

Ageing and Sustainability

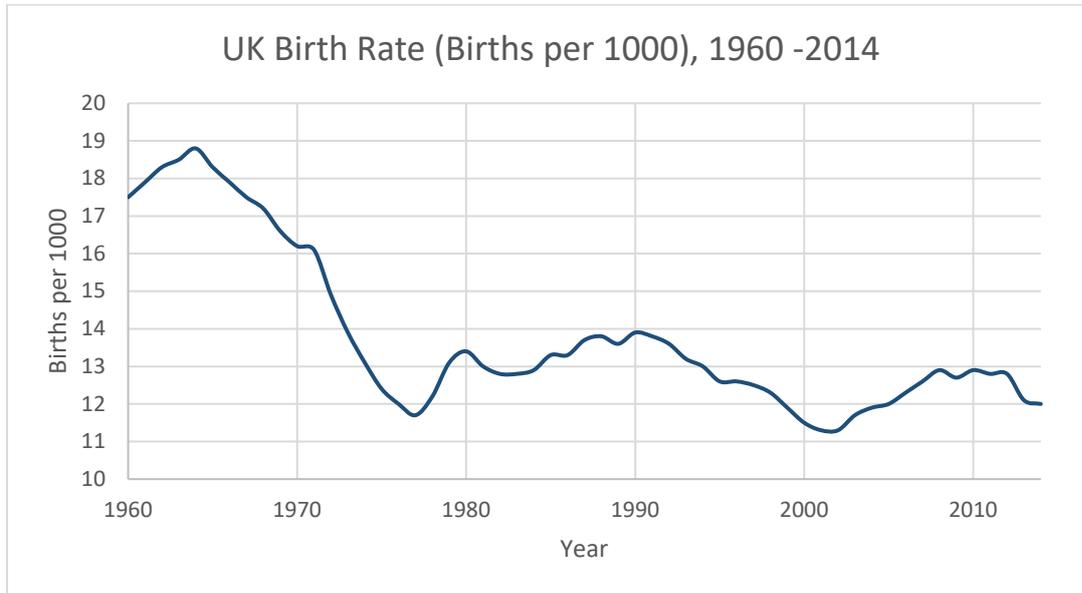
Oliver Ramsey

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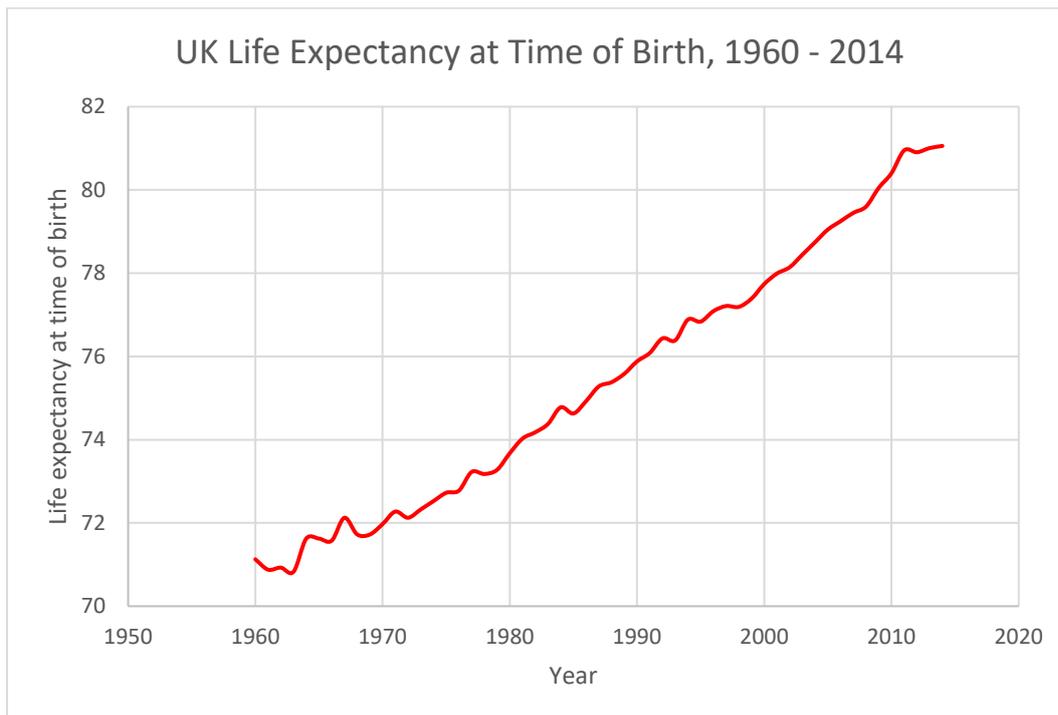
Throughout this report we shall analyse some of the most prominent effects of population ageing on the UK economy. The intention is to consider how the British government might aid economic sustainability, with respect to our current pension system and other key state institutions. We shall begin by assessing the current state of the world – assessing the extent of ageing, the current role of government in caring for the elderly and, finally, the economic climate. This shall allow for a holistic understanding of why we find ourselves in this situation and what the immediate future may hold. In the later part of the report, we shall model aspects of our economy, discussing how ageing might impact them, before considering appropriate action that the government might take to encourage resilience. Modelling take the form of System Thinking, with wellbeing as the central actor – the causal relationships between variables are built on data or published academic thought. The result of this analysis shows that, without significant reform, the state sector shall suffer significantly, however many of these changes can be made at the household level. There are changes to be made by the government, although the wellbeing of our aged is in the hands of those closest to them.

1.1 UK Age Dynamics

It is no secret that that population ageing is an escalating problem. Extending life expectancy paired with declining birth rates is leading to a warped age profile within the UK population.



¹Figure 1



²Figure 2

¹ World Data Bank, (2016). *Birth rate, crude (per 1,000 people)*. [online] Available at: <http://data.worldbank.org/indicator/SP.DYN.CBRT.IN?end=2014&locations=GB&start=1960&view=chart> [Accessed 19 Jul. 2016]

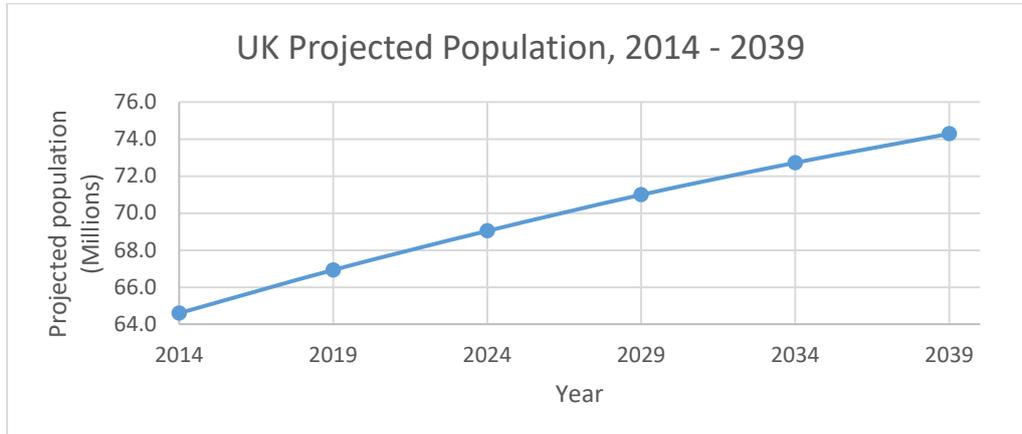
² World Data Bank, (2016). *Life expectancy at birth, total (years)*. [online] Available at: <http://data.worldbank.org/indicator/SP.DYN.LE00.IN?end=2014&locations=GB&start=1960&view=chart> [Accessed 19 Jul. 2016]

These charts provide empirical evidence to the claims made in the introductory statement. The increase in human longevity is simple to explain – we see improvements in medical technology and innovation every day. Newer medicines and treatment methods allow people to be kept in good health and hence we see death rates fall. Health and wellbeing is being publicised more and more in the media and through educational schemes; this alongside the effective medical treatment has led to shocking statistic that life expectancy is growing on average 7 hours per day [taken by an approximation of the gradient of Figure 2, using points 1999 and 2011].

One could make the argument that declining birth rates are the result of a cultural change. Contraception is becoming more widely used by both secular and religious communities – this indicates a desire to limit the number of children that couples are producing, as well as the selection of *when* to have children. It has been estimated that the average age at which a mother produces her first child was 25 in 2006, a serious change from the estimate of 21.4 in 1970³ and this trend is continually rising. There is a far greater proportion of women who are pursuing careers in their early working lives⁴, rather than committing themselves to parenting and this positive movement in gender equality has the bi-product of fewer children.

It is also worth highlight that the economic tumult experience in the western world over the past decade has instilled a lack of confidence in the population, and this translates into hesitance over having children⁵. Couple seek a greater level of comfort and financial security before choosing to produce, hence delaying the process and slowing birth rates.

The result of these drivers is a population which is growing with a greater weighting towards the older generation. These graphs illustrate the projected changes that we may experience.



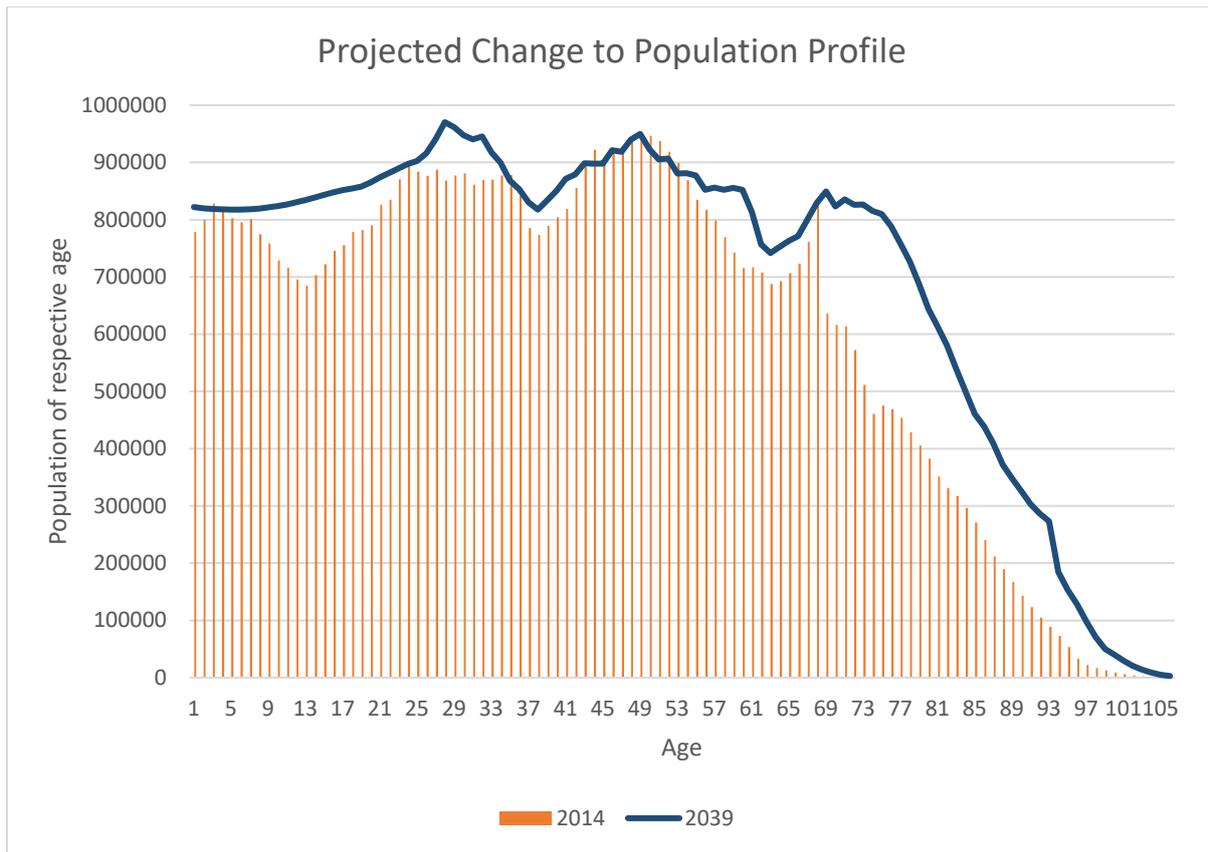
⁶Figure 3

³ Mathews, TJ. and Hamilton, BE. (2009). *Delayed Childbearing: More Women Are Having Their First Child Later in Life*. NCHS Data Brief, No. 21, Page 1.

⁴ World Data Bank, (2016). *Labour force, female (% of total labour force)*. [online] Available at: <http://data.worldbank.org/indicator/SL.TLF.TOTL.FE.ZS?locations=GB> [Accessed 19 Jul. 2016].

⁵ Sobotka, T. et. al. (2011). *Economic Recession and Fertility in the Developed World*. Population and Development Review, Vol. 37.

⁶ Office for National Statistics, (2015). *National Population Projections: 2014-based Statistical Bulletin*. [online] Available at: <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/bulletins/nationalpopulationprojections/2015-10-29> [Accessed 21 Jul. 2016]



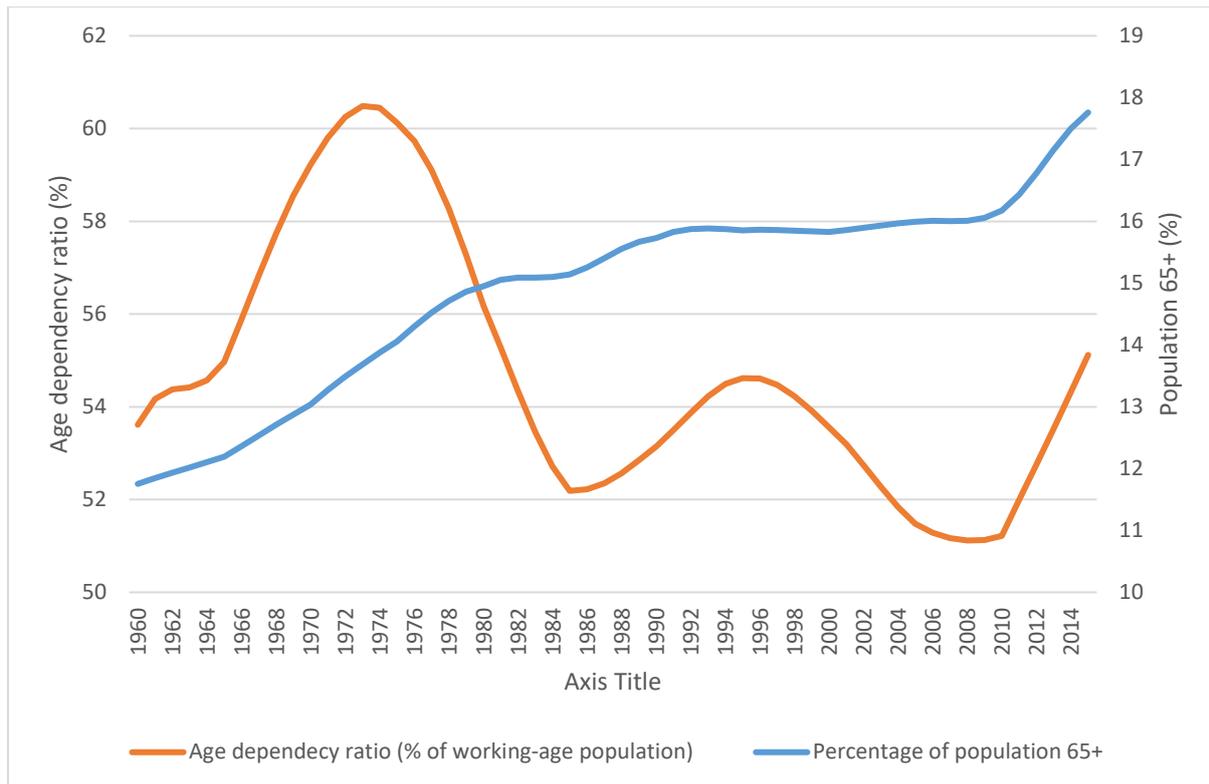
⁶Figure 4

The UK population has already breached 65,000,000 and the Office for National Statistics estimates that we will continue to see growth of on average 300,000-400,000 people per year. Figure 4 illustrates the projected population profile. It is clear that there are two key areas in which we expect to see a rise in population by 2039.

The first is ages 7-24 – these figures are based on predicted birth rates since anyone younger than 25 would not have been born in 2014, so one could argue that these points may not be quite as reliable. For those older than 25, however, estimates should be more accurate since this is based on current factual data.

