the female population. According to these models, the impact of reforms on the participation rate since 2008 stood between 5.5 and 7.5 percentage points.

Taking the median of the three approaches in Chart 6, slightly less than half of the 11.7 percentage point rise in the female participation rate between 2008 and 2014 is attributable to labour market reforms. According to the production function approach, the trend increase in participation rate contributed, on average, to 0.8 percentage point per annum to potential output growth between 2008 and 2014. The latter includes the effect of both males and females. During this period, females accounted for around 80% of the increase in the labour force. Combining all these effects, the impact of various labour market reforms to raise the female participation rate is calculated to have augmented the economy's potential output growth by 0.3 percentage point per annum over the past six years.