The secular stagnation equilibrium

By [Gilles Le Garrec](#) et [Vincent Touzé](#)

The economic state of slow growth and underemployment, coupled with low inflation or even deflation, has recently been widely discussed, in particular by [Larry Summers](#), under the label of "secular stagnation". The hypothesis of secular stagnation was expressed for the first time in 1938 in a speech by A. Hansen, which was finally [published in 1939](#). Hansen was worried about insufficient investment and a declining population in the United States, following a long period of strong economic and demographic growth.

In a [*Note by the OFCE (*no. 57 dated 26 January 2016 [in French]*)*,](#) we studied the characteristics and dynamics of a secular stagnation equilibrium.

A state of secular stagnation results when an abundance of savings relative to demand for credit pushes the "natural" real interest rate (what is compatible with full employment) below zero. But if the real interest rate permanently remains above the natural rate, then the result is a chronic shortage of aggregate demand and investment, with a weakened growth potential.

To counter secular stagnation, the monetary authorities first reduced their policy rates, and then, having reached the zero lower bound (ZLB), they implemented non-conventional policies called quantitative easing. The central banks cannot really force interest rates to be very negative, otherwise private agents would have an interest in keeping their savings in the form of banknotes. Beyond quantitative easing, what other policies might potentially help pull the economy out of secular stagnation?

To answer this crucial question, the model developed by [Eggertsson and Mehrotra](#) in 2014 has the great merit of clarifying the mechanisms behind a fall into long-term stagnation, and it is helping macroeconomic analysis to update its understanding of the multiplicity of equilibria and the persistence of the crisis. Their model is based on the consumption and savings behaviour of agents with a finite lifespan in a context of a rationed credit market and nominal wage rigidity. As for the monetary policy conducted by the central bank, this is set at a nominal rate using a [Taylor rule](#).

According to this approach, secular stagnation was initiated by the 2008 economic and financial crisis. This crisis was linked to high household debt, which ultimately led to credit rationing. In this context, credit rationing leads to a fall in demand and excess savings. Consequently, the real interest rate falls. In a situation of full employment, if credit tightens sharply, the equilibrium interest rate becomes negative, which leaves conventional monetary policy toothless. In this case, the economy plunges into a lasting state of underemployment of labour, characterised by output that is below potential and by deflation.

In the model proposed by Eggertsson and Mehrotra, there is no capital accumulation. As a result, the underlying dynamic is characterized by adjustments without transition from one steady state to another (from full employment to secular stagnation if there's a credit crisis, and vice versa if credit doesn't tighten much).

To extend the analysis, we considered the accumulation of physical capital as a prerequisite to any productive activity ([Le Garrec and Touzé, 2015](#).). This highlights an asymmetry in the dynamics of secular stagnation. If the credit constraint is loosened, then capital converges on its pre-crisis level. However, exiting the crisis takes longer than entering it. This property suggests that economic policies used to fight

against secular stagnation must be undertaken as soon as possible.

There are a number of lessons offered by this approach:

- To avoid the ZLB, there is an urgent need to create inflation while avoiding speculative asset "bubbles", which could require special regulation. The existence of a deflationary equilibrium thus raises the question of the appropriateness of monetary policy rules that are overly focused on inflation.
- One should be wary of the deflationary effects of policies to boost potential output. The right policy mix is to support structural policies with a sufficiently accommodative monetary policy.
- Cutting savings to raise the real interest rate (e.g. by facilitating debt) is an interesting possibility, but the negative impact on potential GDP should not be overlooked. There is a clear trade-off between exiting secular stagnation and depressing potential GDP. One interesting solution could be to finance infrastructure, education or R&D (higher productivity) through government borrowing (raising the real equilibrium interest rate). Indeed, an aggressive investment policy (public or private) funded so as to push up the natural interest rate can meet a dual objective: to support aggregate demand and to develop the productive potential.