A concerning property of this graph is that beyond the age of 68 we see a large bulge in the predicted figures, meaning a far greater proportion of aged individuals. Importantly, by the current laws, these people are of retirement age. Under our current pension system - which will be discussed more later – they will be entitled to state benefit, meaning far greater liabilities for our national budget.

Another vital characteristic of this projection is that we see little-to-no change in population size of the 25-68 bracket. These individuals are the key contributors to the work force and in theory will be skilled workers whom produce the greatest output for the UK and world economy. With growth in the number of state-dependent individuals and no growth in the demographic of workers who will pay the greatest proportion of tax to the state, we see the situation get more difficult. What we are considering here is the number of dependent individuals per working individual: the *dependency ratio*.



^{7,8}Figure 5 - Age dependency ration and percentage of workers 65+

We see here the recent changes in age-dependency ratios and the proportion of the population who are 65 or older. The age-dependency ratio fell significantly from 1974-1985, likely due to the *baby-boomers* reaching a working age. The ratio remained relatively low until 2010 but we are seeing an increase now, and from the graphs above we will expect to see this rise again for a significant period. The percentage of individuals older than 65 can also be seen to be increasing significantly, and again we expect it to rise further.

1.2 The Current Pension System

It is important to understand how our state pension system functions so that later we can assess the situation, and eventually consider our future prospects. At the moment we follow a *pay as you go* method of social security, meaning that the current pensions are paid for by the current tax payers and eventually the current work force will have their pensions paid for by the future work force.

The state pension was introduced in the UK in 1909, consisting 5 shillings per week (£24 by today's standard using CPI estimates) or 7s.6d per week (£35 today) for married couples. The qualifying age was 70 with a maximum income of £31.10s per annum (£3000 today). This was introduced to combat the poverty that was rife during and immediately after the Victorian era. Approximately half a million people were granted the benefit in 1909⁹. This was one of the major movements made by the British Liberal Party and was a far cry from welfare in Victorian

⁷ World Data Bank, (2016). *Age dependency ratio (% of working-age population)*. [online] Available at: <http://data.worldbank.org/indicator/SP.POP.DPND?locations=GB> [Accessed 22 Jul. 2016]

⁸ World Data Bank, (2016). *Population ages 65 and above (% of total)*. [online] Available at: <http://data.worldbank.org/indicator/SP.POP.65UP.TO.ZS?locations=GB> [Accessed 22 Jul. 2016]

⁹ *Old-Age Pensions. Official Statistics*. (1909). The Times (38862). 21 January, Page 10.

Britain however one could argue that it was a great success by paving the way for modern social welfare.

1946 saw the birth of the welfare state as we know it with the 1946 Insurance Act – instituted by Clement Attlee’s Labour Government. Under this act, working people made compulsory contributions to the welfare state and in return they were able to accept the benefits that it offered such as unemployment benefit, maternity pay, comprehensive health care, and of course old age pensions which were universally available¹⁰. This pension scheme saw means testing abolished and the qualifying age reduced to 65 for men and 60 for women – albeit with financial incentive for individuals to work beyond this age.

There was justification for this generosity towards the aged and working populations. The 1945 election victory for Attlee’s Labour was on the back of World War II, and his campaign was led by a strong post war contingency plan¹¹. The work force was seriously depleted after the huge loss of life and even the men and women who has to keep the country going from home were stretched to their limit. The nation deserved some post-war relief for their effort and sacrifice; the 1946 Insurance Act gave it to them.

Since then we have not seen large restructuring to the system – only small manipulations to try and improve the schemes, despite monumental changes to the social, economic and political world. There has been very little adaptation to prescribe to our present climate so we are now facing the effect. Huge quantities of unaccounted liabilities in the pension funds will appear as the number of people whom qualify for state benefit grows while the number of those of working age will remain stagnant.

All of the money which is paid to the aged must be funded somehow and under the current system in pensions are paid for directly by the work force at that time – it is a form of *defined benefit scheme*. This contractarian approach relies on either a constant population or a constant rate of population growth. Hence, the changing population profile as discussed in the previous section will cause a bump in the road.

The government has, very recently, taken steps towards improving the system for future generations by implementing plans to raise the age of qualification for state pension to 67 for both men and women by 2028 – the effect of that change shall be considered, later in this report. Pension spending current constitutes 55% of the welfare budget, equating to approximately £114bn and with the growth in number of pensioners this is expected to grow by on average £2.8bn per year¹².

1.3 Why Do We Need Pensions?

Retirement is a luxury that everyone hopes to one day have. It is a time of rest, relaxation and enjoyment for millions across the nation however this luxury comes at a cost. People must be capable of funding this extended period without working and this is no simple matter.

Throughout their working lives, the majority of workers are constantly saving into private pension funds, in preparation for the day that they choose to retire. The intention of

¹⁰ Robson, WA. (1946). *The National Insurance Act*.

¹¹ BBC News, (2008). 1945: *Labour Landslide Buries Churchill*. [online] Available at: http://news.bbc.co.uk/1/hi/uk_politics/vote_2005/basics/4393271.stm [Accessed 21 Jul. 2016].

¹² Parliament.uk, (2015). *Political challenges relating to an aging population: Key issues for the 2015 Parliament*. [online] Available at: <https://www.parliament.uk/business/publications/research/key-issues-parliament-2015/social-change/ageing-population/> [Accessed on 18 Jul. 2016].

this saving is to *smooth one's wellbeing*. We value consumption equally across our adult lives¹³ so retirees will not wish to see a significant decline in wealth after they stop working. They enter a period of dissaving – they begin to spend the money that they have been setting aside during their working lives.

So if people have the ability to save for their retirement, what is the need for social security that is provided by the state? As already discussed, state pensions account for a huge portion of government expenditure and this figure is soon to grow. So with this in mind, is it possible for the members of parliament to delegate the responsibilities of social security to households and the private market, hence eliminating the entirety of the budget deficit? Clearly not, and for a multitude of reasons.

There is far too much unknown and uncertainty surrounding the private saving system for pensions. Firstly, individuals are saving in preparation for a spell of unemployment that spans until their death – this *'end date'* is not known so this can lead to some serious complications. Retirement could last 2 years, hence the person could have hugely over-saved and therefore could not enjoy the money that they otherwise saved. Alternatively, and more seriously, retirement could last 25+ years and an individual under-saves. This could be disastrous without the precaution of government intervention.

A possible solution to this unknown *'end date'* from the private sector is the use of annuities. This is a contract promising a small yearly pay out from a private firm, for an initially large cost. The safety comes in that the firm will pay this sum until the death of the contract holder. This may be a sensible scheme however there is still masses of uncertainty which still circulates the private market – the last few years have proven how unpredictable financial institutions can be. The financial crisis of 2007-2009 decimated pension funds¹⁴, leaving a monumental gap between the quantities of money promised by firms and the money that these firms have available to them. BT is an example of one such company; their pensions deficit is predicted to £9.9bn¹⁵ – having grown by £3bn from June 2015 to June 2016. This deficit is equivalent to approximately 25% of its total value¹⁶.

This alludes to the second issue faced by private pension schemes – market uncertainty. It is common practice for people to save their money in mutual funds, broad private portfolios which are set to grow safely over time, however one cannot predict the long term future with confidence. As markets collapse, trillions of pounds are lost in these funds and people are left without their nest-egg. The government must make themselves available as protection for such a situation since we cannot, on any ethical level, allow people to suffer in old age as they cannot afford to retire or cannot retire into a comfortable lifestyle.

Another factor in this argument is that people are often found to under-save when left to their own devices. This may be due to individuals not being forward-looking, or perhaps because of the consumerist nature of western society. Whatever the case may be, the saving rate in the UK is remarkably low – a point of discussion later on – and without the aid of state

¹³ Browning, M. and Crossley, TF. (2001). *The Life-Cycle Model of Consumption and Saving*. Journal of Economic Perspectives, Vol. 15, No. 3.

¹⁴ Tower, I. and Impavido, G. (2009). *How the Financial Crisis Affects Pensions and Insurance and Why the Impacts Matter*. IMF.

¹⁵ Financial Times, (2016). *BT pension deficit balloons by nearly £3bn*. [online] Available at: <http://www.ft.com/cms/s/0/59b0da16-347a-11e6-bda0-04585c31b153.html#axzz4GuqPGqVq> [Accessed 10 Aug. 2016]

¹⁶ Forbes, (2016). *BT Group*. [online] Available at: <http://www.forbes.com/companies/bt-group> [Accessed 10 Aug. 2016]

social security, people are left with insufficient finances for retirement. An example of this is that the number of self-employed workers has risen in recent years, however the number of self-employed workers saving into pension funds has halved¹⁷. This is good reason for a government safeguard.

1.4 The Current Economic Climate

A vital component to considering the future of social security is to take full consideration of the current economic climate. As already mentioned in the last section, the welfare system as we know it was built in the aftermath of WWII, to fit that unique situation, however since that time we have seen very little adaptation to fit modern times. The 21st century has seen two major financial crises in our short 16 years: The DotCom Bubble of 2000/2001 combined with the terrorist attacks in 2001, and the housing bubble of 2001-2006, then subsequent global financial crash of 2007-2009. These two events were devastating to private pension funds and also crippled pension funding.

These kinds of events have a profound impact on the livelihoods of the current aged population as well as the current work force who are saving for their retirement.

"The most direct effect on pensions is through the prices of financial assets such as corporate equities and bonds. Because the majority of pension assets are held in equities, drops in stock prices have had a significant adverse effect on pension plans."

-Peter Orszag, Director of the Congressional Budget Office¹⁸

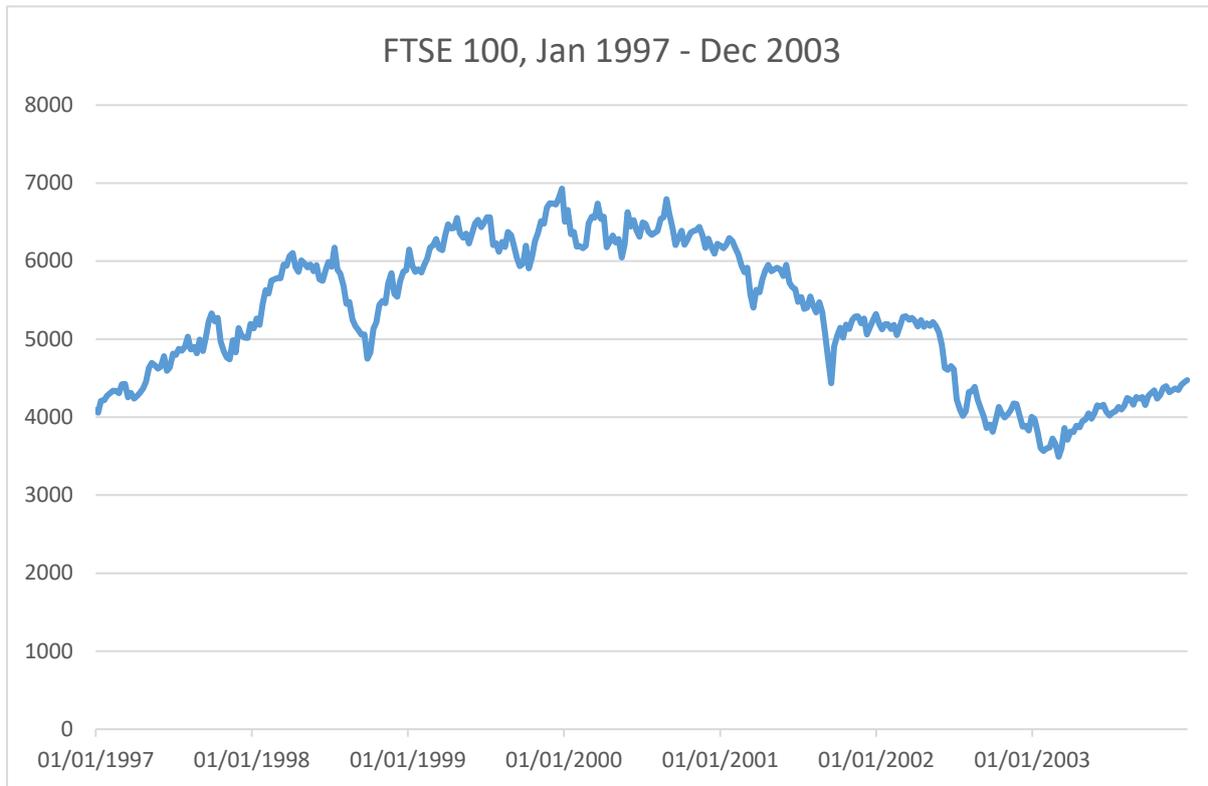
As markets fall in value, and the corporate assets and bonds plummet in value, the money that people have invested for their retirement in private funds suffer.

The bursting of The DotCom Bubble's impact on the markets was not particularly large. As the internet was in its early stage of emergence the prices of stock rose exponentially

¹⁷ Citizen's Advice, (2016). *Shy of retiring: Addressing under-saving among self-employed people*. [online] Available at: <https://www.citizensadvice.org.uk/Global/CitizensAdvice/Work%20Publications/shy-of-retiring.pdf> [Accessed 2 Aug. 2016], Page 11

¹⁸ Mantell, R (2008). *Pensions Suffering in Financial Crisis*. [online] Available at: <http://www.marketwatch.com/story/pension-funds-take-1-trillion-hit-in-wake-of-financial-crisis> [Accessed 21 Jul. 2016]

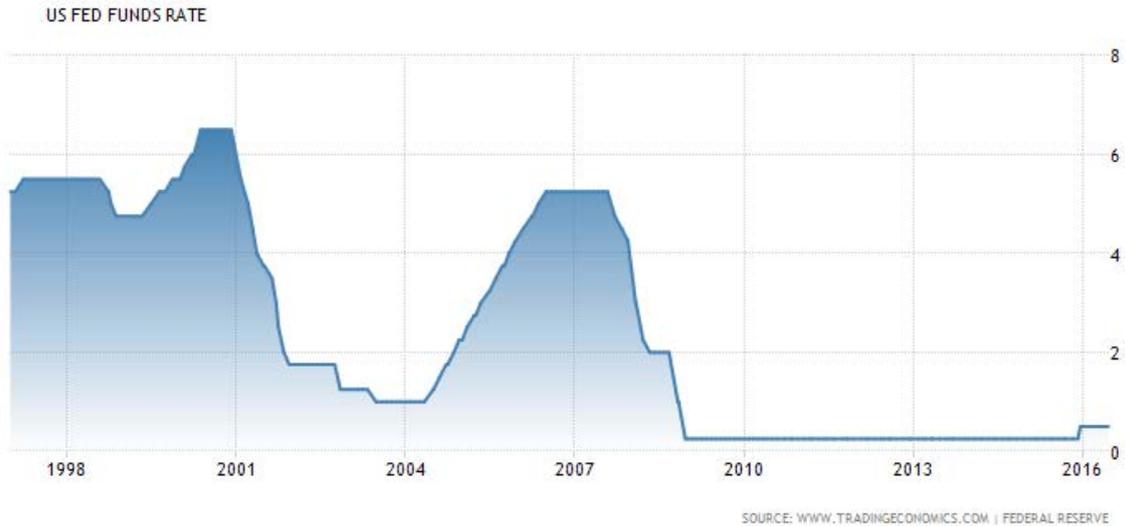
although eventually this rise in value was seen to be unjustified and share prices fell overnight, causing a small shock to international markets.



