

Impact case study (REF3)

Institution: Birkbeck, University of London
Unit of Assessment: Economics and Econometrics
Title of case study: Demographic structure and economic trends: planning for Europe's financial future
Period when the underpinning research was undertaken: 2012-2019
Period when the claimed impact occurred: 2015 - present
Is this case study continued from a case study submitted in 2014? N
<p>1. Summary of the impact</p> <p>Research by Aksoy and Smith offered new insight into the implications of an aging population for OECD economies, in particular the relationship between aging, innovation and economic slowdown. This work was taken up by central banking organisations worldwide, making an 'influential' contribution to the emergence of demographics as a key policy focus for the sector in recent years (and a topic that is increasingly attracting wider public debate). Organisations which have engaged with Aksoy and Smith's research include the US Federal Reserve, Bank of England, World Bank, the IMF and the OECD, the BIS as well as private financial institutions such as Morgan Stanley and Goldman Sachs. Collaborations with practitioners in the field had direct impact, influencing policy decisions at both the Bank of Spain and the European Central Bank. In Germany, the research has been cited in debates around immigration policy, which has changed in line with Aksoy and Smith's research.</p>
<p>2. Underpinning research</p> <p>Advanced economies are undergoing significant demographic changes: improvements in life expectancy and declining fertility rates have resulted in ageing populations around the world. According to a 2019 OECD report, Fiscal Challenges and Inclusive Growth in Ageing Societies, 'The number of people over 65 for each working-age person will at least double in most G20 countries by 2060'. This is important because age groups differ in their savings behaviour, productivity levels, labour input, contribution to innovation, and investment opportunities. Research by Aksoy and Smith, some of it undertaken in collaboration with Henrique Basso of the Bank of Spain, offers new insight into the specific nature of these differences as well as providing an innovative theoretical model for predicting future trends.</p> <p>A 2012 working paper by Aksoy, Grasl (a Birkbeck PhD student) and Smith [1] sought to empirically quantify the impact of changes in the demographic structure on key macroeconomic variables in advanced economies. They carried out their analysis using a panel vector autoregression of 21 OECD economies over the period between 1970 and 2014, with the panel data variability enabling the identification of direct demographic effects while the dynamic structure uncovered long-term effects. The analysis showed that dependants, both young and old, had a negative economic impact while those of working age contributed positively. An additional study published in 2017 by Aksoy, Smith and Basso [3] explored the relevance of these changes to the UK context in more detail.</p> <p>In a further article published in 2019 [4], Aksoy, Basso, Smith and Grasl proposed a theoretical model that highlighted the relationship between demographics, innovation and growth, whose simulations matched their existing empirical findings. According to this model, the current trend towards population aging and reduced fertility will reduce output growth and real interest rates across OECD countries.</p> <p>Overall, the research shows that aging in advanced economies generates lower growth, lower investment and lower real interest rates. These effects can be traced both to variations in age-related expenditure and savings and, most importantly, to changes in aggregate supply, in particular through a lower rate of innovation, proxied by patent applications (that is to say: older people are less innovative and this has a negative impact on the economy).</p>

This finding is important because it helps to explain why advanced economies can find it difficult to revive economic activity even when interest rates are low.

3. References to the research

1. Aksoy, Yunus, Tobias Grasl and Ron P. Smith (2012). The Economic Impact of Demographic Structure in OECD Countries. *CESifo Working Paper Series* 3960, CESifo Group Munich.
2. Aksoy, Yunus, Henrique S. Basso, Ron P. Smith, and Tobias Grasl (2015) Demographic structure and the macroeconomy. *VoxEU*.
<https://voxeu.org/article/demographic-structure-and-macroeconomy>
3. Aksoy, Yunus, Henrique S. Basso, and Ron P. Smith (2017) Medium-run implications of changing demographic structures for the macro-economy. *National Institute Economic Review* 241 (1), R58-R64. ISSN 00279501.
<https://doi.org/10.1177/002795011724100114>
4. Aksoy, Yunus, Henrique S. Basso, Ron P. Smith, and Tobias Grasl. 2019. Demographic Structure and Macroeconomic Trends. *American Economic Journal: Macroeconomics*, 11 (1): 193-222. DOI: 10.1257/mac.20170114

4. Details of the impact

The United Nations estimates that by 2050, Spain will be the world's oldest country, with 40% of the population aged 60 or above. The insights generated by Aksoy et al's research are therefore particularly significant in the Spanish context: something that has been recognised by the country's central bank. In 2017, Aksoy was invited to spend his sabbatical term at the Banco de España as a visiting fellow in order to pursue his research on demographic trends. During this period, Aksoy worked directly with the bank's research team; for example, preparing the background paper for a talk delivered by their head of research, Dr Juan Francisco Jimeno, to the Spanish Economic Association. A publication with Henrique Basso, a Banco de España economist, also resulted [3].