# Redistributive policies and the demand for fairness

par [Gilles Le Garrec](#)

Six years after the onset of the Great Recession, France's economic situation is still gloomy: growth is sluggish, there are almost 3.5 million unemployed in mainland France, and the public debt is approaching the threshold of 100% of GDP (95.4% according to the 2014 Maastricht criteria according to the [OFCE](#)). One cause for satisfaction has been the ability of the social protection system to mitigate the increase in income inequality. The Gini index [1] calculated on the labour force (population age 18 to 65) shows that, between 2008 and 2011, inequality in market income increased by 2.9 percentage points while inequality in disposable income increased by only 1.8 points. To achieve this, social spending rose by 0.8 point, bringing it to 19% of GDP excluding old-age pension expenditures [2]. However, one of the fears associated with the crisis (due to its duration and magnitude) is that France can no longer afford to provide people with such a high level of social protection. Is this fear justified? Not necessarily.

Starting from the premise that in a democracy a policy can be carried out only if it has the majority support of its citizens, Meltzer and Richard (1981) suggest that increasing inequality leads to an increasing demand for redistribution, not because people have an aversion to inequality, but rather because they are motivated by their own interests. Therefore the poorer the median individual becomes in terms of income [3] compared to the average population, *i.e.* as the income distribution becomes more unequal, the greater will be that individual's interest in income redistribution. In this perspective, the increasing inequality generated by the economic crisis should result in an increase in social spending. Redistribution is thus not inflicted, but instead

should have the support of a majority of the citizens. Though attractive in its simplicity, this explanation suffers from a major flaw: the data does not show any positive correlation between income inequality and redistribution. Typically, the level of inequality measured by the Gini index (before taxes and transfers) is 0.46 in France with respect to the labour force, versus 0.475 in the US, where the level of social spending is only 13% of GDP[4]. More generally, and as is illustrated in Figure 1, this presumed correlation proves to be zero or even negative (see Perotti 1996 for an empirical review). To understand the possible weaknesses of the French social protection system, the analytical framework proposed by Meltzer and Richard (1981) will not be sufficient.

Figure. Income inequality and redistribution
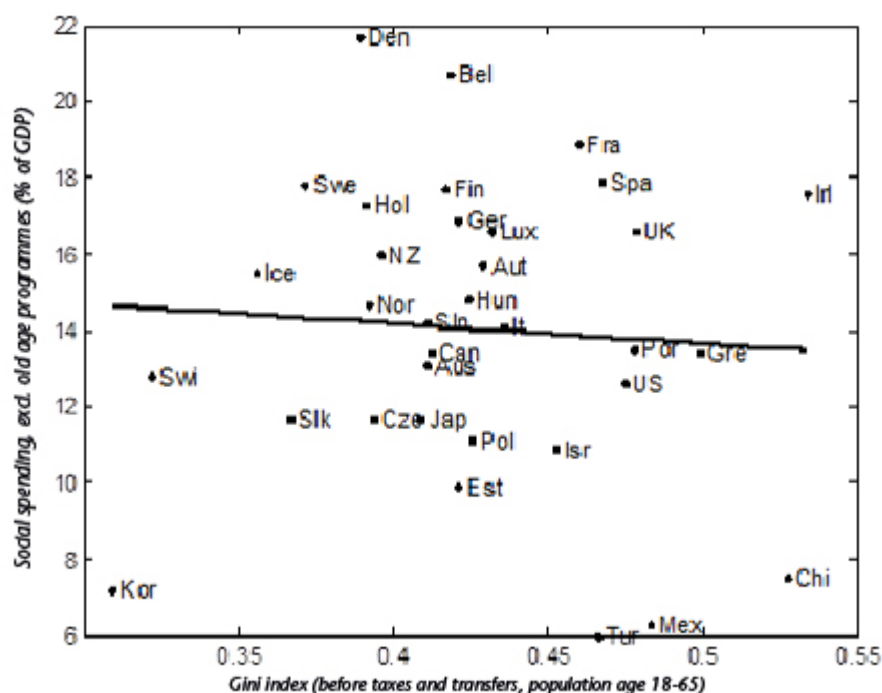
Source: OECD, early 2010s.