¹⁹Figure 6

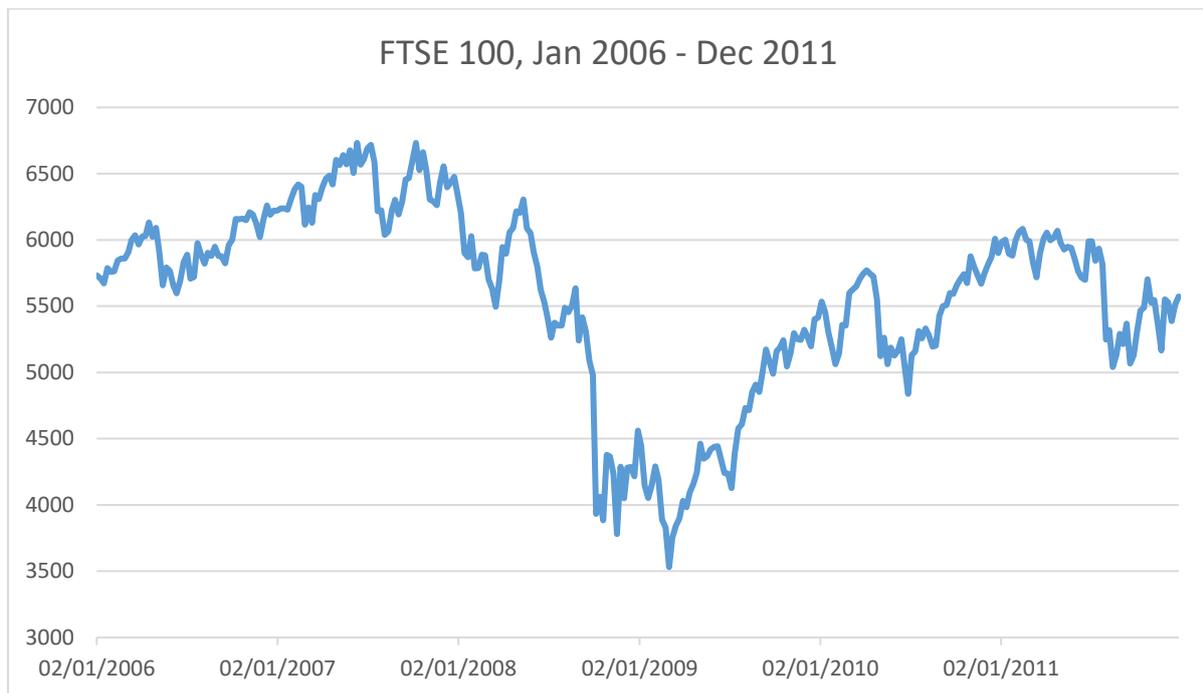
Above, we can see the closing value of the FTSE 100 between January 1997 and December 2003 – the FTSE 100 is the sum of the values of the 100 largest companies in the UK, giving an indication of the health of the total UK economy. We can see a plateau after a period of growth in the late 1990's and then during 2000/2001 we can see a decline in worth. This was far from a large decline however this triggered other events to take place. The US economy suffered a similar downturn, so in the aftermath of the shock, Alan Greenspan - who was chairman of the Federal Reserve at the time – announced a reduction in the FED Interest Rate.

¹⁹ Yahoo! Finance, (2016). *FTSE 100 Historical Prices*. [online] Available at: <https://uk.finance.yahoo.com/q/hp?s=%5EFTSE&b=01&a=00&c=1997&e=31&d=11&f=2003&g=w> [Accessed 20 Jul. 2016]



²⁰Figure 7

These historically low rates from the FED meant investors were no longer satisfied by treasury bills – the 1% return on investment was too small. Instead there was an over investment in the housing with the (now) infamous Collateralised Debt Obligations, causing a bubble in housing prices. As this bubble burst the financial world descended into chaos. Markets plunged.



²¹Figure 8

²⁰ Trading Economics, (2016). *United States Fed Funds Rate*. [online] Available at: <http://www.tradingeconomics.com/united-states/interest-rate> [Accessed 20 Jul. 2016]

²¹ Yahoo! Finance, (2016). *FTSE 100 Historical Prices*. [online] Available at: <https://uk.finance.yahoo.com/q/hp?s=%5EFTSE&b=01&a=00&c=2006&e=31&d=11&f=2011&g=w> [Accessed 20 Jul. 2016]

This mammoth plummet illustrated above represents a significant decline in the value of private sector equity, and hence this had a huge impact on the private pension systems. A catastrophic event like this typifies the necessity of the state provision of social security. Nearly a decade on we are only just reaching a level of wealth that we had in the beginning of 2007 and this long-lasting stagnation has meant that pension funds have not grown.

Governments were left to bail out banks, creating larger national debts. National debt *crowds out* economic welfare because private money is being used to repay a public debt rather than being spend on goods and services or invested in beneficial ventures. Debt has a long term negative impact on economies and with this, alongside an excessive budget deficit, there is growing pressure on the welfare budget.

For the last 6 years after the financial crisis we have seen a Conservative government implementing crippling levels of austerity – largely focused on cutting welfare spending²². Austerity is widely rejected by leading economists²³ and yet George Osborne has continued to damage people’s livelihoods for the sake of the budget deficit. We are yet to see the approach that, new Chancellor of the Exchequer, Phillip Hammond will take.

Again, the grief within the pensions market was not helped by government in 2016 as the UK voted to divorce from the European Union. A shock result sent shockwaves across the world, with no-one still sure of how things will be going forward. Uncertainty current reigns supreme and what affect will this have on people and their welfare?

The immediate aftermath of *Brexit* saw a short term dip in world financial markets. In terms of the pension market – an extra £85bn deficit opened up across the nearly 6000 private pension schemes that are listed in the PFF 7800. The total deficit is estimated to be approximately £925bn²⁴; disconcerting news for anyone planning for the future.

²² Institute for Fiscal Studies, (2015). *Recent Cuts to Spending*. [online] Available at: http://www.ifs.org.uk/tools_and_resources/fiscal_facts/public_spending_survey/cuts_to_public_spending [Accessed 2 Aug. 2016]

²³ Krugman, P. (2011). *The Austerity Delusion*. The New York Times, 24 March.; Seymour, R. (2014). *Against Austerity*. University of Chicago Press Economics Books.; Wren-Lewis, S (2011). *The Case Against Austerity Today*. IPPR.

²⁴ Burgess, K (2016). *Pensions Stretched to Breaking Point After Brexit Vote*. [online] Available at: <http://www.ft.com/cms/s/0/1d92b818-4426-11e6-9b66-0712b3873ae1.html#axzz4GjGjhyA> [Accessed 22 Jul. 2016]



²⁴Figure 9 – Pension Deficit (£bn), based on 5945 schemes in the PPF 7800 Index

In the wake of *Brexit*, uncertainty has been prevalent, which could potentially cause economic downturn. As alluded to earlier, economic stagnation and recessions are bad news for people's savings as our current private pension system revolves around growth to support funding. If we fail to see growth, the gap in liabilities will continue to grow.

During the time writing this, the Bank of England has cut the base rate from 0.5% to 0.25% to abate the potential stagnation. This is the rate of interest at which banks and the government can borrow money from the central bank. The intention is to encourage banks to borrow this 'cheap' money and therefore lend cash more freely. With an increase in lending, households are being drawn to take loans and hence spend – thus boosting the economy with extra demand. This measure is seen to be necessary since an important part of ensuring wellbeing is to keep the wheels turning and maintain demand of goods or services. The economy must be kept ticking over for the benefit of living standards.

Despite providing aid to the economy, there is an adverse effect on the savings rate as individuals spend rather than save, possibly causing detriment to their financial planning for the future. A factor that shall be discussed, later in this report, is that the UK saving rate are too low and promoting borrowing could aggravate the symptoms. The positive outcome from this move, from a government perspective, is that the state is able to borrow at a tiny interest rate. The public sector can take out a calculated loan – at minimal cost – with the intention of stimulating the private sector and also injecting funds into public services.

1.5 Taking Stock

Now would be a good place to stop and take stock of what we have already ascertained.

1. Firstly, our population is ageing. We're facing a significant change to the population profile as well as a growth in the total population.
2. State provision of pensions is a must. There must be government measures for our aged and at risk – security beyond working age is an ethic right.
3. Our current state pensions are dated. We have seen very little change in the system since it took its current form in 1946, despite a complete change in circumstance.
4. Recent economic turmoil has left us in a deep hole with reference to:
 - a. Large national debt

- b. Over £900bn of pension deficit
- c. Stagnation and constant uncertainty
- d. European Union divorce
- e. Housing crisis
- f. Environmental damage still being relatively unmanaged

2.1 What is sustainable, with respect to our economy?

It feels as though the last few sections of this paper have been abundant in negativity however that is not the purpose of this paper. We can look at our current state as bleak or we can look at our position as an opportunity to re-organise and flourish. To consider our future in a holistic and informed way, we must first fully understand the predicament which we find ourselves in.

The goal must be sustainability – in all respects. Economic sustainability encompasses a plethora of factors: finance, job markets, housing markets, environmental responsibility, and many more. We live in a complex ecosystem and we must attempt to ensure the welfare of every element.

The definition of *sustainability* has innumerable varieties depending on context or who you ask. With respect to this report, economic sustainability would be the ability to uphold welfare in a way which is not damaging or negatively impacting future generations.

Already we have harmed our future generations with or disregard for environmental care. Deforestation, excessive gas emission and constant urbanisation have been constant over the last century. Economic sustainability goes beyond the financial sector, as without a functioning ecosystem to live in then there won't be an economy to discuss. As we discuss plans to aid our economy in the face of a changing population, we must consider the environmental impact simultaneously.

There is a selfish hedonism to capitalism – those who are responsible for the global financial crisis, after making more money than we can comprehend, were never brought to justice. They kept their money and freedom, leaving the government to bail out the bank; the taxpayers were paying debts that the banks were responsible for. These actions were not sustainable since it will be future generations who will be paying off the monumental debts.

We must aim for a utilitarian solution. We want to recover from our current state and then pass the torch to the future generation to carry on. The system must be flexible enough to adjust to changes in economic climate and stable enough to ensure a greater level of certainty beyond our own generation. The goal must be to maintain high living standards across classes and generations. Education, and health care are vital. We cannot accept a fall in any of these factors, whilst protecting our delicate ecosystem to ensure that we have left an environment fit for use by generations to come.

This solution may require a new school of thought. Perhaps we should not be quite so fixated on *growth* but rather wellbeing and consistency. Short-termism is the bane of modern existence; there is a distinct lack of patience in the current collective consciousness. Instead of aspiring for smaller yet reliable long term profit, firms want large profits quickly and try to achieve this with disregard for the medium to long term future of the company²⁵. We must

²⁵ Grinyer, J. et. al. (1998). *Evidence of Managerial Short-Termism in the UK*. British Journal of Management, Vol. 9, Pages 13-22.

adopt a new mantra, a *long-termist* mind-set. Sustainability is only possible with patience and consideration for future generations.

2.2 Formulating Our Models

To continue towards our goal of exploring the possible futures ahead and how our government can aid us in reaching a state of continuity and sustainability, we must formulate a model from which we can gain insight. These models shall be descriptive, rooted in System Thinking. We shall consider several variables at once, using causal relationships which will be founded on empiricism or the published thoughts of academics.

The most important factor in our economy is *living standard and wellbeing*; the objective of change is long-term maximisation of living standards. This is the purpose of economics - the study of distributing goods and services for the benefit of the population. Collective welfare is the core of humanity and this is a mantra which has been lost or diluted over the years. Collective welfare means an adequate level of wealth shared across everyone, including all elements of our ecosystem. Financial inequality and causing ecological imbalance have the same kind of negative impact on collective welfare.

There is a common misconception within modern economics: that profits are an ends and that people are simply a means to that end. In this report, this belief shall be emphatically rejected – the welfare of people is central. There will be times at which finance is discussed as a core factor because money allows for the consumption of goods and services and that a core component of living standards and contentment²⁶. Of course there is a multitude of other factors which enter living standards, some of which money cannot buy, although we must at least concede that wealth translates to a comfortable degree of living and an ability to keep oneself healthy.

A huge aspect of this analysis is centred around the state pension system since this is a vital service which the government provides, and also their largest contribution to the welfare of an ageing population. Pensions guarantee comfort of living after retirement, directly correlating with the wellbeing of the aged. It has been reiterated over and over that pensions are a necessity, and thus population ageing will have a seismic impact on economic health and sustainability through the impending strain on the state budget.

While we have primarily addressed the economic issues that circulate an ageing and growing population, we must bear in mind that the economy is a subset of the ecosystem. We live within the physical constraints of our planet and any solution must follow this. We are in the midst of a housing crisis and we cannot expect this to disappear but, on top of our current state, we will see the issue exacerbated as population grows and demand soars. Will the housing crisis be solved? And what further impact will the solution have on our wider ecosystem? We cannot continue to pillage green spaces in the interest of new housing.

3.1 Collective Wellbeing and Pensions

A key bugbear for the UK Government to address will be the increasing requirement of state pensions with less money available to fund such a need. The repercussions of this increase in pension demand will be profound, as less state funding will be available for other vital institutions. The government is left with 3 choices: add to the already astronomical national

²⁶ DeLeire, T. and Kalil, A. (2010). *Does consumption buy happiness? Evidence from the United States*. International Review of Economics, Vol 57.

debt and suffer the consequences, watch other key state institutions be crippled, or finally, adapt the current pension system and emerge in a stronger, more sustainable situation.

Bringing about this change will be difficult on both a logistical and political level. While in an ideal world we could be compassionate towards everyone, providing large state benefits to all, we cannot deny the constraints that surround these schemes. Intention should be generosity however prudence is vital; the government may be comparable to a bank but frivolity can prompt catastrophic problems for the economy and hence damage the livelihoods of citizens. Protecting the collective welfare, with sustainable long-term solutions, is needed.

We have seen change to the pension system earlier in 2016 however the question remains: was this change enough? Figure 10 shows the predicted growth in necessary pension budget over the coming 50 years, even after the changes have been implemented, and we can see a consistent and significant rise of approximately 3% of GDP. To put this into perspective, 3% of GDP in 2015 was £55bn²⁷ and the pensions budget was £150bn²⁸. Obviously these figures will not be the same in 2065, however the change will be proportionate as we expect to see an increase in the necessary funding of a third.

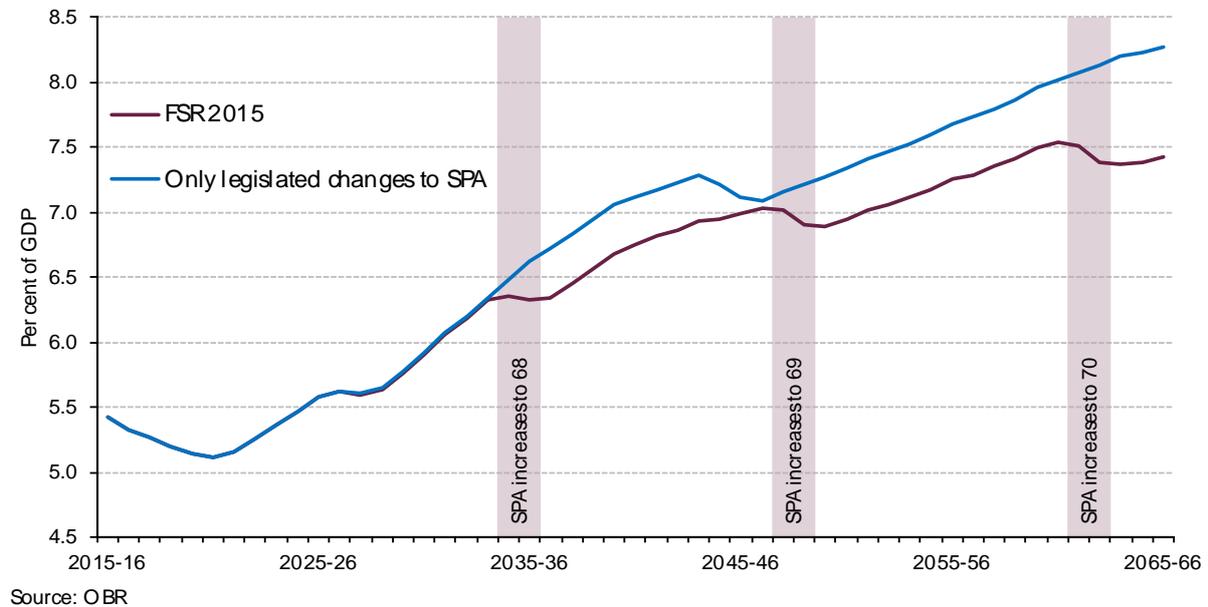


Figure 10 - Projected Pension Demand (% of GDP)

29

²⁷ Office for National Statistics, (2016). *Gross Domestic Product (GDP)*. [online] Available at: <https://www.ons.gov.uk/economy/grossdomesticproductgdp> [Accessed 3 Aug 2016]

²⁸ HM Treasury, (2015). *Public Expenditure Statistical Analysis*, Page 24. [online] Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/446716/50600_PESA_2015_PRINT.pdf [Accessed 3 Aug 2016]

²⁹ Office for Budget Responsibility, (2016). *Fiscal sustainability analytical paper: Population projections and pension spending update*, Page 12. [online] Available at: http://budgetresponsibility.org.uk/docs/dlm_uploads/FSAP_July_2016_population_projections_and_pensions_spending.pdf [Accessed 29 Jul 2016]

It is clear from the above figure that the measures taken so far, with respect to pensions, are inadequate. To assess the factors and issues surrounding the pension system, we must create a descriptive model.

