
What are the economic issues behind the 'pension's time-bomb' currently overshadowing the European economies?

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Abstract

A pension is an accumulation of assets which enables a person to receive an income when they have retired. The pension's 'time-bomb' involves future retirees not having enough assets or income to afford an acceptable level of consumption. The main reasons for this are a lack of private savings and governments struggling to finance state pensions. In this essay I will look at the economic theory underpinning private saving and how the existing model of state pensions is breaking down.

Private savings

Franco Modigliani proposed that individuals plan their consumption and saving behaviour in the long run and choose to consume in a way which optimises their lifetime utility. This is known as the lifecycle hypothesis. (*Modigliani, 1963*) One key assumption the lifecycle hypothesis makes is that people prefer to consume similar amounts in different periods of their life. Under this theory an individual would save in a way whilst earning that enabled their future, retired self, to consume the same amount:

$$C(p) = \frac{1}{TP} \times LR$$

$C(p)$ = consumption in any period, TP = total number of periods in life and LR = life time resources. This stable consumption preference is illustrated in figure1 where an individual lives for two periods. In the first she is employed, in the second she is retired.

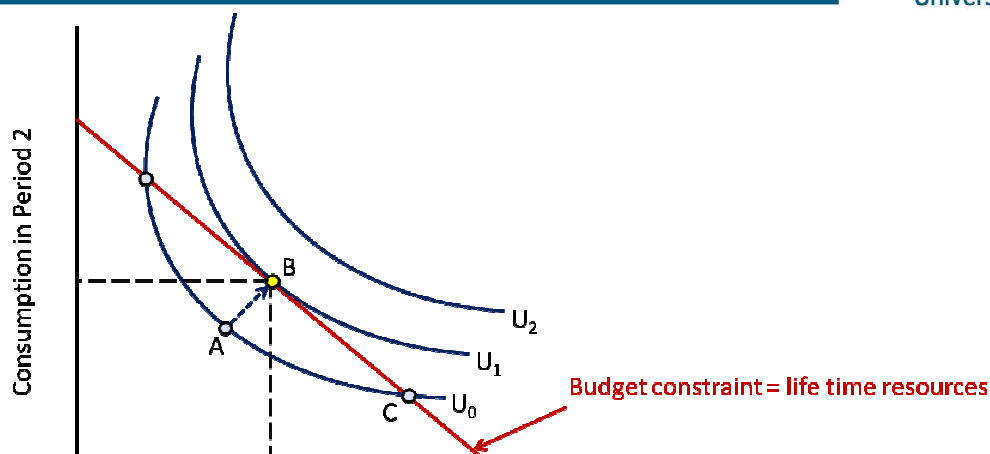


Figure 1 Consumption in Period 1

The utility curve U_0 can be achieved by consuming heavily in period 1 and little in period 2. At point A however the individual can afford to consume more in both periods thus moving to point B on the higher indifference curve U_1 . As this is the only point she can achieve the higher indifference curve subject to her lifetime resources we can conclude that her lifetime utility is maximised. $MU(C1) = E[MU(C2)]$ when $C1 = C2$ ¹. This model suggests then, that individuals do save enough to maintain consumption in retirement.

Based upon this microeconomic assumption a more holistic illustration of the lifecycle hypothesis can be drawn. Figure 2:

