

## Scenarios of Future Population Growth and Change in Singapore

### IPS Demography and Family Cluster

Dr Yap Mui Teng, Senior Research Fellow

Dr Kang Soon Hock, Research Fellow

Chua Chun Ser, Research Assistant

### **Background**

Recently, there has been concern over immigration and the decline in Singapore's Total Fertility Rate (TFR) among both policy makers and the public. The IPS Demography and Family cluster embarked on a project in 2007 to study scenarios of future population growth and changes in Singapore. This article highlights some of the project's findings.

This article asks two questions:

- 1) what would the future population of Singapore be like if the Total Fertility Rate (TFR) remains extremely low over the long term; and
- 2) what would be the likely impact of raising the TFR versus increasing immigration on the future population of Singapore.

Using projections from the IPS project, this article highlights four possible population scenarios for Singapore over the period 2005-2050 derived from different assumptions about future fertility and migration trends described below<sup>1</sup>. Mortality assumptions are common for all four scenarios. These are represented by life expectancy at birth which is assumed to rise from 77.4 years in 2005 to 79.7 years in 2050 for males, and from 81.3 to 84.6 years over the same period for females. The base population used is the resident population of Singapore in 2005.

### **Scenarios**

- 1) TFR remains at 1.24 births per woman and there is zero net migration throughout the projection period (Constant Low Fertility, Closed Population).
- 2) TFR remains at 1.24 births per woman and 30,000 net migrants are added annually throughout the projection period (Constant Low Fertility, Low Migration).

<sup>1</sup> The Demography and Family Cluster at IPS acknowledges the contributions of Dr. G. Shantakumar and Ms. Hazel Macadangdang in generating the population projections used in this article. The information presented here are part of a set of 48 scenarios generated. Dr Shantakumar is a Statistician/Demographer who has retired after serving as Associate Professor in the Department of Economics, National University of Singapore. Ms Macadangdang worked under the supervision of Dr Shantakumar.

- 3) TFR remains at 1.24 births per woman and 60,000 net migrants are added annually throughout the projection period (Constant Low Fertility, Medium Migration).
- 4) TFR rises gradually from 1.24 to 1.85 births per woman by 2025 before stabilizing at this level and there is zero net migration throughout the projection period (Rising Fertility, Closed Population).

The TFR of 1.24 births per woman used in these projections was the reported figure for 2005, as published by the Department of Statistics at the time the projections were made in 2007. While preliminary data for 2010 show that the TFR has fallen to 1.16, we believe that this is likely to be a temporary phenomenon and that the TFR will rise above this level following economic recovery, and may also increase with the arrival of more auspicious years for births according to the Chinese zodiac. It may be noted that the TFR for 2008, the year in which Singapore began to feel the effect of the global financial crisis, was 1.22 births per woman. On the other hand, we also do not expect the TFR to return to the replacement level of 2.1 births per woman.

We have also chosen to present the scenarios reflecting net-migration levels of 30,000 and 60,000 in this article as they approximate recent developments in in-migration. The figure of 30,000 net-migrants approximates the number of foreigners given permanent resident status around the early 2000s. Interestingly, nearly 60,000 foreigners became new permanent residents in Singapore in 2009. As citizenship is typically conferred after permanent residency, it would be inappropriate to add the number of new citizens to these counts.

The results presented below show future outcomes if conditions stated in the assumptions hold true. The actual situation may differ from the projections.