We can already conclude that the state pension aids wellbeing of the aged by giving them peace of mind around their finances. They are able to afford the basic goods and services that we need to live, without the fear of the money running out. We know that pensions are funded through tax revenue, so a consistently larger amount of state revenue allows for more generous spending per person. Unfortunately, we expect that population ageing could lead to a relative fall in tax revenue, as we see a greater proportion of people in retirement who are paying less tax than those in full time employment.

Retirement age has a broad impact. Firstly, a higher retirement age raises the proportion of the population working and reduces those claiming pensions - hence we would expect to see a positive influence on tax revenue. Similarly, with a higher retirement age, there are less individuals claiming state pensions and therefore the government might be able to afford more generous benefits for those who do claim. This is in keeping with the historically benevolent state pensions which were only supplied to the relatively small number of people of pension age.

The case can be made that there is a balancing cyclical relationship between the retirement age and living standards. The ability to retire when younger reduces the number of years spent working and hence eases the toll on one's body - work can be very physically draining, especially for an aged body. Conversely, with better health and all-round improved wellbeing, a person would have the ability to work productively later into their life, without serious negative implications. It has been argued that a more positive work environment with a good work-leisure balance – two factors of living standards – can delay the desire for retiring³⁰.

The size of the funding gap must be taken into consideration. With a larger funding gap, the more government liabilities are not accounted for which will have dire effects for other government sectors, pensioners, or the national debt; all of these factors can be devastating for collective welfare. The arrow can be seen to be dashed because the relationship between the size of the state pension and the funding gap is not guaranteed, for example, the gap would not grow, if pensions were to grow but the number of people receiving it shrank by enough.

³⁰ Siegrist, J. and Rödel, A. (2006). *Work stress and health risk behaviour*. Scandinavian Journal of Work, Environment & Health, Vol. 32, No. 6, Pages 473-481.

The resulting model is found below (figure 11).

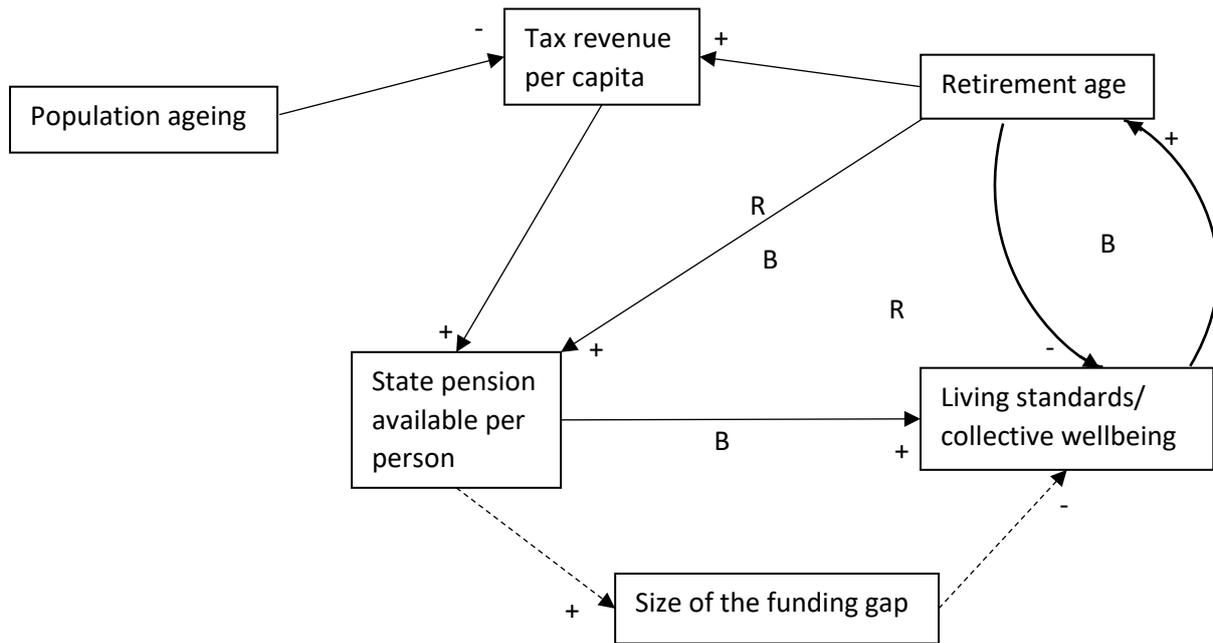


Figure 11

We can see five loops in this system - the first having already been discussed above. From this balancing relationship, it is clear that the state must strike a balance between retirement age and the resulting living standards.

There are two loops, each reinforcing relationships, that link: retirement age, tax revenue, state pension and living standards. These are highlighted below, in figure 12. The final 2 loops are a result of the funding gap and how this may impact wellbeing.

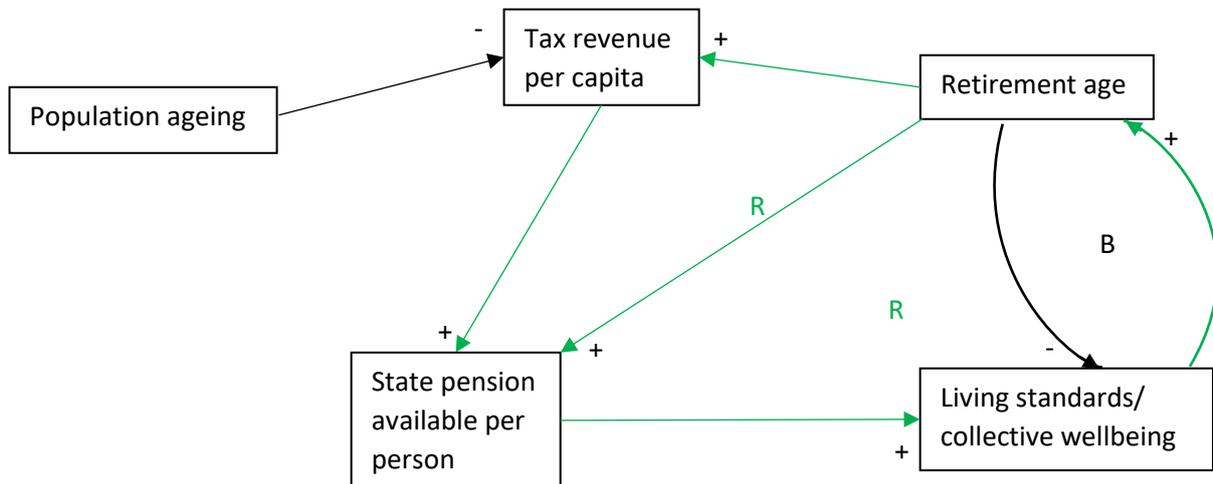


Figure 12

Reinforcing relationships are not good when we face a decline in one variable, since then we see exponential decay in all related variables. When population ageing reduces the tax revenue per capita, we may see devastating ramifications for living standards. Methods must be found to soften this blow. This is exactly what was attempted in 2015.

The two key changes, recently made by the Conservative government, was the gradual increase in retirement age from 65 (men) and 60 (women) to the common age of 68, and also

the increase in maximum allowance from £119.30 per week to £155.65 per week. The trouble with this is that we will see two opposing affects thus cancelling each other out. The intended effect was to pay the pension for a shorter period – the retirement age was raised by 11 years collectively - however the allowance will potentially be increased by £1890.20 per annum so, by a certain age, the new pension system will result in more income for the retiree. Table 1 shows a summary, comparing two individuals who receive the maximum allowance.^{31, 32}

Table 1

Maximum pension under old system	£6,203.60 p/a
Maximum pension under new system	£8,093.80 p/a
Difference between systems	£1,890.20 p/a
Years required for men to earn more through the new system (age)	9.85yrs (77.85)
Years required for women to earn more through the new system (age)	26.26yrs (94.24)

The likelihood of the new system paying more to females is currently slim since it would require living to an age of 95, although the population projections show a significantly greater proportion of people living into their 90's or beyond. On the contrary, it is likely for men to be better off under the new system as the critical age is 78; as we know, this is already above the current life expectancy and we have already concluded that the number of people living beyond this age with notably increase.

Other changes to the system included instigating a line scale for pension entitlement, retracting the spousal allowance and altering the ability to 'top up' national insurance contributions with credits. Each of these aid the reduction in state liabilities, although the research by the Office for Budget Responsibility still indicates that these steps are not yet adequate.

The unfortunate truth is that the current level of generosity, with respect to the size of state pensions, is not sustainable on the scale which will be required. A substitute for the current scheme must be found, with fairness and equality as central goals.

One possible approach might be to reintroduce means testing, as was the norm prior to 1946. The intention must be to reduce the strain on the government through the pension budget and an appropriately constructed system would cut the future pension liabilities, in theory, without excessive damage to welfare. A degree of damage to welfare is an inevitability, although means testing would minimise this effect. This testing could be an analysis of total career earnings, or perhaps of the expected pay from private pension schemes – of course a safety net needs to be there however not everyone requires to constant support. The concerns

³¹ UK Government, (2016). *Basic State Pension*. [online] Available at: <https://www.gov.uk/state-pension/what-youll-get> [Accessed 18 Jul 2016]

³² UK Government, (2016). *The New State Pension*. [online] Available at: <https://www.gov.uk/new-state-pension> [Accessed 18 Jul. 2016]

with this ideal is that it promotes the poorer families to work longer and save more, whereas the wealthiest retire earlier³³ – potentially decreasing the tax revenue per capita.

The government currently approaches pensions on a national scale – there is no level of geographical subjectivity. One possible way to improve on this aspect might be to devolve, at least a portion, of the pension fund. *Devolution* places a greater level of responsibility on the local government to distribute smaller, more manageable, budgets. The basic weekly pensions could be a smaller quantity, decided on the national scale, but with the means testing being done by smaller local divisions whom can adopt a more personal perspective. Size of local budgets can be region dependent, for example, taking into account cost of living, wealth of the area, how ‘elderly friendly’ the living situations might be, et cetera. Clearly, this solution carries with it a huge logistical component, requiring a lot of work and co-ordination, however it is a more personal approach which could minimise the risk of poor living standards. If set up correctly, this could be a far more efficient and hence sustainable solution.

An alternative path might be to reduce the weekly pension amount and provide a greater level of support surrounding the private pension system. This support might be added security in the event of market-downturn however the primary intervention of the government might be a greater degree of education for young individuals. Financial literacy is an important factor when it comes to planning for the future – referring to one’s understanding of the financial world – however it has been found that knowledge is generally poor³⁴. Only one third of Americans could answer 3 questions about personal finance which are, by comparison to the complexity of planning retirement, trivial. This is ominous and not an issue which is local to the USA. The responsibility of ensuring adequate understanding of retirement lies on the shoulder of the government and the government must step up to the task. Part of this education must be to inform young people that the system will not be as it is today so there will be a greater degree of pressure on workers to save in preparation. At this moment, saving is lack-lustre to say the least, as shown in figure 13³⁵.

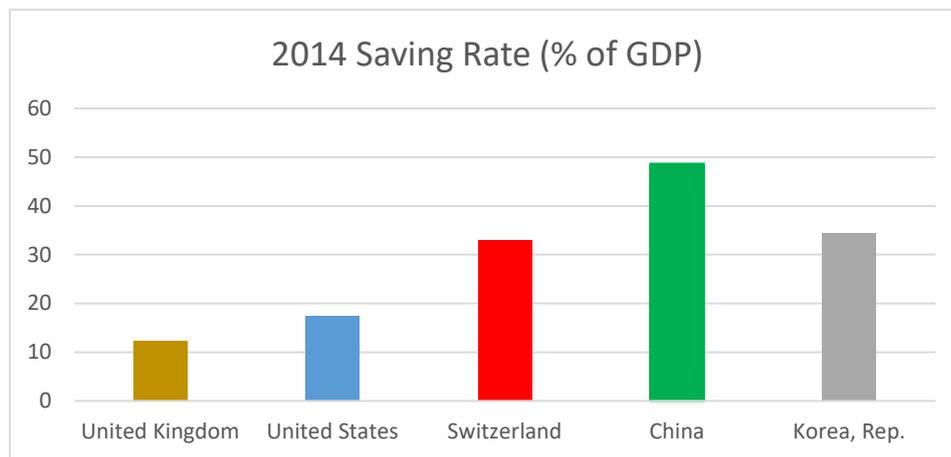


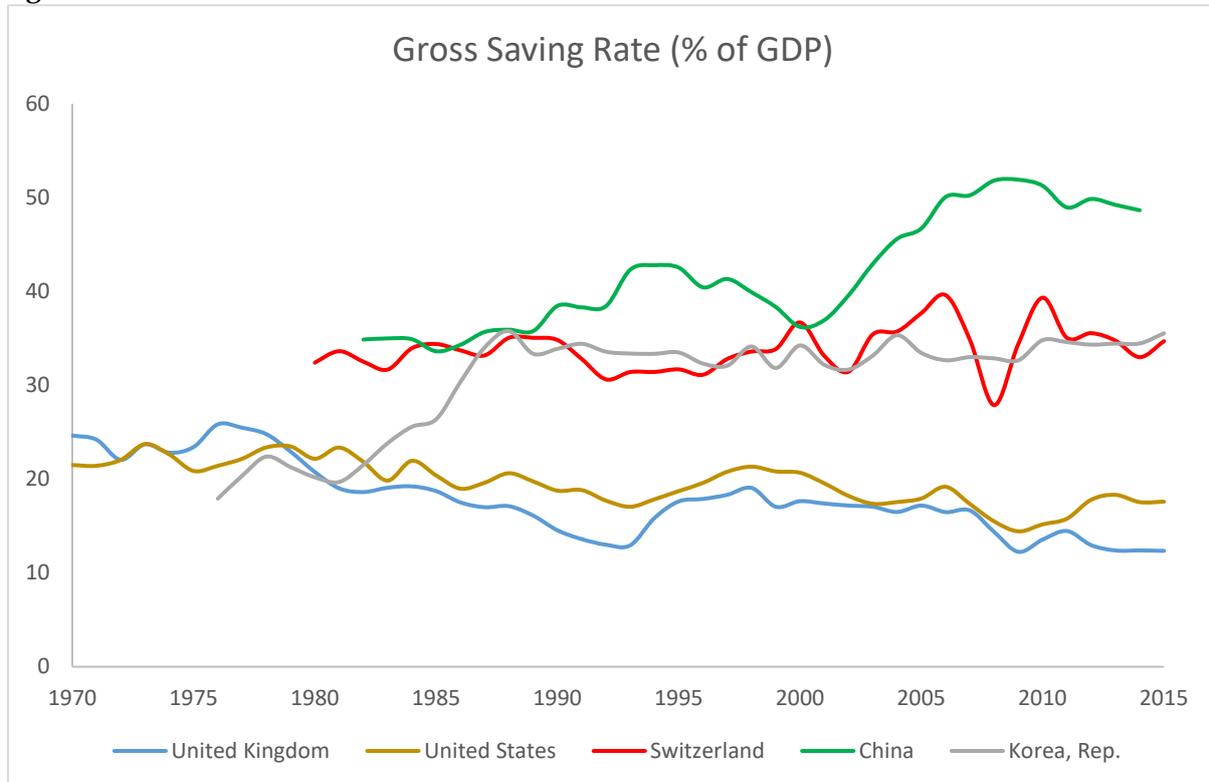
Figure 13

³³ Sefton, J. and Van Der Ven, J. and Weale, M. (2008). *Means Testing Retirement Benefits: fostering equity or discouraging savings?* The Economic Journal, Vol. 118, Issue 528.

³⁴ Mitchell, OS. and Lusardi, A. (2015). *FINANCIAL LITERACY AND ECONOMIC OUTCOMES: EVIDENCE AND POLICY IMPLICATIONS*. GFLEC.

³⁵ World Data Bank, (2016). *Gross savings (% of GDP)*. [online] Available at: <http://data.worldbank.org/indicator/NY.GNS.ICTR.ZS> [Accessed 27 Jul 2016]

The UK and US save a fraction of the wealth, by comparison to some of the world leaders in saving: China, South Korea and Switzerland. These tendencies are not just recent; the developed western nations have always been poor savers, historically. This is displayed in figure 14.