This discrepancy between the observed facts and the theory has spawned several lines of research[5]. In particular, the assumption that individuals are motivated solely by self-interest has been challenged by a large number of laboratory experiments. Take, for example, the ultimatum game. In this game, two anonymous subjects must agree on how to divide a sum of money. The first participant must make an offer to share

the sum. The second can then either accept or reject the offer. If he accepts, then the two share, otherwise neither gets anything. In theory, the first player, knowing that any positive offer will be accepted, should always offer the second player as little as possible. Contrary to this prediction, the results of the experiment show that many people offer 50% of the total to the second player, with an average offer of around 40%. Furthermore, any offer of less than 25% of the total has a high chance of being rejected. These results demonstrate behaviours characterized by a sense of distributive justice. When people are asked outside the laboratory setting about the reasons why someone would favour redistribution, this is the particular reasoning given. Survey data also underscore that individuals tend to give greater support to redistribution when they think that poverty is caused by factors for which the victims are not responsible (see Fong, 2001). In line with these results, the belief that luck rather than effort determines income proves to be a better predictor than income inequality of how much redistribution takes place in a country.

Thus, in order to determine the ways in which concern for others can explain the differences in redistribution observed between democracies, the theoretical literature has focused on the formation of beliefs. In the approach of Alesina and Angeletos (2005), individual preferences combine personal interest and the demand for fairness. Specifically, fairness is defined according to the principle that *each person should get what they deserve*. Knowing that income depends on both luck and the effort exerted, the authors argue that the differences between the amounts redistributed in different countries result from different self-fulfilling beliefs. Americans, expecting little redistribution, invest more in their human capital and thus create the conditions for a low level of redistribution because the role of chance is reduced in the determination of income. Conversely, Europeans, expecting strong redistribution, invest less in their human

capital. Luck is thus more important in the determination of income; individuals will therefore support strong redistribution in accordance with the principle of fairness. Furthermore, assuming that Americans and Europeans share the same preferences, Alesina and Angeletos highlight an important result: the low-redistribution American model is preferred by a majority of citizens over the European model because it produces less distortion and thus results in a higher overall income. However, this does not mean that poor people do not prefer the model with strong redistribution.

In contrast to this result which is based on the assumption that Americans and Europeans share identical preferences, Corneo (2001) showed that West Germans incorporated collective motivations into their preferences, whereas Americans were motivated only by their own interests. The intensity of a collective motivation is thus culturally determined.

In this context, building on the approach proposed by Alesina and Angeletos (2005), Le Garrec (2014) has offered a mechanism for the cultural transmission of the intensity of the demand for fairness. In accordance with the socialization process, a person's observation during childhood of the previous generation's inability to develop a fair redistribution policy will reduce the moral cost to that person of not supporting a fair policy later in life. When someone is socialized in an environment characterized by a fair redistributive policy, the demand for fairness remains strong in the person's preferences: a system with strong redistribution (as in France) is perennial and perpetuated from generation to generation. Conversely, if people are socialized in an environment where the redistributive decisions deviate significantly from distributive justice, the internalization of the norm "*individual success comes first*" reduces the weight of the moral imperative in their preferences. In this case, a system with little redistribution (as in the US) is also sustainable. In Le Garrec (2014), the choice of a system

will therefore depend on the respective histories of the nations[6].