### ***Population Size and Growth Trends***

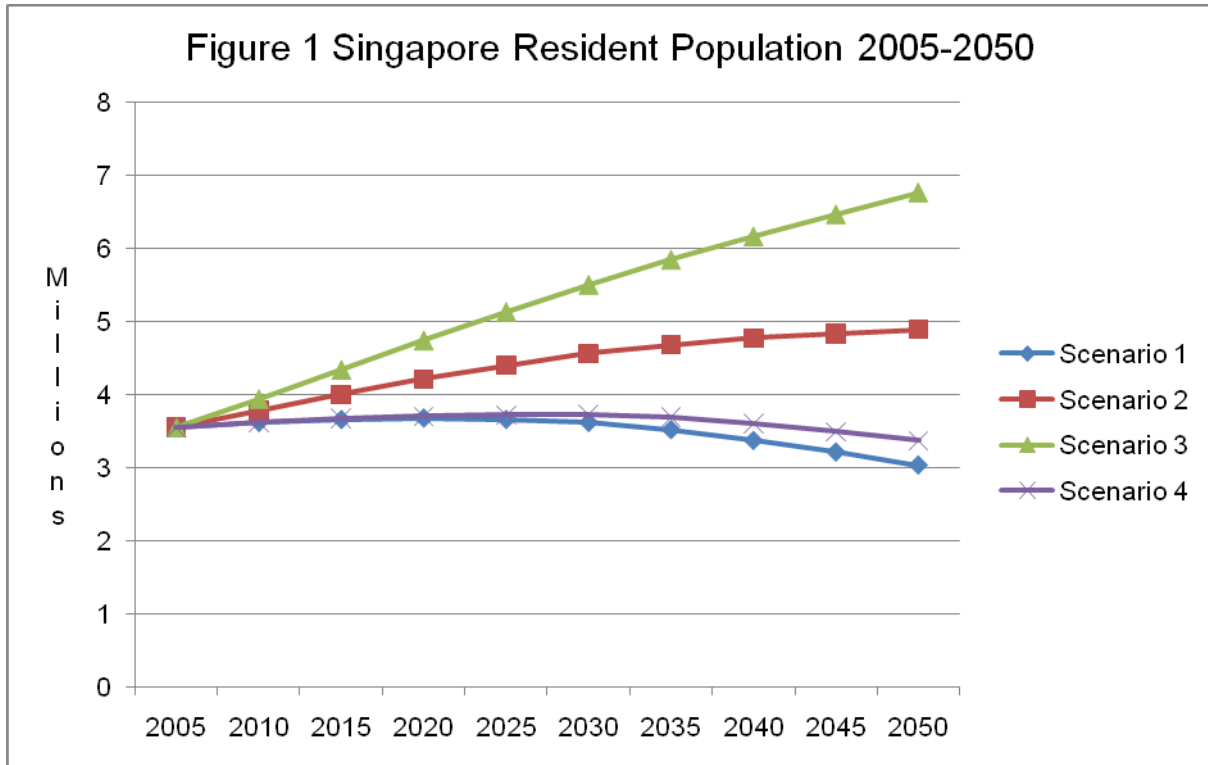
Figure 1 summarises the outcomes of the four projections with regard to population growth and sizes.

Under Scenario 1, the total resident population of Singapore is projected to grow from 3.55 million in 2005 to about 3.68 million in 2020 before declining to 3.52 million in 2035 and 3.03 million in 2050. The growth in the population beyond 2005 is due to population momentum. The number of babies born and thus added to the population will continue to exceed the number of people dying and exiting the population for some time due to the age-structure of the population. This excess of births over deaths will cease as fewer young people enter the reproductive ages and the number of deaths increase as the population ages.

If 30,000 net migrants are added annually and these reproduce at the same rate as the local population (Scenario 2), the total resident population can be expected to rise throughout the projection period, from 3.55 in 2005 to about 4.89 million in 2050.

The resident population is projected to grow further to 6.76 million in 2050 if 60,000 net migrants are added annually and these migrants reproduce at the same rate as the local population (Scenario 3).