³⁵Figure 14

It is clear that one responsibility of the government is the enhance the propensity to save among the work force. Households taking care of their own future, through saving, is one way to ease pressure on the state since the need for pensions will fall. Improving the saving rate might be the result of comprehensive education of the youth and work force about retirement, or perhaps could be instigated through other means, for example, a broader range of state-run saving schemes with tax incentives.

These approaches have the intention of addressing the need for state pensions and hence reducing the funding gap which is anticipated to grow at an extraordinary rate. Easing this gap will free up the state funding for integral institutions, avoid adding to the debt, and thus aid the collective wellbeing. This potential solution is independent of tax revenue which could prove to be vital as the population profile shifts. On an ethical level, one might argue that this solution is positive as there is an element of taking care of one's own future.

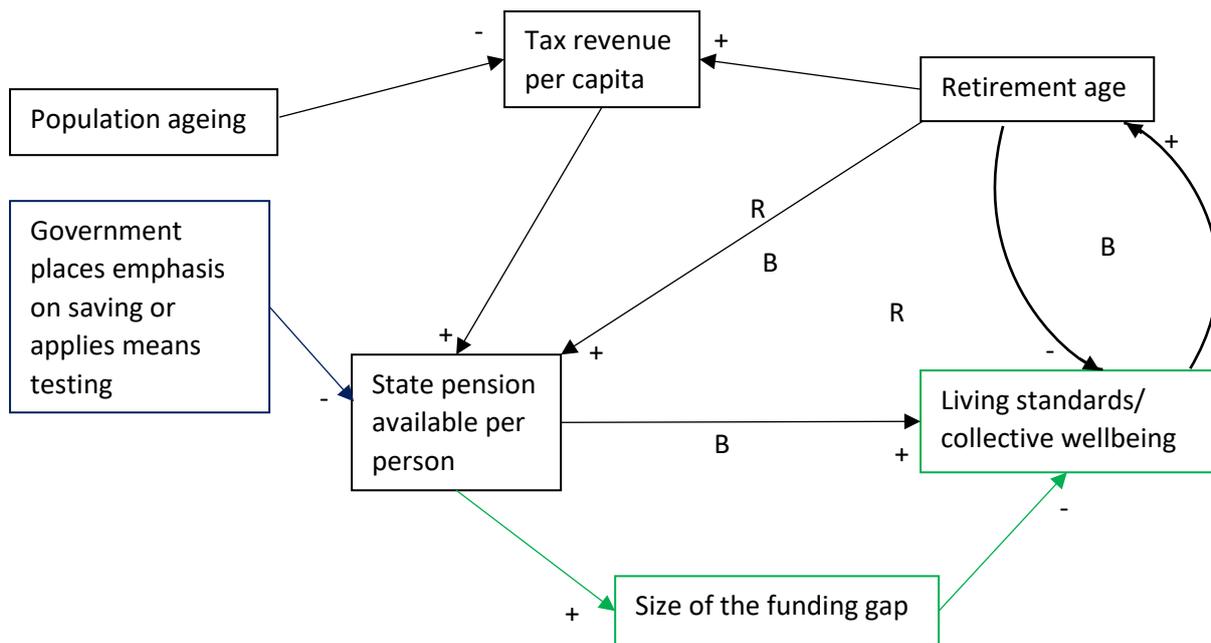


Figure 15

An alternative approach may be to consider manipulating the retirement age. Through raising the age at which one can claim their state pension, you are reducing the number of years that the state pension must be paid whilst increasing the amount of years that individuals will be paying income tax on full-time employment. This is not simple to enact though. A life of work has a notable physical toll on the body and many might be unable to continue working late into their 60's. A degree of public resistance might also be expected since individuals will be asked to work longer to receive less pension – something that may seem unfair to many and this is why education about our current situation is important.

A response to this could be to place an emphasis on the latter part of career trajectories. Commonly, people imagine a constant upward path however this does not necessarily have to be the case if an emphasis is placed on jobs suited for the aged. The job market for those in the late stages of their careers could be expanded with a variety of appropriate openings: with minimal physical labour, without the need to stand and less pressure. These jobs could be manufactured by the government or, created within private firms, through state incentive, facilitating a raising of the retirement age closer to, and perhaps even into, the 70's – thus lowering the pension demand.

One aspect of this change might be the future careers available to workers. With technology continuing to evolve at a mind-blowing rate, the types of job which will be available in 30 years – a shorter time span than the average working life – could be unrecognisable. With such a rapid change, the qualifications of many workers may become obsolete. As discussed in a report for the Schumacher Institute by A. Alonso Curbelo, the issue of mismatching skills could have an adverse effect on the jobs market, driving down future

employment rates – a concept which is supported by the ‘Search and Match’ model³⁶ – so efforts much be made to continually up-skill workers.

“Inevitably, workplaces will become more multi-generational and although technological advancement might place the younger in advantage, all four generations will continually need to invest in up-skilling, and the older age groups will need to embrace technology fully in order to remain competent. Furthermore, cross-generational skills acquisition will be crucial to create effective social networks in the workplace.”

-Ana Alonso Curbelo (2016). *Future of Work*. Schumacher Institute.

The potential impact of raising the age of retirement can be seen in Figure 16, below.

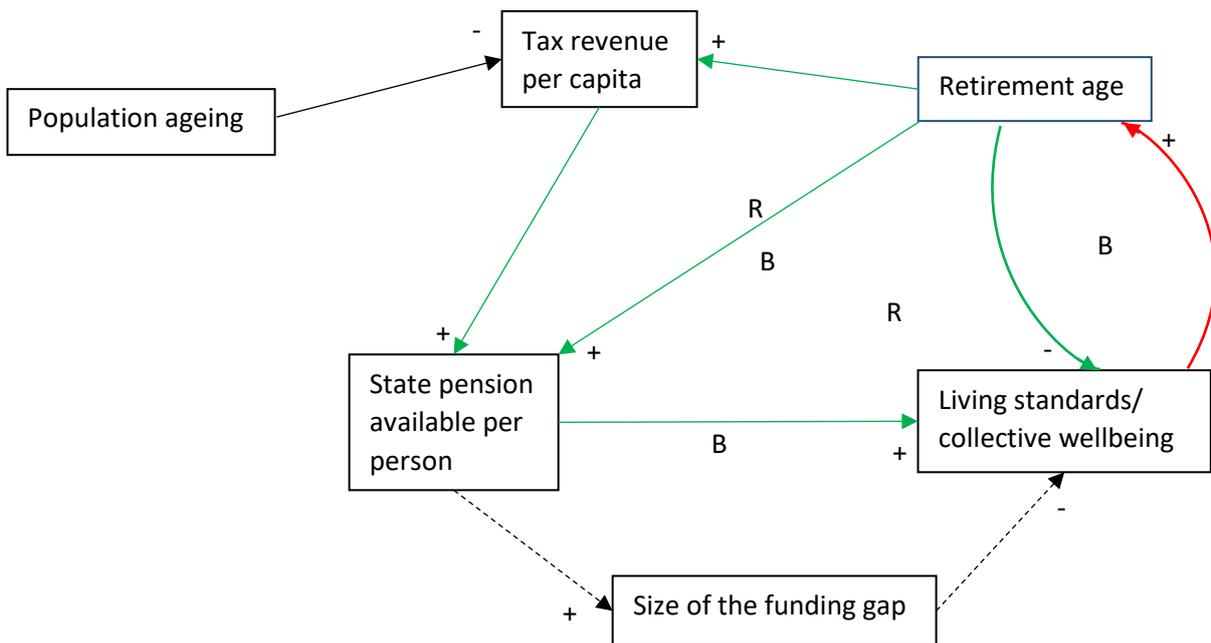


Figure 16

As we can see, there are two components which are affecting living standards: one positive, and one negative. It is the responsibility of the state to find a fair balance between *retirement age*, and *state pension available per person*. Through proper education on the matter, there is the greatest chance for a manipulation of the retirement age to be accepted. The new age must be fair to the needs of work force, while ensuring an adequate reduction in pension liabilities. It may be difficult for people to come to terms with at first, however working longer allows for a larger pension per week and more effective state provisions such as healthcare.

One possible substitute for the current state pension scheme might be to consider placing more emphasis on *benefits in kind*. These benefits take the form of a good or service without

³⁶ Pissarides, A. (2011). *Equilibrium in the Labor Market with Search Frictions*. American Economic Review, Vol. 101, 1092-1105.

the financial intermediary – in other words, the pensioner would have rights to certain things of value without money having to change hands. Examples of some benefits of kind, available to pensioners already, are free TV licenses, bus passes and medical prescriptions.

This system works well when there is a good or services with small marginal cost to the provider and large marginal benefit to the consumer – the provider bears the cost since this is a miniscule by comparison to cost that would otherwise be incurred by the pensioner. When the size of state pension must be cut, to account for the ageing profile, supplementing the allowance with benefits in kind could be an effective and cost efficient way for softening the blow to wellbeing. Services which are highly valued might include a phone line and internet connection; these services are highly valuable since they allow for communication and, as discussed later on, the ability for the aged to remain connected to their community, family and friends is central to wellbeing.

An ethical dilemma can loom when organising the system. Care must be used when organising these benefits because a balance must be found between gifting these specific goods or services and maintaining a level of independence within the life of the pensioner. Benefits of kind can be used to support pensions however they should not be the central form of payment since a level of autonomy must be available to the aged.

An approach which might address the rising dependency rate and increase in proportion of pensioners could be to develop purposeful growth of the work force through immigration. By promoting a larger propensity for migrants to come to the UK to live and work, the state could offset the rise in proportion of pensioners. There are several issues with this approach though. Firstly, the social implication of immigration remains difficult as there is always a proportion of individuals who dislike the concept – especially amid the current refugee crisis and level of fear surrounding terrorism. The scale of this concern was exemplified in the result of the EU Referendum in June. As sad as it may be, many people will not be comfortable with an influx of foreign workers. Secondly, the problem of ageing is not an issue which is local to the UK and this is an important fact which must be considered in our solution. Global life expectancy is on the rise while global fertility rates are falling. Countries such as Japan are already further along this road than the UK and contending with the issues which follow: 20 years of economic stagnation, a stretched public sector budget and a massive national debt. Sustainable solutions must be reached which are not dependent on cherry-picking the youthful workers of other nations. Immigration and emigration are wonderful things which provide immeasurable benefit however they cannot be leant on to solve this puzzle.

3.2 Education and Population Ageing

As already established, an upward shift in age profile of the population will place strain on the government budget since we will have a larger number of people requiring social security and proportionately less people contributing to the state via taxes.

Words cannot do justice to the importance of education as a government provision – education births opportunity. When every child has access to a high quality state education, you will see a rise in equality as each person will have the opportunity to follow whichever path they wish without institutional limitation. Education is a cornerstone of quality of life so has a significant impact on long-term welfare, hence this is a huge actor in economic sustainability. Some may argue that ignorance is bliss however this bliss does not translate into living standards.

The central question that must be asked here is how will the ageing population impact education?

To answer this question, we require the use of a specific model.

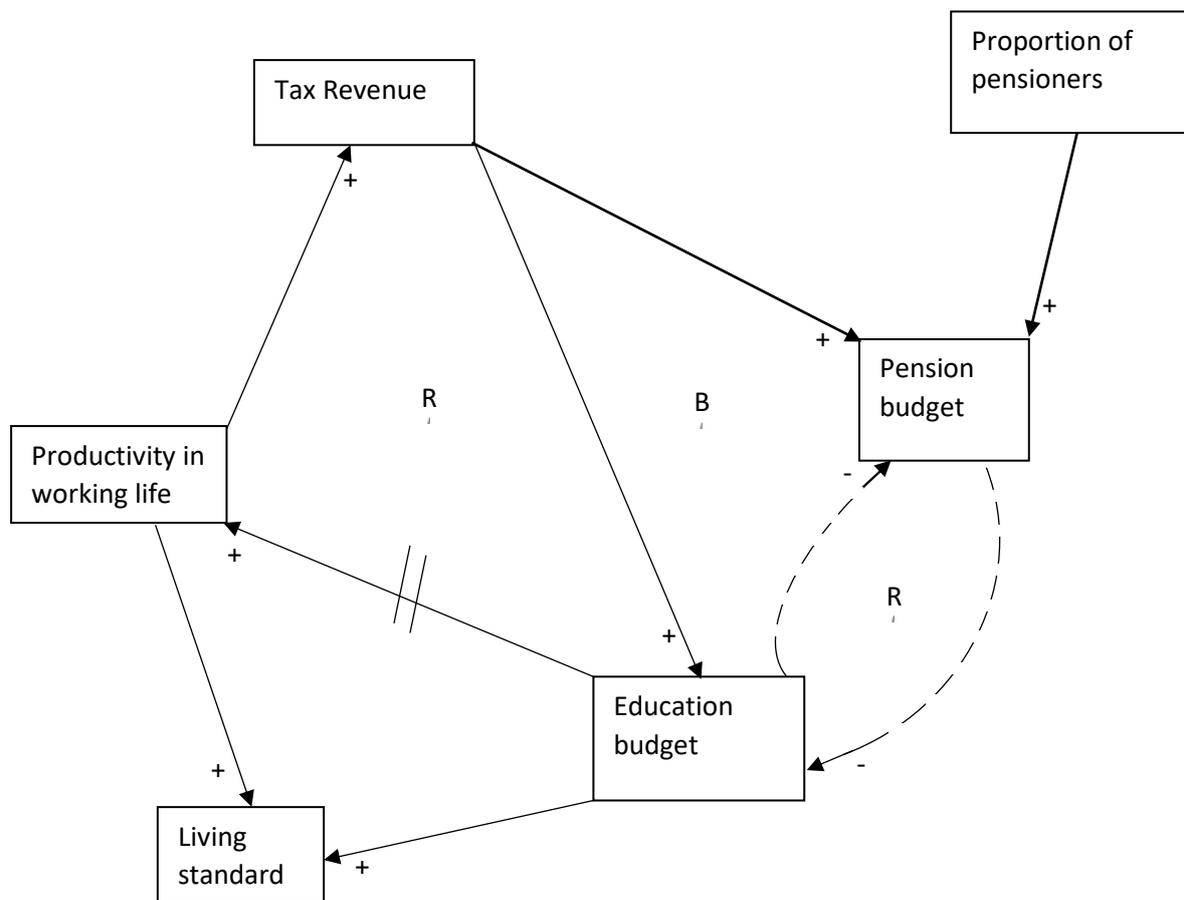


Figure 17

Figure 17 shows a systemic approach to analysing how the government's focus on education can translate into standard of life.

Tax revenue has a positive causal relationship with pension and education budgets since a greater income allows for more frivolous spending. There are negative relationships between the pension and education budgets since the tax revenue is a finite quantity each year – if one value were to rise, relative to total budget, then it is likely that the other would have to fall. Of course each value can rise simultaneously if overall tax revenue rises and similarly one can rise without the other falling if the entire rise in one sector was funded through cutting alternative areas than both pensions and education. The arrows here are dashed, as the relationships between these two variables are conditional. The percentage of the population who are of pension age must have a positive impact on the pension budget because a greater proportion of people will be claiming their state benefit.

In this paper, the proposal is being made that a better quality of education leads to a greater level of productivity in one's later life; schooling develops cognitive ability which, in

turn, improves working performance³⁷. Another product of education which could prove to be vital is the cognitive ability which will be carried into later life since this performance in later life will prove pivotal in the success or failure of raising retirement age³⁸.

Quality of education is described in this model through 'Education Budget'. While it is still a contentious point, one could argue that a larger schooling budget will correspond to an increase quality of education. This argument is threefold. Firstly, more funding can lead to a more generous teacher salary which promotes better morale and also makes the career path more appealing, motivating more individuals to enter the profession. A larger teacher pool would increase likelihood of quality teachers being available. Secondly, the budget available to each school defines the number of staff available to schools to employ so with less financial constraint schools can employ more teachers to reduce student-staff ratios. This can improve student attainment³⁹. Finally, one could make the case that funding can correspond to improved resources which allows for better learning, although this point is up for debate⁴⁰.

The last relationship in this causal loop diagram shows a positive correlation between 'Productivity in working life' and 'Tax revenue'. The reasoning behind this is that productivity leads to successful industry and hence a higher level of output. With more successful industries you expect to see more job opportunities and hence a stronger work force whom pay taxes into the state.

