

## **ESEE Conference Leeds 2015**

### **The Population Variable in Resource Economics**

#### **Extended Abstract**

This paper presents the conclusions of four research projects commissioned and supervised by the author as Masters' student dissertations. All draw a common conclusion - that population growth in the UK and globally exacerbates economic, environmental and resource problems. Specifically:

- a) Population growth impacts negatively on housing availability, food security and the natural environment.
- b) Far from being essential to meet the needs of the 'unaffordable' ageing population, each additional young person requires 16% more public expenditure than an additional old person.
- c) Reducing future energy demand by reducing unwanted births is 60% more cost-effective per tonne of carbon abated than other offset schemes.
- d) Population growth increases the gap between notional GDP growth and real increases (if any) in average incomes.

#### **a) Population, Housing, and Land-take**

This report examines the historical facts about housing problems in the past 20 years. The population of England in 1994 was 48.23 million; of whom 125,360 households were 'statutory homeless'. If the population had been stabilized at that point, then:

- ♦ With a house density of 24 dwellings per hectare, 5223 hectares of land would have been required to house all the homeless population in 1994.
- ♦ The area of brownfield land actually changed to residential use in 1994 and 1995 would have been sufficient for the construction of 153,900 new dwellings.
- ♦ So housing demand from homeless people could have been met by the end of 1995 with no greenfield land-take.

In practice, because of rapid population growth since then, 26,455 hectares of farmland producing £63 million worth of agriculture outputs, have been lost to housing; as have 3610 hectares of greenbelt amenity land. Meanwhile, despite continuous house-building, homelessness remains acute; and house price inflation, arising from excess of demand over supply, continues. Looking ahead, local authorities' plans to 2050 anticipate that 700,000 houses will be built in the countryside, including almost 200,000 in the greenbelts.

## **b) The 'Ageing Crisis' in perspective**

This paper puts into perspective current concerns about the unaffordability of the UK's ageing population, often used as an argument for stimulating population growth in order to inject into society more young people (who will grow old in turn and need yet more young people – a proposal described by Sir David Attenborough as a 'Ponzi scheme').

This project aims, therefore, to compare the cost to central and local government of a single child from conception to the start of employment/tax-paying with the cost of an old person from retirement to death. The authors include nine factors to estimate the cost of rearing a child and four factors to measure the cost of an old person. The factors used for a child include healthcare, education, childcare, child benefit, child tax credit, cost during pregnancy, tax loss of parents, social housing and unemployment.

Factors examined for the cost of an old person include healthcare, social services, social housing and pension. From the results of our model, we find the average total public cost of a child is £261,198. And the average total public cost of an old person is £224,596. The public cost of an additional old person from retirement to death is thus about 16% lower than the public cost of an additional child from conception to the age of employment/tax-paying. The factors Education and Child Tax Credit mainly dominate the costs of raising a child, while pension and healthcare dominate the public cost of an old person.

## **c) Future Population and CO2 Emissions: Demand Reduction**

Fewer people clearly emit fewer tonnes of CO<sub>2</sub> at any average level of energy consumption; and reducing future energy demand, through family planning and female education to reduce the number of unwanted births, is precisely equivalent to increasing future low-carbon energy supply in terms of emissions abatement. This project compares the economic costs of the two approaches. It analyses family planning performance in three countries, Nigeria, Pakistan and Philippines, and compares the results with other offsetting schemes.

The study found that the average mitigation potential of family planning is equal to 3.23 US dollars per tonne of abated CO<sub>2</sub> emissions, which is 60% lower than average cost of alternative energy and forestry options, and thus practically cost-

competitive. It should, however, be further analysed in combination with female education; and the author recommends incorporating the level of female education in the Spectrum modeling software.

The project was commissioned by PopOffsets – the only carbon offset project in the world that enables individuals and organizations to offset their carbon footprint by funding family planning.

#### **d) Population growth, GDP and GDP per capita.**

This report compares UK GDP per capita development in real terms with changes in national GDP; relates these to population growth; and contrasts the forecasts to 2030 for the UK, Germany and Kenya.

Although real UK GDP per capita increased between 1991 and 2007, it decreased drastically from 2007 to 2009 by 14.6% annually. Since 2009, it has remained constant. Forecast data suggest that the real GDP per capita will remain at its current level until 2030 because population increase and inflation will offset nominal economic growth. We found that a 1% increase in population growth leads to a 1.15% decrease in real GDP per capita growth.

In the UK and Germany, with relatively low population growth, real GDP per capita developed at roughly the same rate as real GDP since 1991. In Kenya, however, real GDP increased strongly by 1.6% p.a. from 1991-2013, while real GDP per capita decreased by 1.1% p.a. because of population growth at up to 3.3% p.a. This underlines the important relation of GDP growth with population growth: whenever population growth exceeds GDP growth, GDP per capita decreases and vice versa.

Looking ahead to 2030, the population forecasts for the UK and Germany diverge. Since 1991, the UK population has grown by over 7 million people (c0.7% pa), and the Office for National Statistics expects this trend to continue in coming decades. Their scenarios to 2030 are: with low growth, the population will increase by 5 million people; with medium growth, by 6.9 million people; and with high growth, by 9 million people. In contrast, German growth is substantially lower. Since 2003, the German population has decreased by 1.9 million people (-0.3% p.a.), and this trend is expected to continue. The German scenarios to 2030 are: low 'growth', a decrease of 3.5 million people; medium 'growth', a decrease of 700K people; high growth, an increase 1.9M people. Thus even with high growth, the German population increases less than does the UK with its lowest growth. Consequently, German GDP per capita continues to grow over the period, while in the UK it flat-lines.

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