Aksoy's influence on the bank was direct and considerable. Many internal notes and institutional publications of the Bank of Spain used his results extensively. One of those institutional publications is the bank's 2018 annual report [B], which devoted one of its four total chapters to discussing the 'Economic Consequences of Demographic Change', drawing on Aksoy, Smith and Basso's work extensively throughout. The report also includes further work undertaken at the bank which builds on the findings of the initial research to focus on the Spanish context. This is an ongoing element of the bank's research programme. The question of how to adapt fiscal and social policies to demographic changes is one of the most important policy issues under discussion at the Bank of Spain, and Aksoy's work is mentioned in additional working papers published by its researchers in July 2018 and April 2020 [C, D].

Since Aksoy's residency at the Banco de España, its governor Pablo Hernández de Cos has gone on to present on demographics and the economy to a series of high-profile international audiences and organisations. Papers delivered by de Cos at the International Centre for Monetary and Banking Studies in Geneva, March 2020; to an audience of international policymakers (including representatives from numerous South American central banks) at the Reinventing Bretton Woods conference in Cuzco, Peru in July 2019; to INVERCO, the representative body for Spanish pension funds and collective investment institutions, in 2019; and to the governing board of the Spanish Institute of Actuaries, in January 2020, and all draw on Aksoy's work, demonstrating the extent to which these ideas have become central to the Banco de España's economic outlook. These public presentations were supplemented by additional private and confidential communications on similar subjects.

Both the initial paper and the additional work and publicity given to it by Aksoy's engagement with the Banco de España have led to an increased focus across the central banking sector on the macroeconomic consequences of demographic change. For example, we find Aksoy's research cited at the 2015 Jackson Hole conference in a discussion that anticipates the growing importance of demographic factors to the central banking sector [F].

The extent of this influence is evidenced by the large number of references to Aksoy et al's work in publications by major monetary organisations worldwide, particularly central banks. Over the period between 2015 and 2020, but with increasing frequency in recent years, the research has been cited in briefings and policy papers by organisations including (but not limited to) the Bank of International Settlements, the International Monetary Fund, the European Systemic Risk Board, the Bank of England, the Bank of Finland, the Banca D'Italia, the Banque de France, the Swiss Ministry of Economics, the Asian Development Bank, and the World Bank [see for e.g. G, H, I]. All of these institutions are grappling with the implications of an aging population and in many cases, Aksoy et al's work has been the basis for further specialised research.

Further demonstrating the increasing centrality of demographic changes to global economic debate, Japan during its presidency of the G20 in 2019 listed demographic change as one of its key policy priorities, including the issue in the G20 Leader's Declaration that was published at the close of the 2019 G20 meeting in Osaka. The Population Division of the UN's Department of Economic and Social Affairs [described this inclusion](#) as a 'historic first'. A September 2019 OECD policy paper on 'Fiscal Challenges and Inclusive Growth in Ageing Societies', 'prepared in support of Japan's G20 presidency' and formally approved by the G20 finance deputy, cites Aksoy et al's research [4] in discussing the impact of an ageing society on investment as well as on innovation.

The work of Aksoy and his collaborators has also had a direct impact on the European Central Bank (ECB). Henrique Basso, Aksoy's co-author on papers 2, 3 and 4, who is himself employed at the Banco de España, was in 2017 invited by the European Union to sit on an ECB expert taskforce charged with researching and developing recommendations around the future of pensions schemes in the EU. The economic implications of this work are significant: in 2017, the value of European pensions schemes was EUR1,670,000,000,000 (https://ec.europa.eu/eurostat/statistics-explained/index.php/Ageing_Europe_-_statistics_on_pensions,_income_and_expenditure).