In light of the way the canonical model of Meltzer and Richard (1981) has been extended, based on the demand for fairness observed at the individual level, can we understand the concerns expressed about the future of the French social welfare model, that is to say, a model characterized by strong redistribution? First note that in the later developments of the model, since individuals are motivated in part by their own interests, the Meltzer-Richard effect continues to exist. Rising inequality tends to increase the level of redistribution, and this receives majority support in both Europe and the United States. However, based on the Alesina-Angeletos approach, the depth of the economic crisis could weaken the French model if it leads people to believe that it can no longer be financed. In this situation, the belief could become self-fulfilling and eventually lead to a sharp reduction in the generosity of the welfare system, with a shift towards a US-style system. This interpretation of the Alesina-Angeletos model (2005) is all the more credible as the low-distribution American model seems to be preferred by most Europeans. The exposure that could result from the crisis could then serve to change beliefs. This perspective, however, is not present in Le Garrec (2014), and rightfully so as preferences co-evolve with the social protection system. A French person will (on average) prefer strong redistribution because his or her preferences express a strong demand for fairness. From this point of view, the high redistribution model, like the low redistribution one, seems very durable. Nevertheless, in Le Garrec (2014) the sustainability of the high redistribution model requires a minimum consensus in society on the causes of injustice in order to ensure a moral standard that is relatively strong. However, the economic crisis in Europe is characterized precisely by strong disagreement about its origins: excessive debt on the part of households or government, fiscal austerity, monetary

conservatism, divergence in competitiveness with a single currency, a lack of solidarity among nations, etc. From this perspective, the crisis could jeopardize the French model by weakening moral standards. Ultimately, in contrast to the approach of Meltzer and Richard (1981), the approaches of Alesina and Angeletos (2005) and Le Garrec (2014), which go more deeply into people's motivations, offer keys to a different and complementary understanding of the potential dangers that could face the French social security system as a result of the economic crisis.

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[1] The Gini index is based on a comparison between proportions of the population and their combined income. A value of 0 represents perfect equality, a value of 1 complete inequality.

[2] As the pension system is not aimed at reducing income inequality, but at providing deferred wages on the basis of what has been paid in, it is best to remove these expenditures in order to properly assess the capacity of social spending to reduce these inequalities.

[3] 50% of individuals have an income that is higher than this person's, and 50% lower.

[4] Social spending (and taxation) is also less progressive in the United States than in France. Thus, social spending of 1% of GDP would reduce the Gini index by 1.74% in France compared with 1.46% in the United States.

[5] See Alesina and Glaeser (2004) and Acemoglu *et al.* (2013) for an overview of the various extensions made to the canonical model.

[6] It is beyond the scope of this note to analyze the historical facts that would help explain the convergence towards one type of social protection model rather than another. For this, please refer to the work of Alesina and Glaeser (2004).

Increased longevity and social security reform: questioning the optimality of individual accounts when education matters

par [Gilles Le Garrec](#)

In 1950, life expectancy at birth in Western Europe was 68 years. It is now 80 years and should reach 85 by 2050. The downside of this trend is the serious threat that is hanging over the financing of our public retirement systems. Financed on a pay-as-you-go (PAYG) basis, *i.e.* pension benefits are paid through contributions of contemporary workers, the systems must cope with an increasingly large number of pensioners compared to the number of contributors. For example, leaving the average age of retirement unchanged in France would lead to a ratio of pensioners to workers (the dependency ratio) of 70.1% in 2040, whereas this ratio was 35.8% in 1990. Changes are unavoidable. Maintaining the current level of benefits within the same system in the near future requires to increase either the contribution rate or the length of contribution (by delaying the age of retirement).

This financing problem calls into question the role of PAYG retirement systems in our societies. For instance, by evaluating the real pre-tax return on non-financial corporate capital at 9.3% and the growth rate over the same period (1960 to 1995) at 2.6%, Feldstein[1] unequivocally advocates the

privatization of retirement systems and a switch to fully funded systems. He assesses the potential present-value gain at nearly \$20 trillion for the United States. However, beside the change in the nature of the risk,[2] replacing conventional PAYG systems by financial – or funded – defined contribution (FDC) systems would certainly involve prohibitive social and political costs because one generation will have to pay twice. Implementing such a reform in Western democracies thus appears difficult. For that reason, in recent years a large focus has been put on non-financial – or notional – defined contribution (NDC) systems as legislated in Sweden in 1994. NDC systems are PAYG systems that mimic FDC systems. Individual contributions are noted on individual accounts. Accounts are credited with a rate of return that reflects demographic and productivity changes. Obviously, replacing conventional PAYG systems by NDC systems does not address the main concern of Feldstein, that is, the low return associated with the PAYG financing method. However, supporters of NDC systems claim that conventional systems, by linking pension benefits only partially to contributions, distort individual behaviours, inducing reduced work efforts or earlier retirements. In addition, they claim that only an explicit defined contribution system will be able to stabilize contributions in spite of aging populations.

