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# REVISIONS IN POPULATION PROJECTIONS AND THEIR IMPLICATIONS FOR THE GROWTH OF THE MALTESE ECONOMY

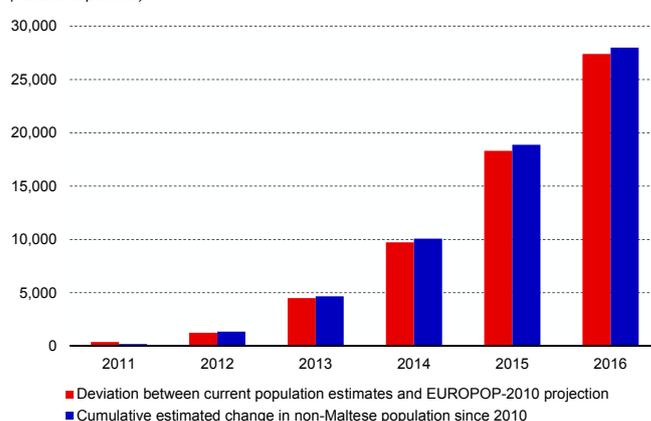
## BOX 2: REVISIONS IN POPULATION PROJECTIONS AND THEIR IMPLICATIONS FOR THE GROWTH OF THE MALTESE ECONOMY<sup>1</sup>

National statistics offices usually focus their limited resources on gathering information on the past and recent periods. The only exception is in the area of demography, where there is a long-standing tradition that population estimates are accompanied with population projections. It is important to note that projections differ from forecasts in that the former are “a conditional calculation showing what the future population would be if a particular set of assumptions were to hold true”.<sup>2</sup> On the other hand, a forecast represents a specific judgement on the validity of the underlying data and assumptions, rather than simply a scenario. In fact, it has become quite common for national statistics offices to present a set of population projections encompassing an array of assumptions on the major determinants, such as the fertility rate, life expectancy and migration. At a time when there have been major fluctuations in important demographic determinants, namely unexpected migration flows and improvements in life expectancy, population projections have tended to influence the appropriateness of policy stances.

### Revisions in population projections for Malta

Since joining the European Union, population projections for Malta have been prepared by Eurostat, in consultation with Malta’s NSO.<sup>3</sup> The first set of projections, published in 2005 had predicted that by 2050 Malta’s population would reach 508,000, constituting the fourth largest increase in the European Union. The latest set of projections, EUROPOP-2015, which was published last year suggests a slight upward revision to 513,000.<sup>4</sup> However over this decade, population projections for Malta have fluctuated significantly. For instance, the EUROPOP-2010 projection had implied a 427,000 population for 2050, or 17% less than the latest projection. This had mainly reflected an assumption of strong outward migration till 2015, followed by very small inflows of migrants thereafter. This assumption turned out to be significantly incorrect by subsequent events. Eurostat (2017), in fact, noted that in 2015, relative to the size of the resident population, Malta had the second-highest rate of immigration (30 immigrants per 1000 persons), six times the EU average.<sup>5</sup> Furthermore, on 12 February 2018, the NSO published a significant benchmark revision in Malta’s population statistics, reflecting methodological

**Chart 1**  
**SOURCE OF DEVIATION OF CURRENT POPULATION ESTIMATES FROM EUROPOP-2010 PROJECTIONS**  
(number of persons)



Source: Authors' calculations using Eurostat and NSO Demographic Review data.

<sup>1</sup> Prepared by Dr Aaron G. Grech, Chief Officer – Economics, and Ian Borg, Senior Expert within the Economic and Research Department. The views expressed are the authors' own and do not necessarily represent those of the Bank.

<sup>2</sup> See George M.V., Smith S.K., Swanson D.A. & Tayman, J., “Population Projections”, in Shyrock, H. S., & Siegel, J. S. (eds.), *The Methods and Materials of Demography*, Washington DC: US Census Bureau (1973). A comprehensive review of population projections methods can be found in an updated version of this publication, published in 2004 by the same editors.

<sup>3</sup> There are other sources of population projections for Malta, notably those made by the United Nations Population Division (see <https://esa.un.org/unpd/wpp/>).