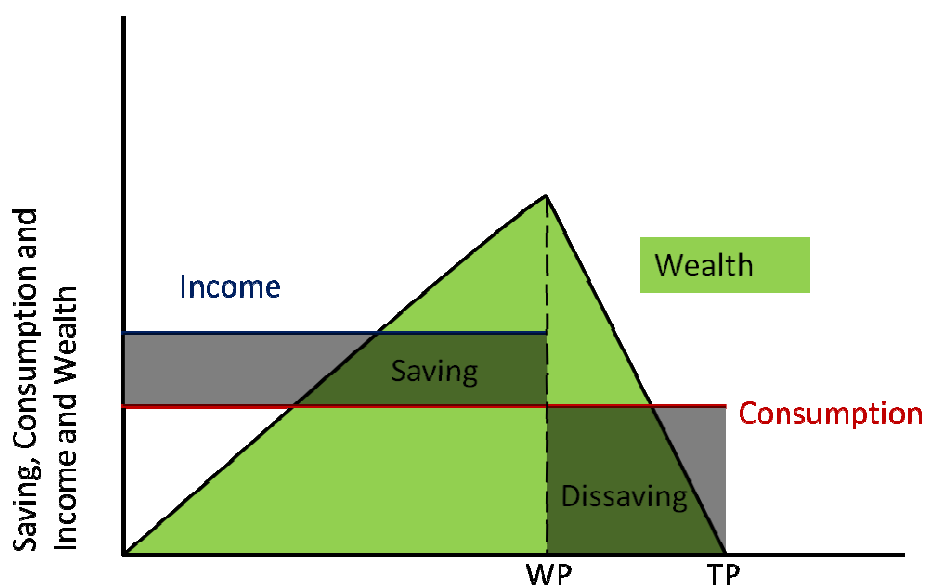


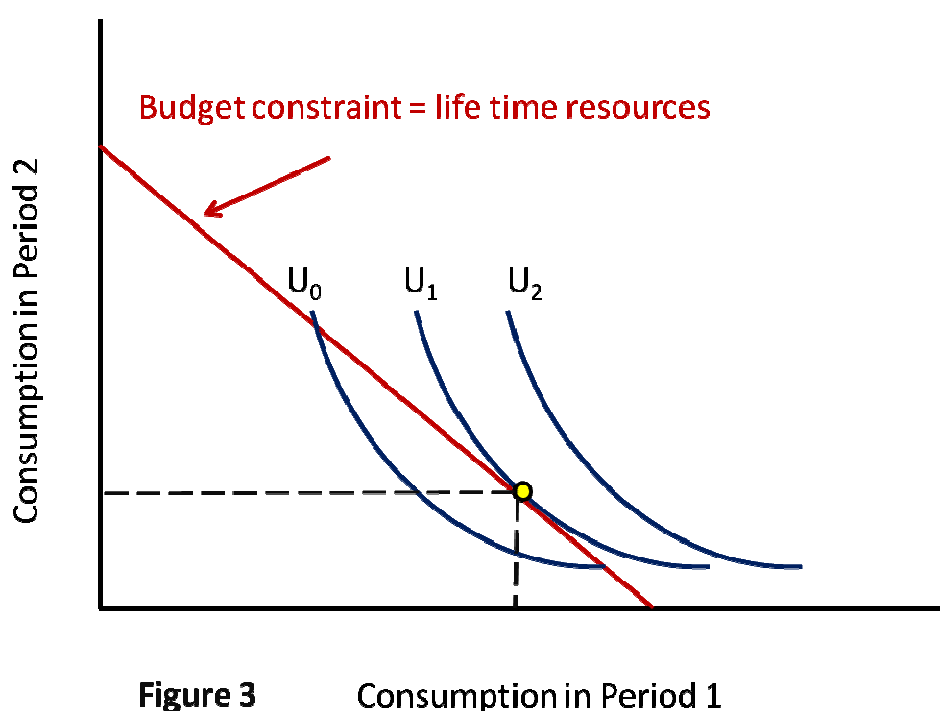
Figure 2
Source: (Fischer, 2008)

¹ E = expected

The diagram shows that consumption is constant throughout an individual's lifetime. Whilst the person is earning during her working periods (until WP) she saves and increases her wealth. Once she stops working she lives off her wealth and dissaves between WP and TP. Wealth does not necessarily imply money it could include property, financial assets and contributions made into a pension scheme.

The lifecycle hypothesis is very useful when explaining why individuals have low a marginal propensity to consume out of transitory income. They prefer to save a large proportion of it and spread the added consumption over the remaining periods of their life. However the model incorrectly predicts consumption in retirement. One study from Bernheim (2001) found a 30% decline in consumption following retirement. The model does not show what happens in the real world.