The *tipping point* within this model lies in the percentage of pensioners, as represented in figure 18. In the first part of this report, we verified that there will be a significant shift in the age profile of the UK and there will be hundreds of thousands of extra individuals living beyond retirement age. This manifests itself in our model as the red arrow in figure 18 and, as a result, we will see a profound impact across the rest of our model. Without some kind of reform to the pension system we will see demand for pensions escalate and the government will have no choice but to satisfy this requirement. To try and oppose the mounting debt there will be no choice but to cut the proportion of state funding offered to other areas, including education. This diagram describes the impact throughout the rest of our model. The blue line represents the initial source of the shock and the red areas imply a negative result.

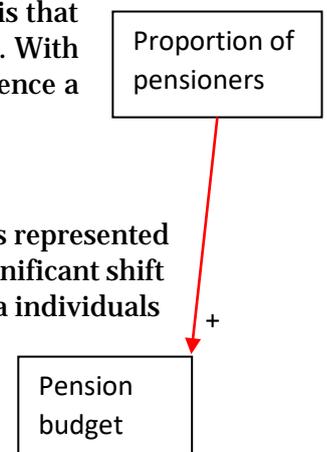


Figure 18

³⁷ Skirbekk, N. et. al. (2014). *Does Education Improve Cognitive Performance Four Decades After School Completion?* Demography, Vol. 51, No. 2, Page 619.

³⁸ Warr, P. (1994). *A conceptual framework for the study of work and mental health.* Work & Stress: An International Journal of Work, Health & Organisations, Vol. 8, Issue 2.

³⁹ Alsbaugh, JW. (1994). *The relationship between school size, student teacher ratio and school efficiency.* Education, Vol. 114, Issue 4.

⁴⁰ Hanushek, E. (1997). *Assessing the Effects of School Resources on Student Performance: An Update.* EDUCATIONAL EVALUATION AND POLICY ANALYSIS, Vol. 19, No. 2 141-164.

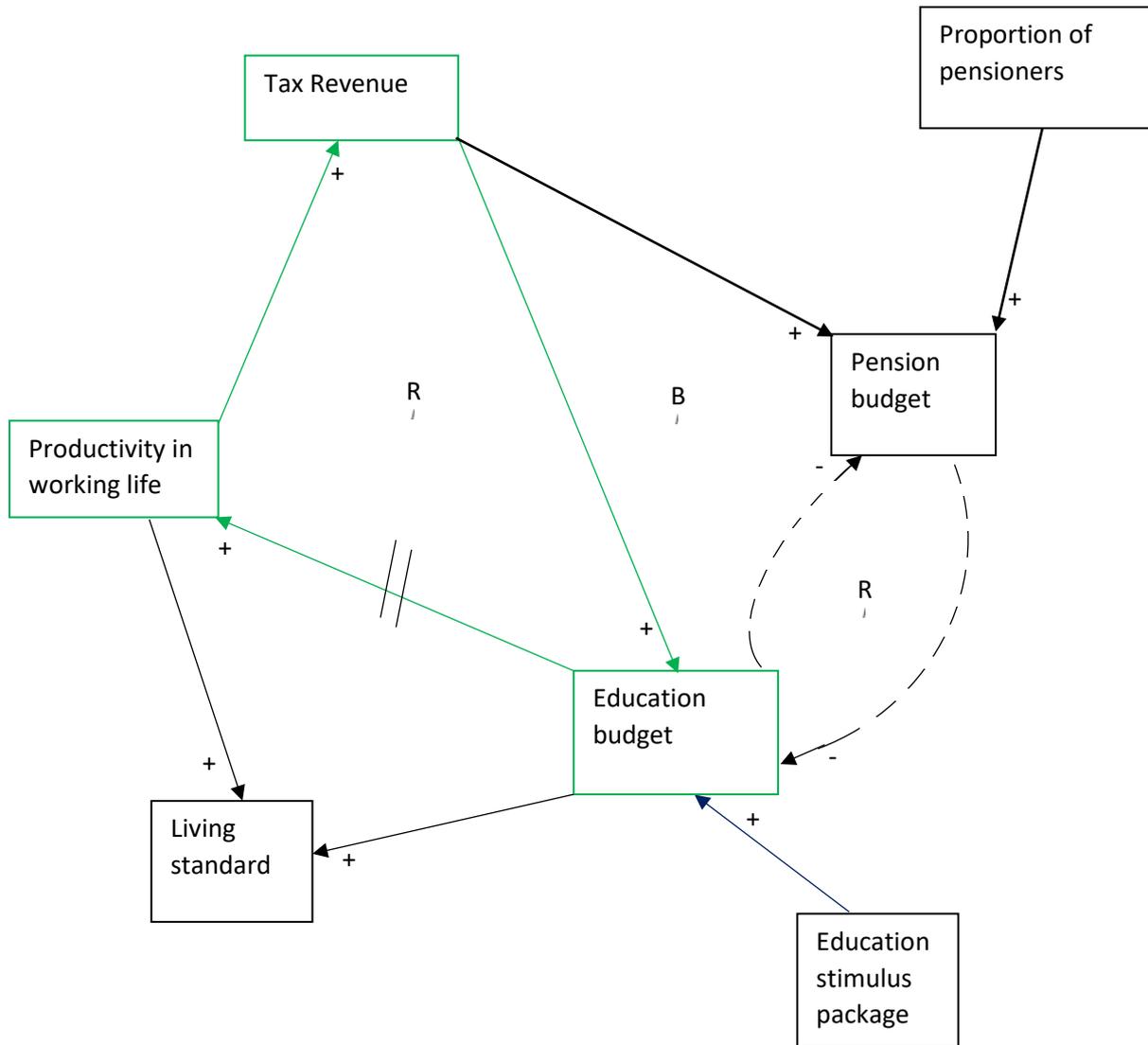


Figure 20

The blue line represents the injection of funds into the education sector and we can see the reinforcing cycle that the government would be making use of. Education positively impacts productivity, raising output and hence tax revenue which would make a greater level of funding available in all areas.

Figure 21 (below) shows the full effect.

3.3 Ageing and the NHS

Health care is a necessity, a human right, and should be available universally. We are lucky to have a publicly funded health service in the United Kingdom but how will this kind of institution survive the impending problems which surround and ageing population?

The elderly require a great deal of care. According to the NHS annual report⁴², two thirds of hospital admissions are aged 65 or over. Increase in chronic illnesses and a heightened risk of other health problems have led to financial and workload pressures on the NHS⁴³. Intensive Care Units, the most staff demanding area, are under more regular use; a study performed by DJ Sparkes (2004)⁴⁴ found that ICU admissions are rising by 2.62 admissions per 10,000 people per year. At this moment in time, that equates to approximately 17,000 extra admissions per year⁴⁵. Similarly, there has been a continuous climb of 2.6% per year, from 2001-2013, in readmissions within a month of discharge⁴².

These factors indicate an excess of NHS demand relative to the funding received from the state. The NHS is currently underfunded and by 2020 this gap in wealth could be as large as £30bn per year⁴⁶. We're already experiencing political unrest, with junior doctors rebelling against the unfair amount of work that they are being asked to do – the new contracts for junior doctors was voted against by a majority of 58% in July and we have seen strike action across January, February, March and April. The promise of a 7 day NHS is going to place severe strain on the current system.

The result of these various factors coming together is simple: patients will not be receiving the level of care that has been available in past years. This damages collective wellbeing and therefore, under the current conditions, we face an unsustainable situation.

We have already concluded that there will be a fall in the dependency rate and hence the proportion of the population whom pay income tax will be less, relative to the size of the population. The impact is a smaller tax revenue per capita and therefore relatively less funding available for the goods and service required – including the NHS. Tax must be paid on pensions in the total pension being paid to an individual exceeds minimum income allowance but this is not enough to cover the gap.

We can represent the above factors in the following model (figure 22)

⁴² NHS Commissioning Board, (2014). *Annual Report and Accounts 2013-14*. [online] Available at: <https://www.england.nhs.uk/wp-content/uploads/2014/07/nhs-comm-board-ann-rep-1314.pdf> [Accessed 26 Jul. 2016]

⁴³ Majeed, A. and Aylin, P. (2005). *The ageing population of the United Kingdom and cardiovascular disease*. British Medical Journal, Vol. 331.

⁴⁴ Sparkes, DJ. et. al. (2004). *Intensive care requirements for an ageing population – a microcosm of problems facing the NHS?* Clinical Medicine, Vol. 2, Issue 3, 263-266.

⁴⁵ Taking UK population to be 65,000,000

⁴⁶ Appleby, J. and Crawford, R. and Emmerson, C. (2009). *How cold will it be? Prospects for NHS funding: 2011–17*. The King's Fund, [online] Available at: <http://www.kingsfund.org.uk/sites/files/kf/How-Cold-Will-It-Be-Prospects-NHS-funding-2011-2017-John-Appleby-Roweena-Crawford-Carl-Emmerson-The-Kings-Fund-July-2009.pdf> [Accessed 29 Jul. 2016]

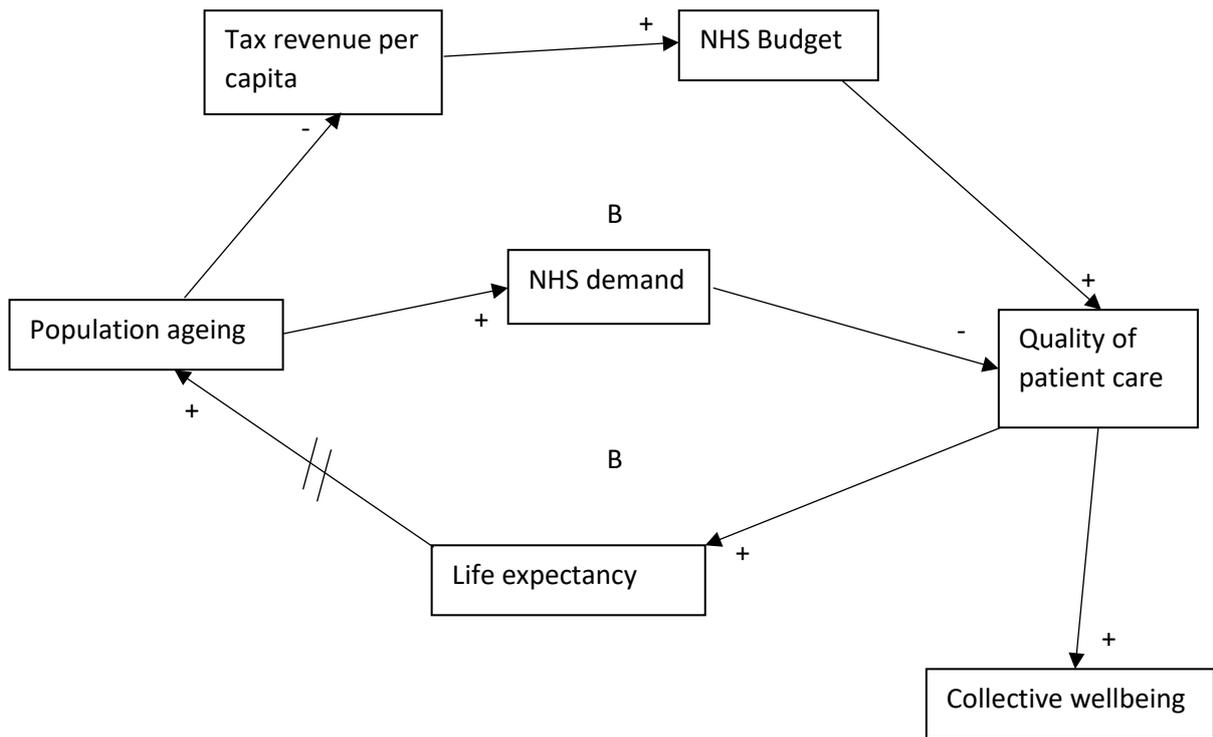


Figure 22

It was initially the growing quality of NHS healthcare that led to a rise in life expectancy and over time, compounded with falling fertility rates, this has caused the population shift. We can see two loops take shape.

Firstly, the falling tax revenue per capita will eventually cause a fall in the quality of patient care. The reasons for this were alluded to above. A smaller budget per person will provoke a damage to quality as the health care service will no longer be able to supply an adequate number of doctors and nurses. A scarcity in resources will generate a stricter level of triage and force difficult decisions around patient care. This relationship, represented in figure 23, is balancing.

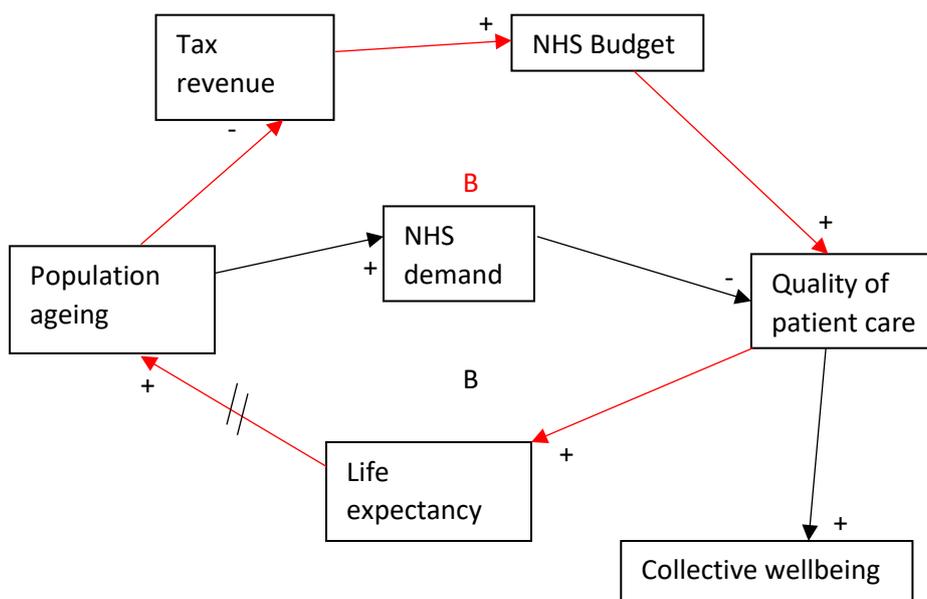


Figure 23

The result would be a decline in patient care, and hence wellbeing would suffer. Figure 24 is a general representation of how healthcare, and thus wellbeing, has changed since the creation of the NHS in 1948.

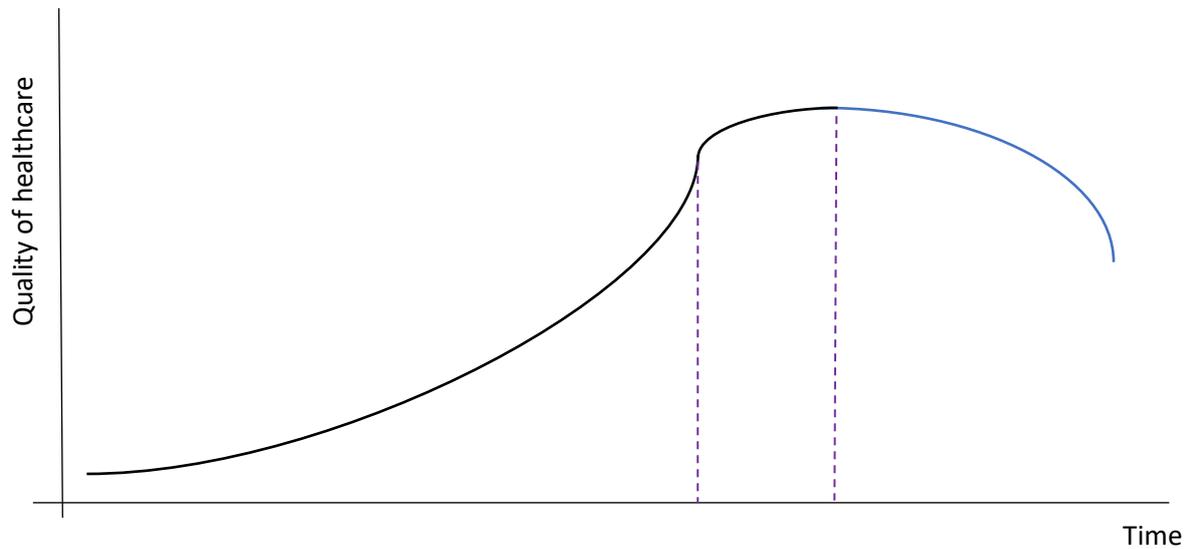


Figure 24

There was an exponential growth in quality to begin with, induced by adequate funding for the demands. We likely find ourselves somewhere between the dashed lines; while there are aspects which are improving, for example the extension of operating hours, there are many areas which are suffering, as discussed earlier. This apparent growth in quality of service is meaningless because the looming threats will mean that decline in quality is inevitable, unless there is change. As things stand, we expect to experience the fall in standards as represented in blue.