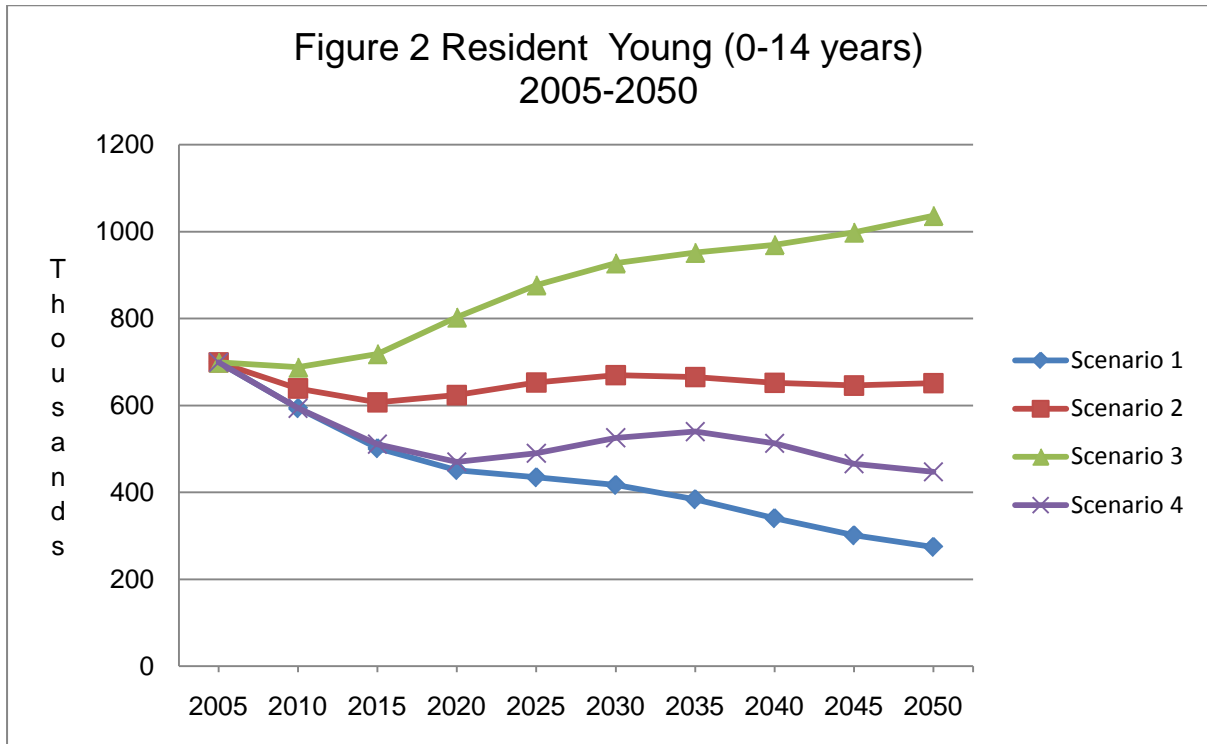
However, if only the TFR is raised and the population is closed to migration (Scenario 4), the resident population will peak at 3.73 million in 2030 before declining to 3.37 million in 2050.



### Changes in Age Structure

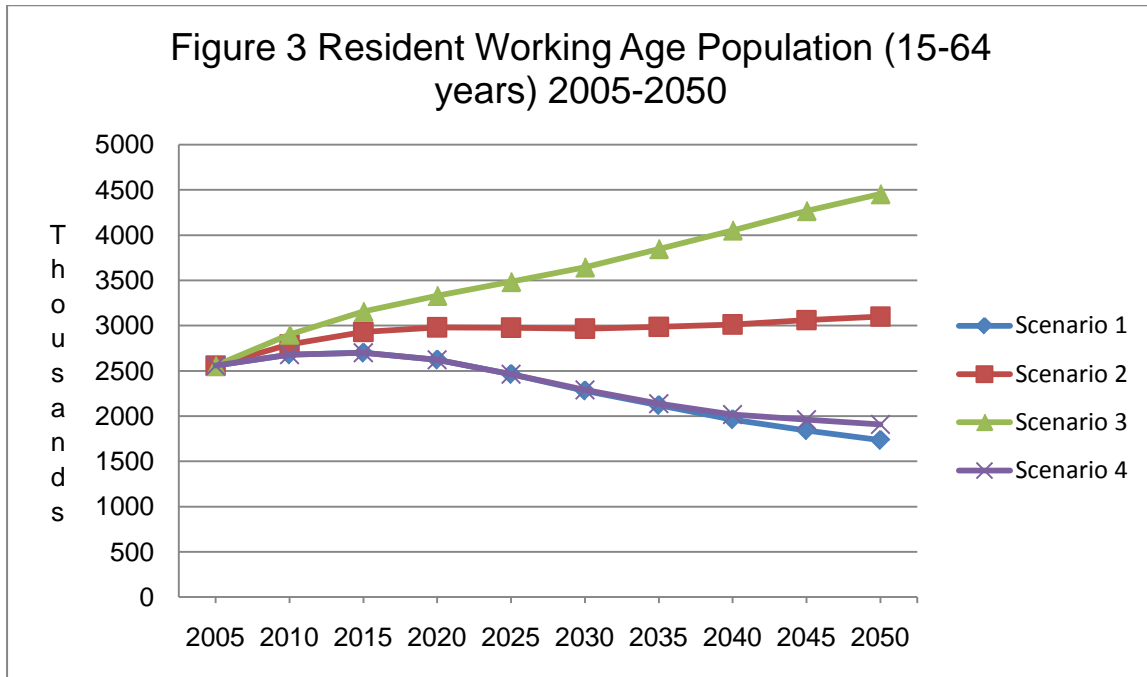
#### a) The Young (ages 0-14 years)

Figure 2 shows that under Scenario 1, the number of the young aged 0-14 years is likely to decline from 699,000 in 2005 to less than half this size, at 274,400, by 2050. Under Scenario 2, however, the number of the young in 2050 will be slightly lower than in 2005, at about 650,000. Scenario 3 vastly increases the population of the young to 1.04 million in 2050. The population of the young in Scenario 4, like in Scenario 1, is projected to decline but the drop will be less dramatic.