<sup>4</sup> For a technical overview of the Eurostat-2015 projections, see Eurostat, *Summary methodology of the 2015-based population projections*. ([http://ec.europa.eu/eurostat/cache/metadata/Annexes/proj\\_esms\\_an1.pdf](http://ec.europa.eu/eurostat/cache/metadata/Annexes/proj_esms_an1.pdf)).

<sup>5</sup> See [http://ec.europa.eu/eurostat/statistics-explained/index.php/Migration\\_and\\_migrant\\_population\\_statistics#Migration\\_flows](http://ec.europa.eu/eurostat/statistics-explained/index.php/Migration_and_migrant_population_statistics#Migration_flows).

improvements in the compilation of migration flows data for EU and regular Third Country Nationals migrants for the period 2012 to 2016.<sup>6</sup>

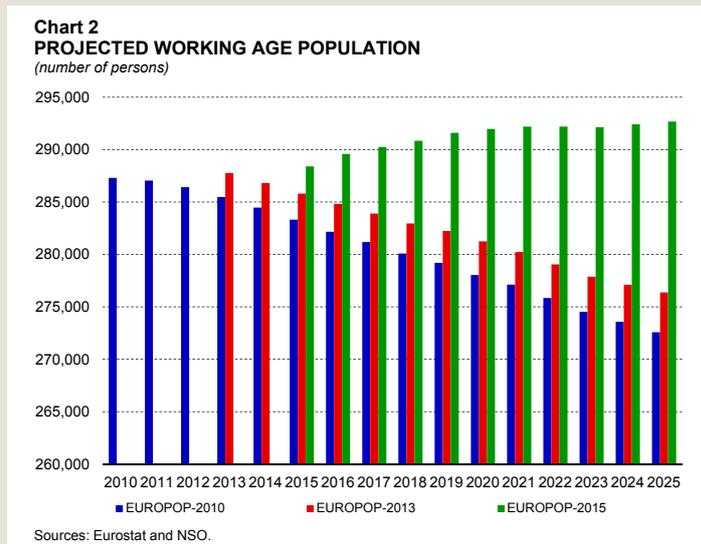
Chart 1 shows that by 2016, the EUROPOP-2010 projection was off the mark by nearly 27,400 persons when compared to the current population estimate for that year, constituting an underestimation of 6.5%. This difference mirrors the growth observed in the non-Maltese population over that time. The two subsequent sets of EUROPOP projections reversed the short-term assumption of net outward migration, such that the latest set of projections assumes an average net immigration of nearly 2,600 each year till 2025.

Such abrupt reversals in assumptions used in population projections are not uncommon, even for larger countries. For instance, Office for National Statistics (2016)<sup>7</sup> documents how UK projections made in the mid-1950s failed to foresee the 1960s baby boom, producing an estimate for 1995 that was five million below the actual figure. By contrast the projections made in the 1960s projected that the spike in fertility would continue, leading to a projection for 2001 that proved to be 16 million over the actual estimate for that year.

In the case of small countries, changes in assumptions can have very dramatic implications. EUROPOP-2010 showed Luxembourg's population at 0.6 million in 2030. EUROPOP-2015 now indicates that this level will be reached before 2020, and that by 2030 it will be nearly a third higher than envisaged in the projections made five years earlier.

Returning to the Maltese population case, the EUROPOP-2015 projection outlines a scenario where total population is expected to continue to grow rapidly over the next 20 to 25 years. Total population growth between 2015 and 2025 was projected at around 0.5% on average in EUROPOP-2010, whereas in the latest projections this has been revised upwards to 0.9%. In terms of persons, the upward revision in population growth means that total population by 2025 is estimated to be 24,000, or 5.4%, higher than previously projected. Compared to EUROPOP-2010, the upward revision is of around 38,000 persons, or 8.8%. In fact, the population projection which EUROPOP-2010 had for 2025 had already been reached in 2016 due to the high migration flows of recent years.