One explanation is that people discount the future to such a degree that they do not want to sacrifice consumption today for consumption tomorrow. The lifecycle hypothesis is based on the assumption that individuals have a strong preference for a stable consumption. However the theory omits a substantial time preference for spending today. If we include the time preference then, for a person who lives for two periods: $MU(C1) = E[MU(C2)]$ when $C1 > C2$. This 'retirement discounting' is a form of hyperbolic discounting proposed by Ainslie (1992). He put forward that people have a substantial time preference for the immediate future (consumption today) which is not constant over time. Figure 3 shows this.



This shows that an impatient individual will consume heavily in p1 and sparingly in p2. They discount the consumption required in p2 to give them the same utility in p1. In actual fact when this individual retires there is a good chance they will have a lower than expected utility but this is irrelevant as their saving decisions have already been made.

It is hard to measure this form of discounting and it is likely that there are many accompanying factors affecting saving for retirement. Myopia, for example, suggests that people are not forward looking and base consumption and saving behaviour on their current income. This undermines Modigliani's hypothesis that people plan their future saving in the long run. A lack of private savings puts additional pressure on the state to keep their pensioners out of pension poverty.

Governments

Across Europe the most common way of financing state pensions is through a pay-as-you-go (PAYG) system. This involves transferring income from today's workers to today's pensioners. Workers pay into the PAYG system through taxes which are then transferred to the retired on the promise that future generations will do the same. 'Contributions' to the scheme are essentially enforced savings.

For the PAYG system to not run a deficit then the average pension (p) multiplied by the number of pensioners (N) must be no greater than the proportion of income contributed per worker (cY) multiplied by the number of workers (W). (*Willmore, 2004*) Or:

$$pN \leq cyW$$

One way that the total cost of pensions can increase is by more people claiming a pension. This is exactly what is happening across Europe. When the first PAYG pension was introduced in 1889 by the German chancellor Otto von Bismarck the life expectancy was 48 while the age of retirement was 70². Nowadays the typical German can look forward to living until 80 while the retirement age has fallen to 65.³

To compensate there must be an increase in at least one of: contributions, income or workforce. For much of the PAYG history that is what has happened. Since WW2 Europe has enjoyed tremendous growth. Norway, for example, experienced approximately a 1000% increase in GDP per capita from 1945-1992

² The Economist, 2003

³ United Nations

(Maddison, 1995) this substantially raised incomes. Furthermore, in the 1940's - 1960's there was a baby-boom across Europe which increased the size of the workforce. A larger workforce along with rising incomes results in more revenue being collected for transfer.

$$p \times N \leq c \times (\uparrow y) \times (\uparrow W)$$

However since the baby-boom the birth rate across Europe has plummeted. In 1995 the birth rate had fallen to 1.5; well below the average of 2.1 required to maintain zero population growth⁴. Meanwhile, the 'baby-boomers' are now approaching the age of retirement which will further increase the number of pensioners claiming a state pension.

This has put a burden on the PAYG system:

$$p \times (\uparrow N) \leq cy \times (\downarrow W)$$

Furthermore growth predictions across Europe are expected to be 1.4% until 2050⁵ while the total cost of state pensions is predicted to double in that time⁶. An increase in incomes will not solve the problem.

Conclusion

Individuals are not saving enough and the PAYG system is breaking down. The governments have three choices to fix the PAYG system; reduce the value of the pension, lower the number of eligible pensioners or increase contributions. None of which will prove popular with voters. This is especially true in continental Europe where voters tend to have more socialist beliefs about the welfare state. Previously governments may have borrowed to finance their pensions however this no longer a solution for debt ridden countries such as Portugal, Ireland, Italy, Greece and Spain.

There is a real danger that the average pension will fall in value. A clever way to reduce the burden is to index pensions to lower levels of inflation measurements. For example CPI instead of RPI as is the case in the UK. If individuals have not built up any assets to dissave in retirement and government squeeze pension payments then there is a real danger that more retirees could end up pension poverty.

⁴ The economist, 2003

⁵ Economic Policy Committee

⁶ The Economist 2009

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