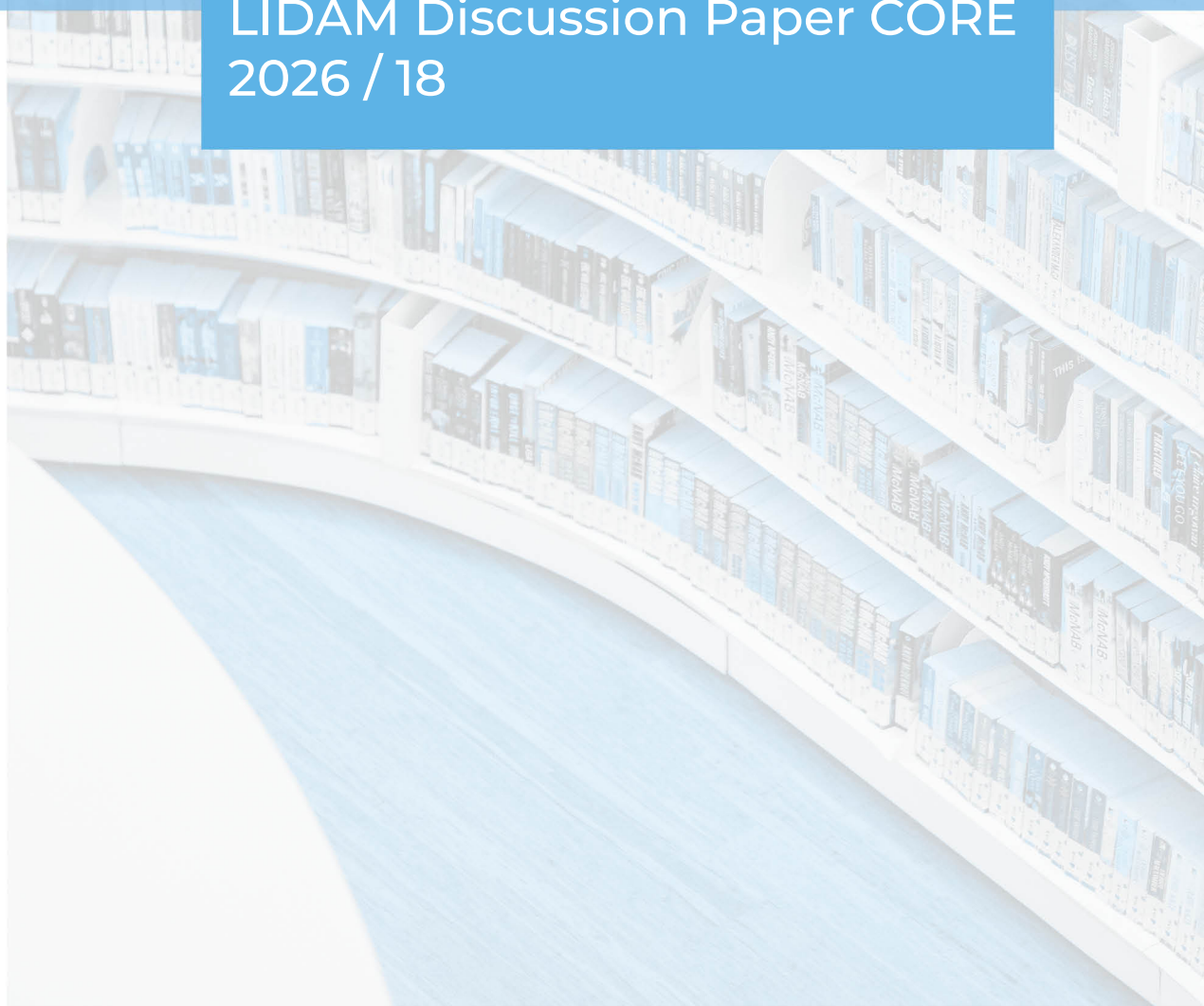
WHY DO WE NEED A FULL FLEDGE SOCIAL INSURANCE FOR OLD AGE DISABILITY?