Looking at the empirical facts, the supposed inefficiency of conventional retirement systems must be reconsidered. Firstly, even if their pension benefits are linked to partial earnings history, most conventional systems are close to actuarial fairness[3] as NDC systems because high-income earners live longer and have steeper age-earnings profiles. Secondly, stabilizing contributions can be achieved similarly within the scope of more conventional defined benefit systems, as seen in the "point system" in France or in Germany. In that case, the unit of pension rights is earnings points (not euros) and can

be adjusted according to demographic and productivity changes, as in an NDC system. Cleverly designed conventional retirement systems can often do the same job as NDC systems. Finally, empirical findings from Sala-i-Martin[4] and Zhang and Zhang[5] tend to support a positive impact of retirement systems on economic growth through the human capital channel.

To explain the positive link between PAYG retirement systems and economic growth that is suggested by the empirical findings, previous authors have then focused on the human capital channel, and more particularly on parental altruism. In this strand of the literature, PAYG retirement systems result in higher economic growth because they provide an incentive for altruistic parents to invest more in their children's education, even if investment per child remains insufficient to be socially optimal. In addition, they also provide an incentive for parents to have fewer children. In that context, when private behaviour is not observable, Cigno, Luporini and Pettini[6] show that a second-best policy would be to provide parents with subsidies linked to the number of children they have and their future capacity to pay taxes. To that end, Cigno[7] suggests that unconventional children-related pension systems be added to conventional retirement systems so as to allow individuals to earn a pension by raising children and by investing in their human capital. Introducing such an unconventional system could stimulate both fertility and economic growth. In France, the 10% bonus on pension benefits for parents of three children or more is such a pension-based fertility subsidy. However, for both reasons of economy and equity[8], these subsidies are taxed since the reform of 2013, with the risk of lowering the fertility incentives. This latter reform will imply more profound changes as from 2020 proportional subsidies will be replaced with payments only given to women on a per-child basis (the first child inclusive).

Beyond the impact of PAYG systems on parents' behavior,

results have first appeared mixed when considering people investment in their own education. On the one hand, Kemnitz and Wigger[9] and Le Garrec[10] have shown that conventional retirement systems provide an incentive for people to be trained longer because training results in steeper age-earnings profiles. On the other hand, Docquier and Paddison[11] have shown that in reducing the actualized return to education conventional retirement systems dissuade less able people from investing in their education. By embedding both channels, Le Garrec[12] shows that the positive impact dominates the negative one so that the average length of training and then economic growth was increased with conventional retirement systems, at least for low contribution rates. In the spirit of Cigno, this result suggests that a desirable feature of any retirement system would be to subsidize people who invest in their own education by linking pension benefits to the best — or last — years' average annual earnings, not to full lifetime average earnings as in NDC systems. From that perspective, the Balladur reform of 1993 inFrance went in the wrong direction. Indeed, in the private sector earnings-related benefits were linked to the ten best years before the reform, then gradually to the 25 best years after.