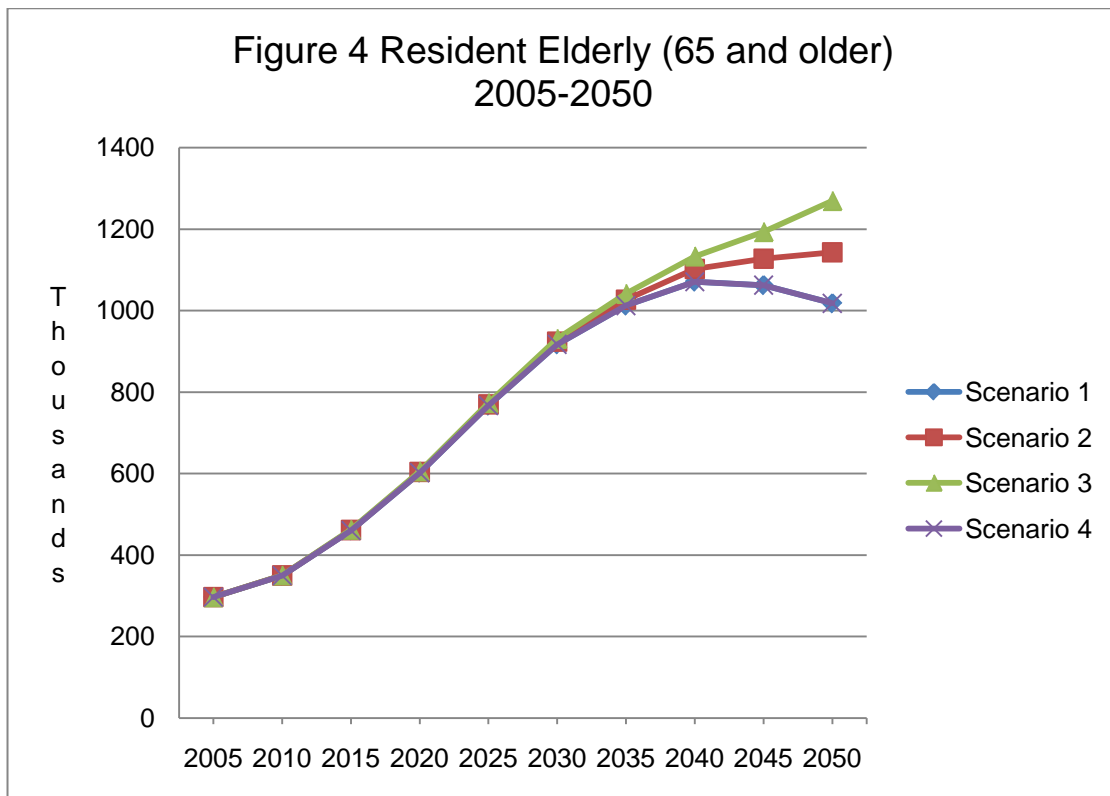
b) Working Age Population (ages 15-64 years)

Figure 3 shows the changes in the size of the working age population under the various scenarios. Under Scenario 1, the working age population is projected to decline from 2.56 million in 2005 to 1.73 million in 2050 after peaking at about 2.7 million in 2015. In comparison, under Scenario 2, the working age population would increase gradually over the entire period, rising to nearly 3.1 million in 2050. Not unexpectedly, the growth in this population segment is much higher under Scenario 3, reaching nearly 4.5 million in 2050. The effect of raising the TFR alone and closing the population to immigration (Scenario 4) adds little to the growth of the working age population compared to Scenario 1.



c) Elderly (ages 65 and over)

Figure 4 shows that there is not much difference in the number of the elderly regardless of scenarios until after 2030. This is because up until then, the future elderly are already born and existing in the population. It is only after 2030 when the results of in-migration will be felt.



## **Conclusion**

The level of net migration has an important effect on the overall levels of population growth and the numbers of the young and the working age population. In the different scenarios, an increase in net migrants would have a more direct and substantial effect in increasing population numbers and the working age population than an increase in the TFR alone.

This article has focused only on the numerical outcomes of the projections. Analysis of the implications of these changes in terms of dependency and support ratios and the like will follow in a subsequent article.

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