Female labour force participation and economic growth in the South Mediterranean countries[☆]

Stella Tsani[*], Leonidas Paroussos, Costas Fragiadakis, Ioannis Charalambidis, Pantelis Capros

E3M Lab, National Technical University of Athens, Department of Electrical and Computer Engineering 9, Iroon Politechniou Str., 15 773, Zografou Campus, Athens, Greece

HIGHLIGHTS

- We study female labour participation and economic growth in the South Mediterranean.
- A two-step approach of econometric and general equilibrium modelling is employed.
- Econometric estimations confirm the U-shaped female labour force function.
- Higher female labour force participation rates have a positive impact on growth.

ARTICLE INFO

ABSTRACT

We investigate the relationship between female labour force participation and economic growth in the South Mediterranean countries with a two-step methodology of econometric exercise and general equilibrium modelling. Econometric estimations on female labour participation confirm the U-shaped function and the presence of region-specific barriers. Estimations have been employed in a satellite manner to a general equilibrium model for the simulation of (i) changes in female labour force participation as a result of income developments and (ii) lowering of region-specific barriers to female labour force participation. The results suggest that while the first may lead to marginally lower economic growth, the second may have a considerable positive impact on growth.

© 2013 Elsevier B.V. All rights reserved.

1. Introduction

Female labour participation rates in the South Mediterranean[1] countries remain low as compared to other developing and developed countries. Civil uprisings in the region are calling for social and economic reforms and a boost of employment opportunities. It is still an open question how the regions' social and economic future will evolve; however, developments might present an opportunity to enhance women's economic, social and political inclusion. This paper assesses the impact of female labour force participation changes on the economic growth of the South Mediterranean countries. For this purpose a two-stage approach of econometric and general equilibrium modelling is adopted.

At the 1st stage an econometric model of female labour force participation is used. The derived estimations are employed in a satellite manner to the 2nd stage where a computable general equilibrium model, the GEM-E3-MEDPRO model,[2] is employed for the simulation of two alternative scenarios of female labour force participation in the region. The first assumes lower participation rates associated with income developments in the region projected

[2] The GEM-E3-MEDPRO model is a version of the GEM-E3 model. E3MLab and other contributors have extended the GEM-E3 in various directions, including development of model versions suitable for analysing growth and structural policies. The model has been extensively used in a series of studies completed for the European Commission and in several research projects. See: http://ipts.jrc.ec.europa.eu/activities/energy-and-transport/gem-e3/.

Table 1
Reference scenario GDP and female labour force.
Source: Authors' estimations.

	GDP annual growth rate, in % (2010–2030)	GDP in 2030, in bn US $	GDP per capita in 2030, in US $	Female labour force in 2030, in % of total labour force
Algeria	3.03	286.5	6,363	15.83
Egypt	4.69	379.1	3,459	23.73
Israel	4.03	412.1	41,144	46.60
Jordan	4.64	49.9	5,764	17.47
Lebanon	3.09	52.1	10,888	25.20
Libya	4.13	163.4	20,074	27.84
Morocco	4.05	186.9	4,880	27.42
Syria	3.97	108.5	3,826	16.06
Tunisia	4.78	100.5	8,039	26.65
Turkey	4.09	1811.2	20,394	25.91
Palestine	4.23	13.3	1,435	17.88

to occur in 2015–2030. The second simulates the effects of the removal of region-specific barriers to female labour force participation. The rest of the paper is organized as follows. Section 2 reviews the employed methods and data. Section 3 discusses the findings. The last section concludes with some policy considerations.