The taskforce drew directly on Aksoy, Smith and Basso's research, deploying their theoretical model to build one of the two projections which formed the foundation for its research and recommendations (made to the monetary policy committee of the ECB) [E, J]. Alongside the central banks, many commercial financial institutions have taken an interest in Aksoy, Smith and Basso's work. Morgan Stanley, Swedbank, Goldman Sachs and CaixaBank all issued client briefings discussing this research and economists for Morgan Stanley drew directly on their research in a paper produced in 2015 and republished by the Bank of International Settlements in 2017 (Pradhan and Goodhart, *Demographics will reverse three multi-decade global trends*, BIS Working Paper No. 656). Aksoy et al's work played a major role in this policy-related study, which was presented at a G30 meeting hosted by the Federal Reserve Bank of New York in November 2017, and whose influence can be tracked through a further series of references made by American federal and international central banks [N].

This work has also acted as a conduit to bring Aksoy et al's research to a more general audience. In 2020, a popular science book by the same authors, *The Great Demographic Reversal*, was published by Palgrave Macmillan; by December 2020, it ranked at #2 in Amazon's 'International Finance' bestsellers chart. This contribution to public debate follows initial press interest in the research, which saw *The Telegraph* run a feature on the publication of paper [3]; demonstrating that the increased prominence of this issue for central banking has begun to see it filter through into the general public sphere.

Impact on immigration policy

Aksoy, Smith and Basso's work has also been invoked in debates around immigration, particularly in Germany, which have now translated into policy changes. One of the implications of the research is the suggestion that immigration policy might provide a way to compensate for the economic implications of an aging population. That is, encouraging well-educated immigrants to enter a society could act as a solution to the slowdown in innovation as a country's native population begins to age.

The president of major think tank CESifo, who is also an economic advisor to the German government, made this point in a 2016 presentation to the German Federal Ministry of Finance [L], including a table from Aksoy et al's article to illustrate the impact of demographics on GDP and drawing on their work to inform his analysis of how German public policy should be adapted to maintain the strength of its public finances. His proposed solutions include the encouragement of skilled migration, a point also made in the German Council of Economic Experts' 2015-16 annual report [M], which again cites Aksoy et al in discussing the relationship between an aging population and inflation and which again concludes that one solution is to bring about 'an influx of young, skilled workers'.

This is a solution that Germany has recently adopted. In December 2018, the country passed a 'skilled labour immigration law', enabling employers in certain sectors of the economy to recruit from outside the EU and granting permission to stay in the country to migrants already in employment. The law came into effect in March 2020.

5. Sources to corroborate the impact

- A. Testimonial from Head of Research, Bank of Spain
- B. Bank of Spain annual report 2018
- C. Henrique Basso and Juan Jimeno (2020), *From secular stagnation to robopocalypse? Implications of demographic and technological changes*, Bank of Spain working paper no. 2004
- D. Henrique Basso and Omar Rachedi (2018), *The young, the old, and the government: Demographics and fiscal multipliers*, Bank of Spain working paper no. 1837
- E. Testimony from Henrique Basso, Bank of Spain
- F. Faust and Leeper (2015), *The Myth of Normal: The Bumpy Story of Inflation and Monetary Policy*. DOI: <http://doi.org/10.13140/RG.2.1.1643.9527>
- G. Ferrero, Gross and Neri (2017), *On secular stagnation and low interest rates: demography matters*. This working paper for the Banca d'Italia 'complement[s] the analysis by Aksoy et al', conducting further work more explicitly focused on the Italian context and suggesting policy changes that 'encourage later retirement and promote innovation'.
- H. Arslanalp, Lee and Rawat (2018), *Demographics and interest rates in Asia*. This working paper for the International Monetary Fund cites Aksoy et al as one of only three references in a discussion of the likely effect of demographic factors on interest rates in the Asian context.
- I. Staatssekretariat für Wirtschaft SECO (2019), *Makroökonomische Effekte des demografischen Wandels – Modellgestützte Projektionen für das langfristige Wachstum der Schweiz*. Working paper for the Swiss State Secretariat for Economic Affairs, which cites Aksoy et al. in offering an analysis of the likely impact of upcoming demographic changes on Swiss economic growth.
- J. Carolin Nerlich (2017), 'The macroeconomic effects of pension reforms', presentation made at a European Central Bank workshop in Vienna on fiscal policy and ageing
- K. Testimony from Morgan Stanley
- L. Powerpoint slides from presentation to German Federal Ministry of Finance, 2016
- M. German Council of Economic Experts 2015-16 Annual Report
- N. American references to Aksoy's work