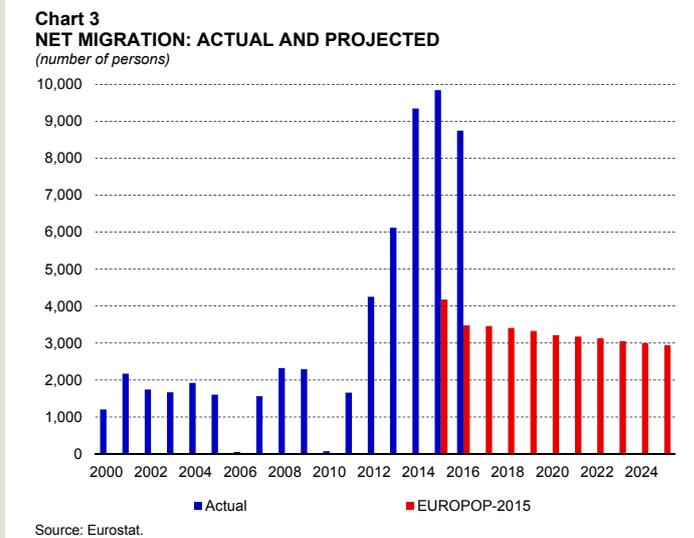
Chart 2 shows the projected working age population (15-64) for the period 2010 to 2025 implied by the three most recent set of EUROPOP projections. Both EUROPOP-2010 and EUROPOP-2013 had shown a declining path for the potential labour supply.



<sup>6</sup> See National Statistics Office (2018), *Population Statistics (Revisions): 2012-2016*, Press Release 022/2018.

<sup>7</sup> See Office for National Statistics (2016), *National population projections accuracy report*. (<https://www.ons.gov.uk/file?uri=/peoplepopulationandcommunity/populationandmigration/populationprojections/methodologies/nationalpopulationprojectionsaccuracyreport/uknppaccuracyreport2015tcm774127221.pdf>).

By 2016, EUROPOP-2010 had implied a decline of 5,140, or 1.8%, in Malta's working age population, while EUROPOP-2013 showed a 2,941, or 1%, fall. In actual fact, the working age population grew by 2,464, or 0.9%, between 2010 and 2016. EUROPOP-2015, taking account of this trend, shows a slightly rising profile for this variable, with an implied growth of 3,089 persons, or 1.1%, by 2025. Compared with EUROPOP-2010, the working age population in 2025 is now expected to be nearly 20,100 persons higher, or 7.4% above the projection made five years earlier.



While this upward revision represents a break from the previous rounds of projections, at 0.9%, the projected annual average rate of growth for the next decade is well below the 1.3% annual average seen over the last ten years. It is important to note that the EUROPOP-2015 projection was finalised before the benchmark revision in migration flows was published in 2018. In fact, EUROPOP-2015 is already underestimating the working age population in the second year of the projection, by nearly 18,400 persons or 6.0%. Net migration in 2016 was 8,748, or two and a half times the EUROPOP-2015 assumption. Nevertheless, while migration in recent years was quite significant, the EUROPOP-2015 migration assumption compares well with flows seen over the medium term (see Chart 3).

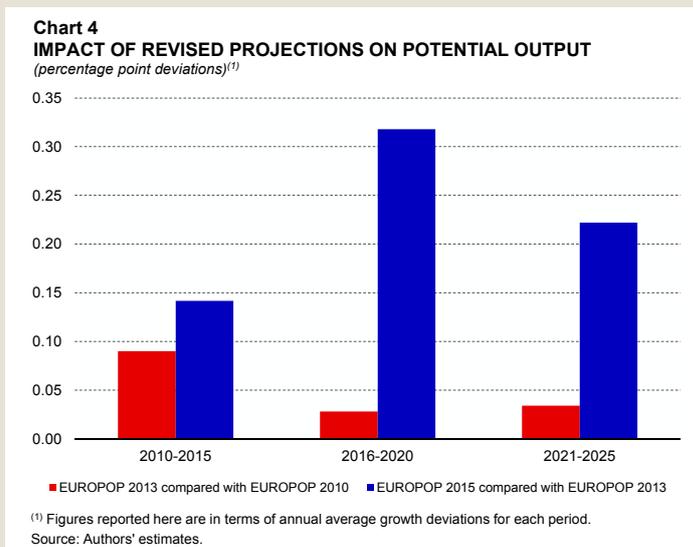
### The impact of revisions in population projections for Malta's potential growth

Domestic output essentially depends on three main factor inputs, namely, capital, labour, and total factor productivity. Capital stock is a function of investment flows, while total factor productivity refers to the portion of output unexplained by changes in the amount of labour and capital. The labour component is a function of the working age population, hours worked, the participation rate, and a measure of structural employment. Population projections are therefore crucial to the estimation of both historical and future developments in supply, and hence, revised population projections have a direct impact on this estimate.

