ESSAYS ON DEMOGRAPHICS, STRUCTURAL CHANGE AND THE MACROECONOMY

This doctoral thesis in Economics consists of three chapters examining the macroeconomic impact of demographic and structural changes.

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Essays on Demographics, Structural Change and the Macroeconomy
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Andrea Papetti
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A Carolina, Simonetta e Paolo
Foreword

This volume is the result of a research project carried out at the Department of Economics at the Stockholm School of Economics (SSE).

This volume is submitted as a doctoral thesis at SSE. In keeping with the policies of SSE, the author has been entirely free to conduct and present his research in the manner of his choosing as an expression of his own ideas.

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Stockholm School of Economics
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Undertaking the path leading to write a Ph.D. thesis involves some isolation which one is tempted to consider the matter of a superior choice. For me it was rather born of the necessity to learn the suitable tools for thinking in economics, thus obtaining in a sense ‘the right to speak’ and ultimately allowing for a new beginning associated with the condition of plurality characterizing the *vita activa* (Hannah Arendt).

This undertaking would have been much harder without the help of my primary supervisor, Lars Ljungqvist, to whom I am immensely grateful. He was essential in sharing the purity of his economic thinking, to reduce matters to first principles as well as to provide prompt suggestions to have the thesis timely completed.

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A final special thanks to Nicoló Cavalli – the third chapter originates from a discussion with him – and to all the friends that managed to be so close to me during my doctoral studies. Our homeland resides in a act of free will, dear and necessary.

*Frankfurt am Main, May 5, 2019*

*Andrea Papetti*
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We have this unusual degree of knowledge concerning the future because of the long but definite time-lag in the effects of vital statistics. Nevertheless the idea of the future being different from the present is so repugnant to our conventional modes of thought and behaviour that we, most of us, offer a great resistance to acting on it in practice.

— J. M. Keynes 1937, Some Economic Consequences of a Declining Population

A temporary period of policy rates being close to zero or even negative in real terms is not unprecedented by any means. Over the past decades, however, we have seen long-term yields trending down in real terms as well, independent of the cyclical stance of monetary policy.

— Mario Draghi 2016, Addressing the Causes of Low Interest Rates

One implication of the mismatch between sectors driving employment and sectors driving value added per job is that income inequality has increased and is likely to intensify in coming years.

Introduction

This doctoral thesis consists of three chapters. The first chapter analyzes how the change in the demand composition due to population aging leads a country aging more than its trading partners to have a significant real exchange rate appreciation. It is shown that the quantitative estimates depend crucially on the general equilibrium effect of demographic change on the real interest rate. This effect is specifically analyzed in the second chapter. Calibrating an overlapping generation model for the euro area it is shown that aging exerts a permanent downward pressure on the real interest rate, while only a limited set of structural and policy factors could mitigate this decline. The third chapter considers another force underlying the process of economic growth of advanced economies. It documents that in the process of systematic reallocation of economic activity from the goods sector to the services sector (“structural change”), the relative hourly wage of the services sector decreases constantly over time. An explanation is provided: “skill-biased technical change” leads the relative skill-intensity in the goods sector to increase over time. Abstracts for each chapter follow below.

Demographics and the real exchange rate

with Marta Giagheddu

We propose a general equilibrium two-country, two-sector overlapping generations model to examine the effect of demographic change on the real exchange rate (RER). A higher proportion of elderly in a country raises the relative demand for nontradables which, given imperfect labor mobility between sectors, raises their relative price. A country aging more than its trading partners faces a RER appreciation, partially dampened by the reduction of the global real interest rate. The quantitative results from the model find correspondence empirically entailing that demographics account for 15% of the long-run RER mean absolute deviation for advanced economies.
Demographics and the natural real interest rate: historical and projected paths for the euro area

This paper employs a large-scale overlapping generation (OLG) model quantifying a decrease of the natural real interest rate of about 1.3 percentage points in the euro area between 1990 and 2030 due to demographics alone. Two channels prevail providing the downward impact: the increasing scarcity of effective labor input and the increasing willingness to save by individuals due to longer life expectancy. Mitigating factors are: higher substitutability between labor and capital, higher intertemporal elasticity of substitution in consumption, reforms aiming at increasing the relative productivity of older cohorts, the participation rate and, to a lesser extent, the retirement age. Absent pay-as-you-go pension systems the natural rate would stand at a lower level of about 0.5 percentage points by 2030. The simulated path of the natural real interest rate is consistent with recent econometric estimates: a slight upward trend in the 1970s and 1980s and a marked decline afterward.

Structural skill-biased technical change

A new stylized fact of structural change is documented: in a sample of 11 European economies the hourly wage of the services sector relative to the goods sector has constantly decreased over time in the period 1970-2007. Calibrating a two sector model with high and low skilled workers it is shown that the driver of such a structural change is a “skill-biased technical change” which leads the relative skill-intensity in the goods sector to increase over time. This prediction of the model finds support in the data once the workers’ type of skill is identified according to the level of educational attainment. The new stylized fact holds also for the United States and is reinforced once industries are classified into tradable and nontradable sectors, while the sectoral skill-bias differences are corroborated by measures of job computerization probability.
Bibliography


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