2. Methods and data

The literature offers a rich and well-established discussion on the economic factors and personal characteristics affecting female labour force participation.[3] An equally rich set of work documents the U-shaped relationship between female labour force participation rates and economic growth.[4] The existing literature on the determinants and the characteristics of female labour force participation has been employed for the development of the econometric model summarized as follows:

$$FLPR_{i,t} = b_0 + b_1 LGDP_{i,t} + b_2 LGDP_{i,t}^2$$
$$+ \sum_{n=1}^{k-1} b_n X_{n,i,t} + b_k MED11_{i,t} + e_{i,t} \quad (1)$$

where $FLPR_{i,t}$ is female labour force participation rate, $LGDP_{i,t}$ is the log of the real GDP per capita, $LGDP_{i,t}^2$ its square, $X_{n,i,t}$ is a set of n variables controlling for education, fertility, urbanization, religious norms and unemployment rates. $MED11_{i,t}$ is a dummy variable controlling for the South Mediterranean countries. $e_{i,t}$ is the error term capturing all other omitted factors, measurement errors and possible misspecifications. Pooled time series cross-section data are employed for 160 countries for the period 1960–2008. The econometric model has been used so as to estimate the effects of income changes and region-specific differentials on female labour force participation. The quantification of the latter is important in order to exogenously estimate the female labour force entering the general equilibrium model for the simulation of alternative scenarios.

The estimated coefficients on the relationship between income and female labour force participation and on the dummy variable controlling for the South Mediterranean countries, have been employed in a 2nd step for the simulation of the alternative scenarios on female labour force participation rates in the region. The coefficients estimated on the dummy variable are assumed to capture region-specific cultural and social norms, not captured by other covariates, which may be manifested in family structures and legal codes and constrain female labour force participation.

For the scenarios' simulation GEM-E3-MEDPRO has been used. GEM-E3-MEDPRO is a computable general equilibrium multi-country model, treating each country separately and linking them through an endogenous trade of goods and services. The model includes multiple industrial sectors and economic agents. The version employed in the present work considers 19 countries/regions and 23 economic activities[5] and it is solved for the time period 2015–2030 following 5-year time steps. The model is calibrated on the GTAP v.8 database (2007 base year).

In general equilibrium models it is the deviations from the reference scenario, which are the key for the evaluation of structural changes. The reference scenario relates to the development of an economic outlook for each region and sector of the GEM-E3-MEDPRO model. The present paper has made use of the reference scenario developed by Paroussos et al. (2012). Table 1 summarizes the growth assumptions and the GDP projections of the reference scenario.[6] In this scenario a total pool of the labour force is assumed without making any assumptions on the male and female shares in it. The present paper extends the work of Paroussos et al. (2012) by making appropriate assumptions on female and male shares of labour force and on the female labour force participation rates in the reference scenario.

For this purpose total, male and female active population data extracted from ILO, and active population growth rates provided by Groenewold et al. (2012) have been used. ILO provides projections up to 2020. For the period 2020–2030 it is assumed that trends recorded over the period 2007–2020 continue to prevail. Data on the female share to the labour force have been extracted from The World Bank databank (2011 edition). The female share in the total labour force has been assumed to stay close to the current levels and not change significantly up to 2030 (Table 1).

Two alternative cases have been simulated and compared to the reference scenario. In both cases the econometric estimations have been employed so as to estimate the exogenously set female labour force. The 1st alternative assumes that growth in per capita income levels estimated in the reference scenario will be associated with

---

[3] Education, fertility rate, urbanization, unemployment and economic growth have been suggested as factors determining female labour participation (see Kottis, 1990, Mishra and Russell, 2010 and references therein). With regard to the South Mediterranean countries, an increasing volume of work has been pointing at the importance of the interpretation of religious and cultural aspects and their manifestation through different regulations, social and family norms regarding women's rights and opportunities (Youssef, 1978; Clark, 1991; Moghadam, 2004a,b). Persistence of the patriarchal family unit has also been argued to have constituted a significant customary constraint on women's mobility and employment (Kandiyoti, 1988; Moghadam, 1993).

[4] See Tam (2011) and references therein for instance.

[5] GEM-E3-MEDPRO regional and sectoral aggregation are summarized in the Appendix, Tables A.1 and A.2 respectively.

[6] The reference scenario assumes a continuation of current policies in the region up to 2030. The development of the reference scenario has been based on the growth projections for the South Mediterranean counties provided by Coutinho (2012). Growth projections extend to 2030 and take into account the effect of the Arab spring on the long-term growth prospects of the region.