Starting from the empirically supported assumption that conventional retirement systems are close to actuarial fairness and yield more economic growth, it is then not straightforward to determine whether the introduction of individual accounts and the stabilization of contributions are desirable objectives. To analyze this issue and the relevancy of the switch from conventional unfunded public pension systems to notional systems we have extended in a recent article[13] the social security-growth literature in two directions. First, following Le Garrec (2012), we consider investment in human capital through both the proportion of

individuals who decide to invest and the time they invest. With more general specifications, we can provide explicit and general conditions so that the positive effect associated with the lengthening of training may be dominated by the negative effect, *i.e.* the decrease in the proportion of educated individuals. We then show that economic growth may exhibit an inverse U-shaped pattern with respect to the size of an actuarially fair retirement system in which pensions are linked to the best – or last – years' average annual earnings, while an NDC system has no impact on economic growth. Second, we consider the aging process, not by assuming decreased fertility as it is usually done in the literature, but through increased longevity. This has important consequences. Indeed, as increased longevity raises the value of investments that pay over time, it generates stronger incentives for people to invest in their education[14]. Therefore, social security interacts with longevity in determining the individual level of investment in education. We then show that increased longevity may raise the size of the conventional retirement system rate that maximizes economic growth.

For policy-making, the message in Le Garrec (2014) is clear: increased longevity should be associated with an increase in the size of the existing conventional retirement systems, not with a switch towards NDC systems. However, there is no guarantee that the political process leads to the optimal size. According to Browning[15], there even are good reasons to think that the political process leads to a PAYG size exceeding the growth-maximizing level. Indeed, he showed that workers tend to increase their support for the PAYG retirement system as they approach retirement. Consequently, considering that the pivotal voter is middle-aged worker, by definition closer to retirement than a young worker, this could strengthen support for a PAYG size that exceeds the growth-maximizing (or the welfare-maximizing) level. Does this mean that in practice an NDC system is preferable to a conventional system? Not necessarily. Indeed, an assessment that the

conventional PAYG size exceeds the growth-maximizing level does not necessarily mean that an NDC system would allow greater economic growth. Quite the opposite, if we give credence to the empirical results reported by Sala-i-Martin (1996) and Zhang and Zhang (2004), economic growth would be slowed down when switching to an NDC system.

Starting then from a situation where conventional PAYG systems yield more economic growth, what may happen with increased longevity. Firstly, as the pivotal voter approaches retirement, it is likely that the PAYG size supported by a majority will increase. Two configurations may then occur. If the effective PAYG size increases less or only slightly more than the growth-maximizing level, the superiority of a conventional system over an NDC system may be preserved. In that case, a switch towards NDC systems will not be optimal. By contrast, if the effective PAYG size increases significantly more than the growth-maximizing level, conventional retirement systems may become harmful for economic growth. In that case, as suggested by Belan, Michel and Pestieau[16], a Pareto-improving transition towards a fully funded system may exist if it results in a significant increase in economic growth. More likely, if such a transition does not exist, a switch to NDC systems can then be considered as a desirable policy for increasing economic growth and social welfare.

In Le Garrec (2014), all the solutions coping with increased longevity have been considered while keeping the calculation of pension benefits actuarially fair. If the main problem of existing retirement systems is that they are too large, another solution would be to make the system more progressive. Indeed, as highlighted by Koethenbuerger, Poutvaara and Profeta[17], the size of the retirement system chosen by the median voter tends to decrease as the link between contributions and benefits is loosened. It is a fact that

progressive systems appear smaller than actuarially fair systems. However, as argued by Le Garrec[18], more progressivity also leads to fewer incentives for people to invest in their education. At this stage, the impact of introducing more progressivity on economic growth appears uncertain, unless it also strengthens majority support for public education funding, as argued by Kaganovich and Meier[19]. From that perspective, incorporating public education in the analysis appears to be a promising avenue for further research.

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[1] "The missing piece in policy analysis: Social security reform", *American Economic Review*, 1996 (86-2), pp. 1-14.

[2] The risk is linked to the instability of financial markets in FDC systems while it is linked to the forecast of the correct evolution of the dependency ratio in PAYG systems. In the latter, there is also a kind of political risk as transfers go from a majority, the workers, towards a minority, the pensioners.

[3] Except in Anglo-Saxon countries where pensions are weakly related to earnings. Strictly speaking, a retirement system is said actuarially fair if its return is equal to the interest rate. Considering that the economic growth rate, which is the retirement system return, is lower than the interest rate, retirement systems could be described more properly as quasi-actuarially fair.

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