The second loop is the result of the increased demand that the NHS will face as the population of elderly grows, and this has a very similar impact.

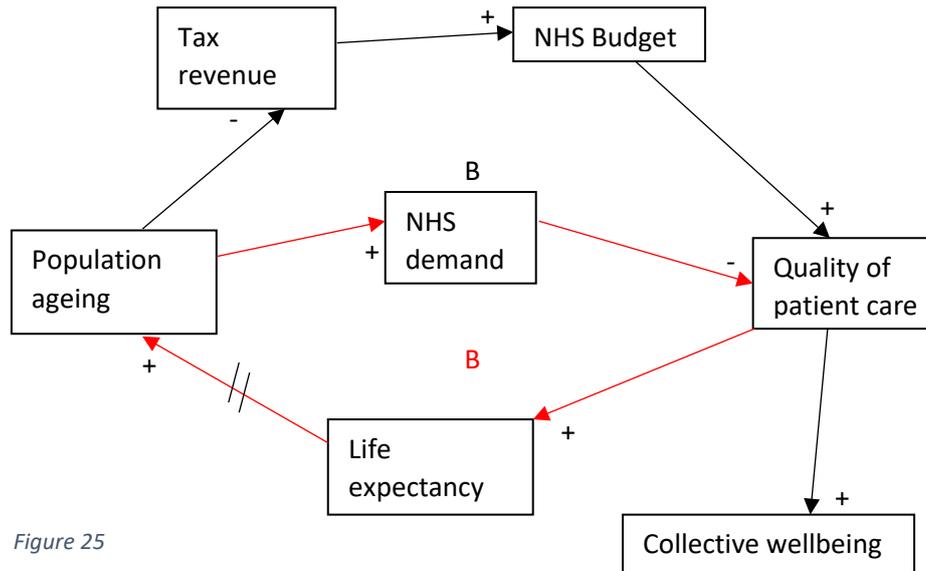


Figure 25

Quality of care will suffer in the same way as shown in figure 24, however as the health care needs of the aged becomes more prevalent at the same time as the NHS budget per capita falls, the downturn in quality of service will be more severe.

Health care is a human right and that is not up for dispute. There is no just scenario in which one can justify a reduction in services, however there must be some form of adaptation. When the NHS was created, only 52% of the population lived beyond 65 and this figure is now 86%⁴⁷. The success of modern medicine has been remarkable however we are now faced with a result of this achievement. Something must change and it cannot be reducing the quality of care available.

Instead of placing focus on the NHS itself, we might consider focusing on the wider population, i.e. *NHS demand*. By limiting the demand, we can improve the overall quality of service. As individuals we can contribute. The World Health Organisation estimates that over half of the health problems experienced by those aged 60+ could have potentially been avoided through changes to lifestyle⁴⁸. Through being active and maintaining a balanced diet, we can improve wellbeing and therefore reduce the likelihood of requiring health care. By minimising smoking and drinking we could see the same result. This is something that does not necessarily require the intervention from government as we can take these measures on a household scale. Alcohol and cigarettes are already heavily taxed to try and deter users.

There has already been a significant rise in educating the youth of the importance of healthy lifestyle so we shall wait to see whether this instigation will be successful in the long-term. There is still the possibility for the government to intervene through placing stronger restrictions on food being sold. Excessive quantities of salt and sugar are being used in

⁴⁷ Age UK, (2016). *Later Life in the United Kingdom*. [online] Available at: http://www.ageuk.org.uk/Documents/EN-GB/Factsheets/Later_Life_UK_factsheet.pdf?dtrk=true [Accessed 8 Aug. 2016]

⁴⁸ Oliver, D. and Foot, C. and Humphries, R. (2014). *Making our health and care systems fit for an ageing population*. The King's Fund, [online] Available at: http://www.kingsfund.org.uk/sites/files/kf/field/field_publication_file/making-health-care-systems-fit-ageing-population-oliver-foot-humphries-mar14.pdf [Accessed 29 Jul. 2016]

processed foods and these ingredients are known causes of many illnesses such as heart disease and diabetes. By limiting the amounts placed in food being sold at supermarkets we can reduce the levels of consumption of both and hence aid health.

Working inefficiency is rife within the hospital – manifesting itself as a lack of communication between staff or sectors, misdiagnoses, delays in obtaining details, as well as a multitude of other symptoms⁴⁹. Improving efficiency is linked with improved patient care⁵⁰. Several measures could be taken to make hospitals more efficient.

Firstly, medical technology is constantly developing at exponential rates which can have a notable impact on efficiency. This could come in the form of new treatments, new equipment or even new management styles. A new intranet server called ‘*Referral Finder*’ has been tested with a 100% approval rate from staff and a near 50% reduction in doctors reporting that they did not know the appropriate information for a referral⁴⁹. Relying on technological advance can be effective although it can be seen as somewhat of a gamble since we cannot predict what will happen.

Mentioned above was the regularity of people being readmitted to hospital within a month of discharge has continuously risen – one implication of descending service quality. This is often an unnecessary cost and so focus could be placed on this area. A greater degree of efficiency could be reached, with attention to detail surrounding discharging patients – whether this might be in the form of follow-up health checks or a stricter discharge routine. With quality long-term care homes affordably available to retirees, this discharge routine could be a more natural and gradual progression which could lower the strain on hospitals and reduce the risk of readmission. This links very strongly with the housing problem which we currently face – a matter which will be discussed in more depth.

3.4 Housing and Population Ageing

Beyond the obvious financial and social problems which are mounting, there is logistical concern circulating ageing. We are in the midst of a housing crisis – the cost of a home is crippling for young people, making the first step on the property ladder a distant dream. This decade has brought a fall in homeownership for the first time since the census began (down 15%)⁵¹ whilst the proportion of renters has catapulted up by 69%. Homelessness has also been on the rise, and while it is difficult to accurately quantify this, homeless.org.uk estimates an increase of 102% people sleeping rough from 2010-2015.

Housing trouble in young life can have a profound effect on one’s ageing life because the British culture is to treat property as an investment. We climb the proverbial property ladder and eventually downsize in retirement, pocketing the difference in property value to support us in retirement. As homeownership becomes less and less accessible, families must spend more time as renters and therefore being left worse off financially in the long term – something detrimental to their security in old age. There is clear financial issue which is caused by the current housing crisis but in this section, however, we will focus on the potential living situations of the aged.

⁴⁹ Cathcart, J. et. al. (2016). *Referral Finder: Saving Time and Improving the Quality of In-hospital Referrals*. BMJ Quality Improvement Programme.

⁵⁰ NHS, (2013). *NHS Belongs to the People: A Call to Action*. [online] Available at: <https://www.england.nhs.uk/wp-content/uploads/2013/07/nhs-belongs.pdf> [Accessed 28 Jul. 2016]

⁵¹ Shelter, (2016). *The Shortage of Affordable Homes*. [online] Available at: http://england.shelter.org.uk/campaigns/_why_we_campaign/the_housing_crisis [Accessed 1 Aug. 2016]

The core of sustainability lies in wellbeing of all actors involved in our ecosystem. As we grow old and reach a stage in which we wish to stop working, we should be able to live in comfort and this is a critical component to the psychological wellbeing of our aged population. Protecting the welfare of the elderly is not simply a practice in ensuring an appropriate level of income for them but also the provision of adequate housing and care.

As we grow old, there are certain problems which we will all eventually encounter. There is inevitably a decrement of physical and cognitive function which hinder one's ability to live independently. These, alongside chronic illness, creates a need for help with housekeeping, accessing the community and appropriate transportation⁵². With diminishing mobility, design modification to homes are often required, for example single floor dwellings, stair lifts, extra bannisters to aid movement. A 2004 study⁵³ found that the structure of the home provided the greatest bond to residential satisfaction.

There is a distinct need for a quality of care for the ageing individuals. In the United States, 38.7% of people aged 65+ report having a disability⁵⁴ – 96% of whom receive informal care for *instrumental activities of daily living* and *activities of daily living*⁵⁵. According to a survey of 1002 informal caregivers, these commonly included bathing (26%) and dressing (42%), preparing meals (59%), transportation (76%), running errands (85%) and managing medication (39%). Wellbeing improves with personal care available for the elderly individuals and hence this facility is pivotal.

On top of the formal care which is required, there is need for community access for all seniors. Solitude can have a deeply negative impact on psychological wellbeing and this is unacceptable. France has taken legislative action to fight this (Article 207, Civil Code), requiring children to remain in contact with their elderly parents. Similarly, China has passed the 'Elderly Rights Law' with the same intention. It is possible that these legislations followed data showing that these two countries have some of the highest elderly suicide rates in their respective regions⁵⁶. Ageing can be physically restrictive to one's ability to access the local community⁵², hence measures must be taken to help. It has been found that subjective and informal support has the most prominent effect on the wellbeing of individuals receiving this care⁵⁷.

With these factors and relationships in mind, the following model can be formulated (figure 26).

⁵² Golant, SM. (2003). *Do Impaired Older Persons with Health Care Needs Occupy U.S. Assisted Living Facilities? An Analysis of Six National Studies*. Journal of Gerontology: Social Sciences, Vol. 59, Issue 2.

⁵³ Phillips, D. et. al. (2004). *Factors influencing older persons' residential satisfaction in big and densely populated cities in Asia: A case study in Hong Kong*. Ageing International, Vol. 29, Issue 1.

⁵⁴ He, W. and Larsen, L. (2014). *Older Americans With a Disability: 2008–2012*. U.S. Census Bureau, American Community Survey Reports, Page 4

⁵⁵ Mitner, T. et. al. (2011). *Older Adults' Needs for Assistance as a Function of Living Environment*. Proceedings of the Human Factors and Ergonomics Society Annual Meeting, Vol. 55, No. 1, 152-156

⁵⁶ Pearson, J.L. and Yeates, C. (1995). *Suicide in Late Life: Challenges and Opportunities for Research*. International Psychogeriatrics, Vol. 7, Issue 2.

⁵⁷ Phillips, D. et. al. (2008). *Informal Social Support and Older Persons' Psychological Well-Being in Hong Kong*. Journal of Cross-Cultural Gerontology, Vol. 23, Issue 1.

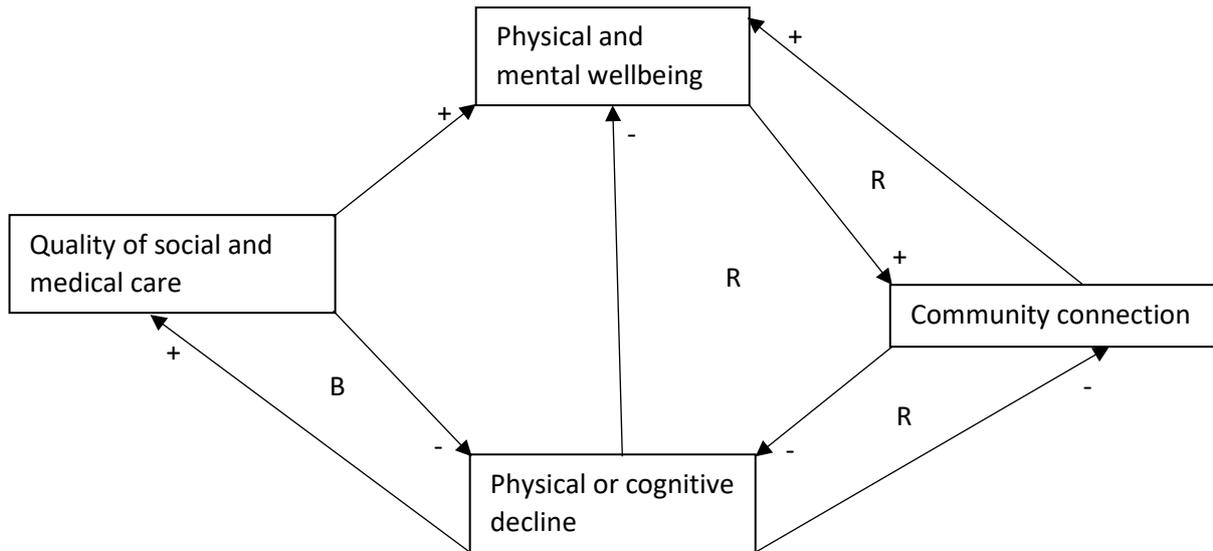


Figure 26

These relationships are the result of the study above. There are 4 loops evident here – three reinforcing and one which is balancing. As the decline in physical or mental ability is stemmed we see wellbeing benefit, and this allows for an easier access to the local community which in turn slows the physical and cognitive decrement. This loop is highlighted below (figure 27).

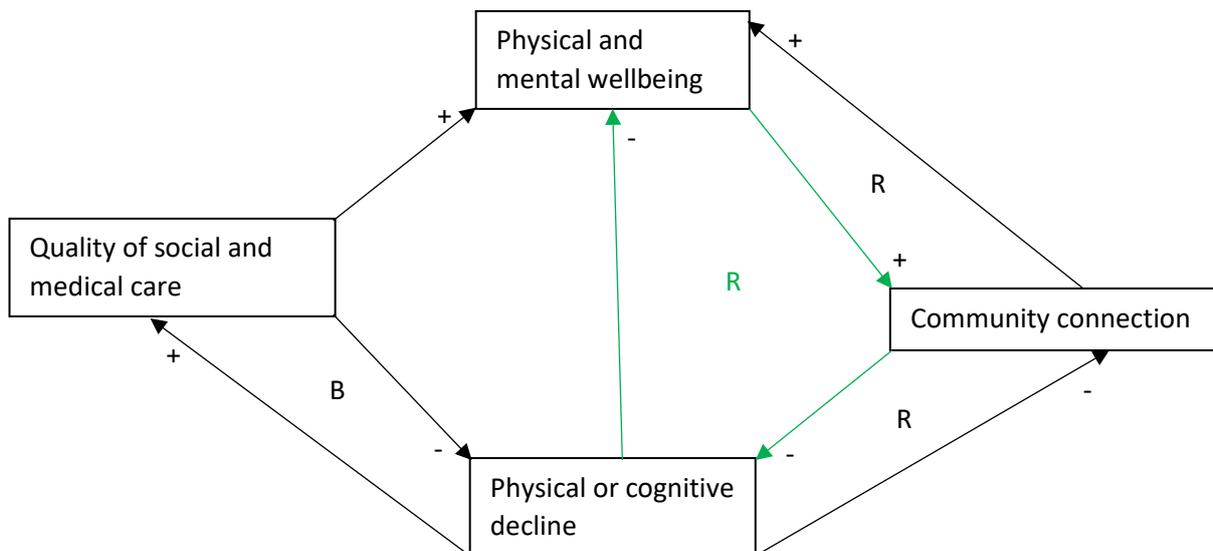


Figure 27

The two alternative reinforcing loops are found as bi-products of the rise in community connection. Cognitive deterioration has a lesser impact as the connection to the local community grows and, with this restriction being lifted, the community becomes more accessible – hence allowing further resistance to cognitive regression. Community links have been proven to be beneficial to mental wellbeing⁵⁷ and then, as wellbeing improves, the ease to which one can take an active role in one’s community grows⁵⁸. These relationships lead to

⁵⁸ Lin, N. (1999). *Building a Network Theory of Social Capital*. INSNA.

an exponential growth in community connection and physical/mental health and an exponential decay in physical/mental deterioration.