In this section we estimate the impact that these revisions in population had on Malta's potential output growth over the period 2010-2025, by applying the different working age population projections corresponding respectively to the EUROPOP-2010, 2013, and 2015 vintages. EUROPOP-2015 includes three scenarios: low migration, baseline projections and high migration. In the first part of this section we will use the baseline projections, providing some sensitivity with the different scenarios later on. All other variables, excluding the working age population, are kept constant across the three estimations in order to isolate the impact of working age population projection vintages.<sup>8</sup>

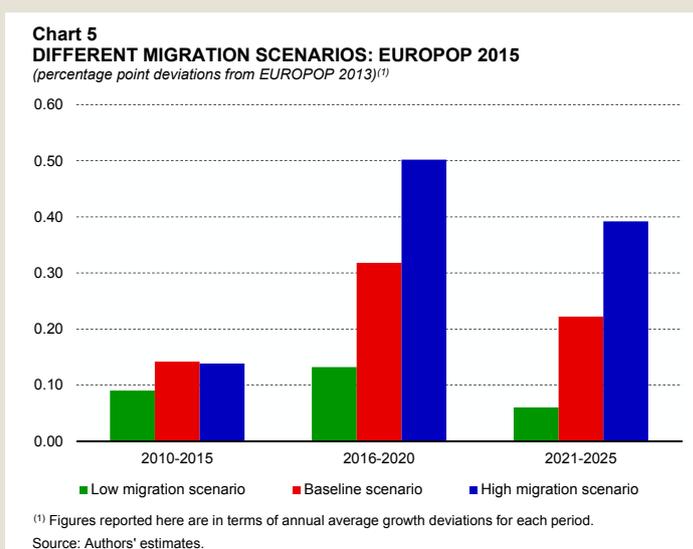
<sup>8</sup> The assumptions utilised in this study are derived directly from Micallef, B., & Ellul, R., "Medium-term Estimates of Potential Output Growth in Malta", in Grech, A. G., & Zerafa, S. (eds.), *Challenges and Opportunities of Sustainable Economic Growth in Malta: the Case of Malta*, Central Bank of Malta, 2017. <https://www.centralbankmalta.org/books>.

Chart 4 shows the average impact of the different vintages of population projections on potential output growth, in three different periods.<sup>9</sup> In each case, working age population projections were revised upward, and hence each new projection vintage implies an upward revision to potential output growth. When comparing the EUROPOP-2013 projection with EUROPOP-2010, the largest positive impact occurred in the period 2010-2015, primarily driven by strong upward revisions in the working age population estimates of 2012 and 2013. During this period, the impact of the revised projections stood on average at around 0.09 percentage point. Going forward however, the impact of EUROPOP-2013 working age projections was marginal and at around 0.03 percentage point on average, for both the 2016-2020 and 2021-2025 periods.



The largest impact on potential output growth occurred with the release of EUROPOP-2015, which revised upwards substantially net migrant flows. On average, the impact for the period 2010-2015 stands at around 0.14 percentage point, driven in large part by a significant acceleration in net migrant flows during 2015. The peak impact is attained for the period 2016-2020, which implies an upward revision in potential output growth of around 0.32 percentage point. With regard to the medium-term impact of the latest population projections, this stands at around 0.22 percentage point for the period 2021-2025.

EUROPOP-2015 includes three migrant scenarios in order to cater for the fact that net migrant flow projections have become the main source of error in population projections. Chart 5 plots the impact on potential output growth according to different scenarios of migrant flows, compared to EUROPOP 2013. The potential output impact of the low migrant scenario is quite small, peaking at around an average of 0.13% in the period 2016-2020, which is less than half the estimated



<sup>9</sup> The impacts presented in this Section are defined as the annual average growth deviations related to the different periods. For example: an average of 0.1 percentage point deviation for the period 2016-2020 implies a cumulative impact of 0.5 percentage point.

impact derived from the baseline scenario. Moreover, the high migrant scenario peak impact in the period 2016-2020 averages at around 0.50%, while for the period 2021-2025 the potential output growth impact stands at an average of around 0.39%.<sup>10</sup>

Previous studies have utilised EUROPOP-2013 projections to estimate potential output growth. These studies projected on average medium-term potential output growth of around 3.25% for the period 2021-2025, which is 1% less than the period 2016-2020.<sup>11</sup> The estimated impacts shown in Charts 4 and 5 imply that potential output growth for the period 2016-2020 should be revised up to a range of between 4.4% to 4.8%, while for the period 2021-2025 should be closer to a range of between 3.3% to 3.6%.

### **Conclusion and policy recommendations**

Population projections are surrounded by considerable uncertainty since these depend on a number of assumptions to hold true for a considerably long period of time into the future. As a result, these tend to be revised significantly across different projection vintages. For the case of Malta, whereas in both EUROPOP-2010 and EUROPOP-2013 Malta's working age population was expected to fall due to the effects of an ageing population, the latest EUROPOP-2015 projections outline a scenario whereby this is expected to continue growing at steady rates over the next seven years. This implies a further boost to Malta's potential output growth of between 0.3% to 0.5% for the period 2016-2020, and 0.2% to 0.4% for the period 2021-2025. Note, however, that these estimates are based on the assumption that migrant workers, which constitute the bulk of the upward revision implied in the EUROPOP-2015 projection, have the same productivity and employment patterns as locals. Grech (2017), on the other hand suggests that migrant workers tend to be more concentrated in the managerial and professional category and work in high-valued services.<sup>12</sup> This may mean that the estimates presented here underestimate the potential impact of higher numbers of foreign workers. Furthermore, as was already hinted earlier, the EUROPOP-2015 projection is based on relatively conservative assumptions on future migration when compared to the revised data on recent migration flows published by the NSO.

On the other hand, while the rise in potential output growth is welcome, the increase in population growth poses a number of challenges for the Maltese economy. Firstly, the increase in population is likely to add additional stress on infrastructure, which could negatively affect potential output growth in the absence of adequate investment. Furthermore the steep rise in the share of non-Maltese population in the labour supply might add cyclicalities in potential output, as foreign workers may be more prone to leave the country in the face of negative economic shocks.<sup>13</sup> These two factors suggest the importance for considerable investment in infrastructure over the coming years, together with additional efforts to further upskill the local workforce to enable it to better accommodate the needs of a Maltese economy diversifying its activity into new sectors. It will also be important to maintain the flexibility achieved in recent years in the labour market, possibly with policies targeted at increasing the employment rates of older workers. That said, the increased degree of reliance on migrant workers also implies that firms will need to get used to higher rates of labour turnover, which could create challenges to maintain and improve productivity. Outlays on training and organisational structures will need to be strengthened.

<sup>10</sup> Note that EUROPOP-2015's high migrant scenario still implies a net migration assumption which would be approximately half the net migration observed since 2014.

<sup>11</sup> See Micallef, B., & Ellul, R., "Medium-term Estimates of Potential Output Growth in Malta", in Grech, A. G., & Zerafa, S. (eds.), *Challenges and Opportunities of Sustainable Economic Growth in Malta: the Case of Malta*, Central Bank of Malta, 2017. <https://www.centralbankmalta.org/books>.

<sup>12</sup> See Grech, A. G. (2017), "Did Malta's accession to the EU raise its potential output? A focus on the foreign workforce", *Journal of Economic Integration* 32(4), pp. 873-890.

<sup>13</sup> Recently published migration flow data also suggest a significant churn in the migrant population even during a period of strong economic growth. For instance the number of non-Maltese EU citizens emigrating from Malta more than doubled between 2012 and 2016, while the number of Third Country Nationals emigrating from Malta tripled during the same period.