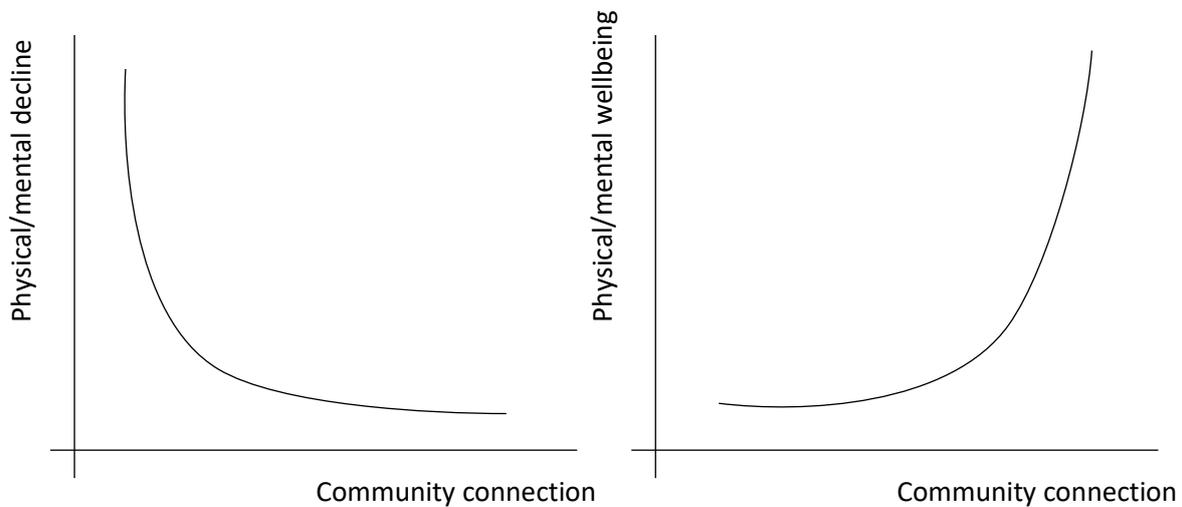


Figure 28

These three loops are prime candidates to be exploited. With an appropriately directed scheme, the state could take advantage of these relationships with the goal of maximising the wellbeing of seniors. The forms of intervention possible are many in number, with two possible areas of focus: a rise in quality of care, or attention being placed on the need to facilitate communal links.

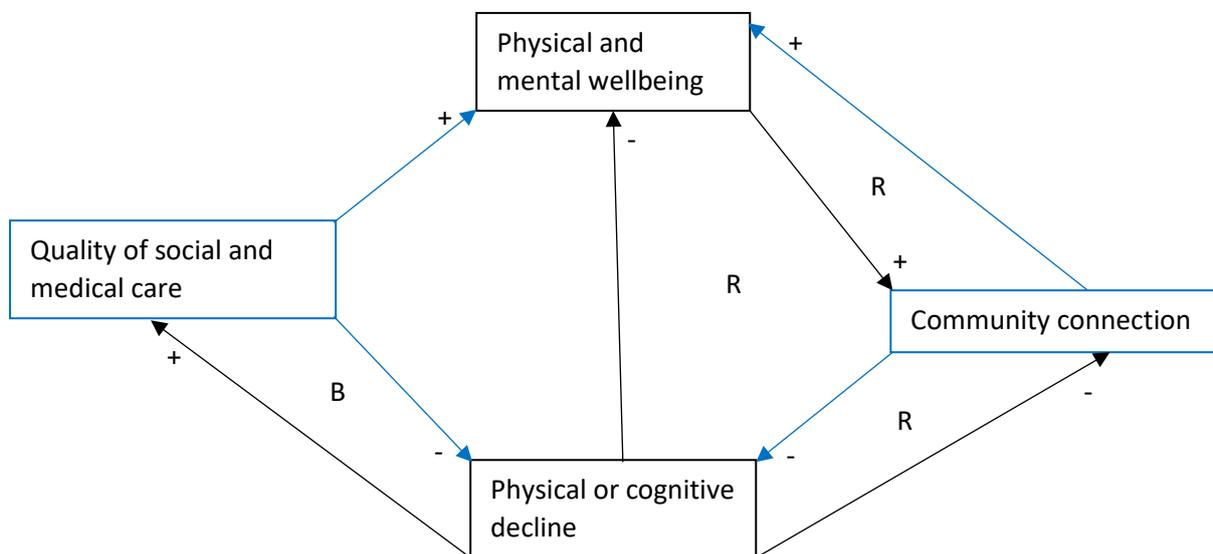


Figure 29

Figure 29 highlights the two possible areas of stimulus and their resulting impacts. They both act with the same intention and both enact the same loops. One could argue that it would be most ethical to place focus initially on the medical and social care, since these are basic human rights. In theory, the benefit from medical care is transferred into the community and hence all variables are brought into play through one policy whereas investing in elderly community access may not affect the development of formal medical care. There may be the possibility for

informal care through the local community but, while mental health would benefit from this basic social care, this would not be adequate from a medical perspective.

Something that should be addressed with caution, however, is the final causal response loop.

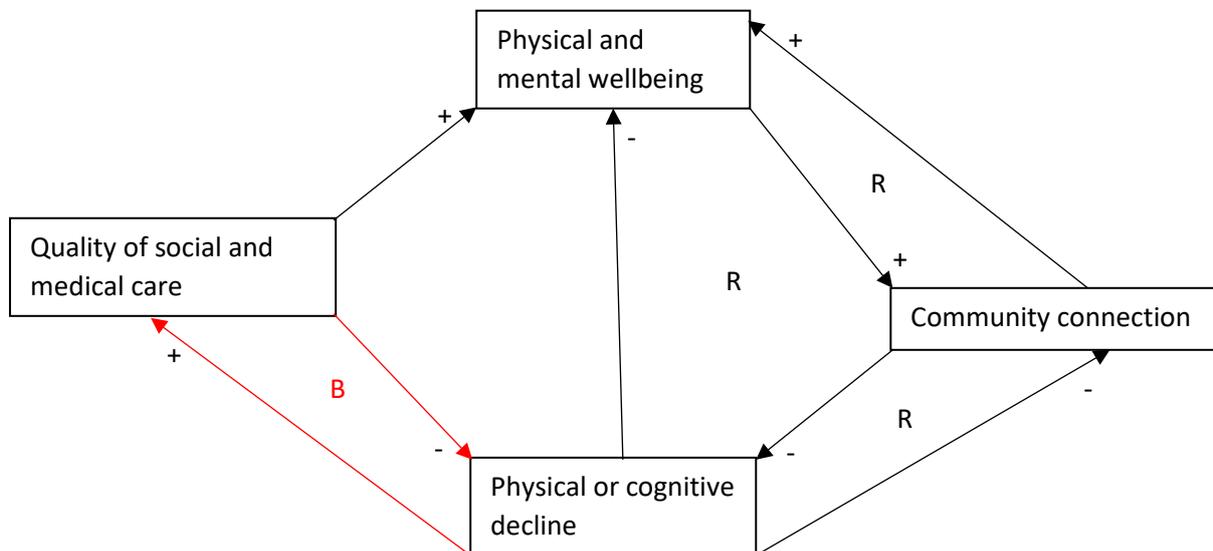


Figure 30

This relationship is highlighted above in red. The quality of medical and social care clearly causes a slowing of physical and cognitive deterioration however the alternative relationship is that when the decline in senior health is seen to be less of a problem, it is no longer prioritised for state funding, and hence quality of care suffers. This signals a positive relationship between physical/mental decline and the quality of care that is offered to aged. The compounded effect of these two relationships is a balancing of the two variables. An approximate representation of what the long term trends in the care and health decline can be seen in figure 31. The purple dashed line indicates where policymakers may take notice of the health deterioration and act by injecting a form of stimulus to the sector.

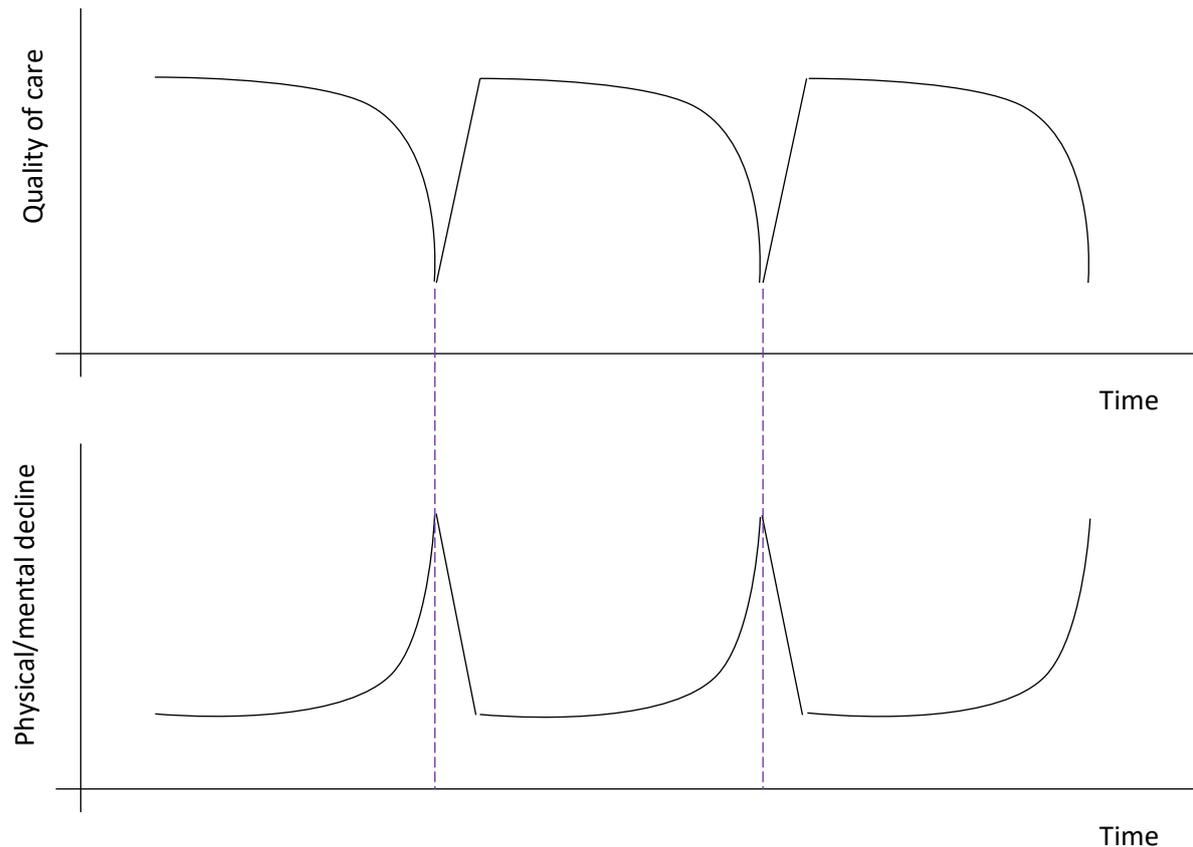


Figure 31

We can see an oscillation of the quality of care and this is not only disruptive to anyone working in or receiving the care, but it is also unfair to generations who might suffer sub-par attention while between schemes. It is key for the state to show patience and allow for continuity by protecting the funding to the care sector.

The United States began to develop retirement communities during the 1960's, offering a variety of care for a range of needs. This included: a wide spectrum of care, from intensive daily care to completely independent living, a range of meal plans, various levels of cleaning, and more. Along with this style of care, there is a large network of seniors easily accessible to all residents with communal spaces. Many of these are subsidised by government scheme, making them financially accessible for an aged population whom may not have the largest budgets.

The Danish government have implemented a similar scheme for their aged during the 1960's and this has now become a well-established method of elderly caring. Cohousing is when a group of retired individuals are brought together to share a neighbourhood with access to communal facilities. This is much like the retirement communities in the US, however takes place on a smaller scale. There is more freedom involved in cohousing as participants have control over their facilities and homes, although there is less availability for care. Being a primarily government scheme (some private cohousing plans are beginning to appear), the participants are more 'visible' to the state in precaution of independent living no longer being possible. Similarly, a community is being created on the doorstep of the residents so, as mentioned before, there are platforms of informal care between residents. Cohousing is still

on the rise but remains a successful and attractive housing niche for the elderly⁵⁹. It is worth observing that the UK and Denmark are vastly different countries. In the UK we have a far greater population and the government has a far lesser propensity for spending so it might be reasonable to say that cohousing isn't the most suiting solution for Britain.

Each of these two schemes are possibilities for the UK government to introduce – both being successful abroad, and also shining a light on care and community as previously discussed. Each scheme triggers the three reinforcing loops which have been addressed earlier in this section hence providing a necessary boost to the wellbeing of the elderly. With consistent funding we could see long-term growth in welfare bringing us one step closer to economic sustainability.

These interventions would both involve large scale building works which come with serious environmental concerns. One major constraint is the space that we have available to us on the planet and within the country. Urbanisation has already decimated the delicate ecosystem and continuing in that vein cannot be continued so large building projects must be approached with caution. Green spaces are shrinking and, for the animals and wildlife which live in these habitats, this is a death sentence. The world exists in a state of balance and we have shown complete disregard for this – in the form of deforestation, poor waste management and poor water management. As already mentioned, the economy is a subset of the ecosystem so for environmental care is key when targeting a sustainable and resilient state.

Southern Australia has seen the birth of *green retirement villages* where sustainability and affordability are central⁶⁰. Innovative building design optimises space while also allowing for the needs of elderly residents. Thermally optimum materials have been used; this is vital due to the venerable nature of the elderly in extreme temperatures⁶¹, so the large financial and environmental costs of regulating internal conditions can be crippling. With a growing number of aged, this cost will rise decidedly, so alternative means of temperature control must be considered on structural level. Likewise, water and waste management will come to the forefront of attention as the growing population will place huge pressure on the ecosystem.

There is a silver lining to this added need for sustainable, innovative homes which are suitable for aged residents who wish to downsize. A demand for the labour is needed to produce these dwellings and hence there will be job creation within the construction sector – a great boost since this often the worst hit sector of the economy during times of financial turbulence. There will be a safeguard for the livelihoods which are at risk as we sail into uncertainty.

One final alternative, which is worthy of discussion, is the culture of taking in one's parents as they reach a point at which independence is no longer possible. Filial piety – a Confucian philosophy – is far more prevalent in the Eastern world and means to respect one's elders, hence caring for them in their old age. This alternative would ease the pressure on housing, creating a faster acting alternative to the problem. The informal level of care would have a

⁵⁹ Bamford, G. (2005). *Cohousing for older people: housing innovation in the Netherlands and Denmark*. Australasian Journal on Ageing, Vol. 24, Issue 1.

⁶⁰ Xia, B. (2012). *Sustainable Retirement Living: What Matters*. Australasian Journal of Construction Economics and Building, Vol. 1, Issue 1.

⁶¹ Medina-Ramón, M. et. al. (2006). *Extreme Temperatures and Mortality: Assessing Effect Modification by Personal Characteristics and Specific Cause of Death in a Multi-City Case-Only Analysis*. Environmental Health Perspectives, Vol. 114, Issue 9.

hugely beneficial impact on health and access to a community is there since seniors would be living with family – not being subjected to solitude. Sustainability is certainly achieved since this culture can be carried through generation, as it has been in China, Japan and South Korea, amongst others. Not only would this benefit the aged, but also educated the younger generations about retirement, through greater exposure to the life of their relatives. The quantity required to pay the elderly would fall since they are in the care of their family, so bills such as food and utilities would not be quite so demanding. Creating this culture could be done through tax incentives for those who take in a retired relative, the incentives being funded a portion of the money which would no longer be needed for pensions. This solution is simple to enforce and is a cost-free method of address many of the problems which we face due to ageing – the question is: are people willing to make the required sacrifices to care for their seniors?

Summary

This report only scratches the surface of population ageing. Population ageing is an unavoidable issue, rooted in declining birth rates and rising life expectancies. Soon, the changing age profile will send shockwaves through economies, worldwide. Pension demands will soar, placing serious pressure on government budgets and hence placing the quality of public sector facilities under threat of decrement.

Change is a necessity since the present state of the world will not suffice when faced with a growing proportion of individuals beyond working age and the government must be the central figure to steer this ship. As harsh as it may appear, the state pensions must be reduced – with significant focus placed on educating the youth about life after work and saving for the future. In tandem with this, the retirement age must rise to coincide with growing life expectancies. These cuts must be made in the interest of protecting other key institutions: specifically, healthcare and education. The pension cuts could come in numerous forms, to protect wellbeing, and particular attention to quality affordable housing options could help soften the impact.

Welfare goes far beyond money so, while government measures are vital, much of the work to counter the effects of population ageing can be done at home or within communities. Quality of retirement begins with preparation and education so we must begin by working to ensure that everyone is aware of the need to save while working. If people take care of their own finances, the necessity of state pensions will inevitably fall, but this begins with the need to teach the youth about the importance of fiscal responsibility. Communities can work to create a better environment for the retired since these kinds of support are proven to be hugely beneficial to wellbeing. Families could be open to taking in their ageing parents or grandparents when they reach an age where independence has become either too dangerous, or too costly. This loving care is a sustainable solution which incurs minimum cost as people would be supporting their family on a financial and physical front, reducing requirement for state action.

Population ageing will take effect on a global scale, however the most realistic and ethical solution lies on the household level. The integral factors in our emergence, and subsequent sustainable outcome, is educating people about the matter and compassion towards members of our community.