Pierre Pestieau

LIDAM Discussion Paper CORE
2026 / 18



UCLouvain

CORE | LIDAM
Louvain Institute of Data Analysis and Modeling in economics and statistics

CORE

Voie du Roman Pays 34, L1.03.01

B-1348 Louvain-la-Neuve

Tel (32 10) 47 43 04

Email: immaq-library@uclouvain.be

https://uclouvain.be/en/research-institutes/lidam/core/core-discussion-papers

Why do we need a full fledge social insurance for old age disability?*

Pierre Pestieau**

Abstract

This paper pursues two aims. It first surveys the concerns surrounding the anticipated evolution of the three pillars of support for loss of autonomy, examining in turn the assumptions, projections, and underlying tensions that shape each of them. It then turns to the design of a comprehensive social policy framework — one capable of ensuring that the widest possible segment of the population enjoys equitable access to long-term care, in a manner that is both consonant with family solidarity and responsive to market dynamics.
Keywords: long-term care, disability risk, informal care, social insurance
JEL classification: H2, H5

1. Introduction

It is widely accepted that the well-being of dependent elderly people rests on two types of care: informal care, provided by family members and close relatives, and formal care, of a market-based nature, funded by the State, the market, or sometimes the family itself. It is well established that these two modalities can be either complementary or substitutable, depending on the severity of the dependency. Be that as it may, the role of the family is clearly distinct from that of the market and the State.

The outlook in the field of old age disability is concerning in two respects. On the one hand, the hitherto central role of the family appears set to diminish, much as occurred when public and private pensions gradually took over from family solidarity in the area of retirement. On the other hand, demographic ageing is expected to trigger a sharp rise in demand for care among dependent persons — a demand against which the three pillars of the State, the family, and the market appear singularly ill-equipped. The market remains, and will in all likelihood continue to remain, marginal. The family is gradually stepping back. As for the State, the ultimate safety net in this domain, it finds itself paralyzed by deep structural deficits.

* *I gratefully acknowledge the financial support provided by the Chair "Marché des risques" of the FdR/SCOR Foundation.*
** *CORE, U. de Louvain, HEC, U. de Liège and PSE, Paris.*

In this article, we will proceed in two steps. We will first revisit the various assertions regarding the expected evolution of the three pillars of support for old age disability. In a second step, we will address the design of a social policy aimed at ensuring that the greatest number of people have access to long-term care in harmony with the family and the market.

2. State of the Question

2.1. The Decline of Family Care

The informal care provided by children to their dependent parents has long been a central pillar of social protection systems, particularly in Mediterranean European countries. However, a convergence of demographic, economic, and cultural transformations today supports the hypothesis of a gradual reduction in this form of family solidarity over the coming decades.

The demographic transition is generating a growing structural imbalance between the number of potential caregivers and the number of dependent individuals. The widespread decline in fertility, which began in the 1970s and has continued to the present day in most European countries, mechanically reduces the number of children able to support their aging parents. Whereas a previous generation could count on three or four children to share the caregiving burden, today's parents often have only one or two children, or none at all for a growing proportion of the population.

This scarcity of family caregivers is paradoxically accompanied by a lengthening of the duration of dependency. Medical advances have enabled a significant increase in life expectancy, without guaranteeing an equivalent extension of healthy life. The result is a deterioration in the ratio of caregivers to care recipients, placing increasing pressure on family solidarity.

Furthermore, today's children face stronger economic constraints than previous generations. Job insecurity, rising debt — particularly linked to housing costs — and stagnating real wages limit their capacity to take on a caregiving role. This situation creates a double obstacle: on one hand, the financial resources needed to supplement care (adapting the home, using professional services) are lacking; on the other, reducing professional activity to care for a dependent parent is increasingly difficult to contemplate without further weakening one's economic situation and retirement entitlements. The "sandwich generation" phenomenon — caught between caring for aging parents and supporting children — further compounds this constraint.

Cultural transformations observed over recent decades have also altered social norms regarding family obligations. The individualization of life trajectories, the valorization of personal autonomy, and the redefinition of intergenerational bonds have contributed to weakening the sense of unconditional moral obligation toward one's elders. This shift does

not reflect a weakening of filial affection, but rather a redefinition of what constitutes a "good" relationship between parents and children. Care provided to parents is increasingly perceived as a personal choice rather than an inescapable duty, and the personal or professional sacrifices it entails are increasingly questioned.

Growing geographic mobility is another determining factor. The globalization of career paths and the need to relocate to find employment have increased the distances between generations. It is now common for children to live hundreds or even thousands of kilometers from their parents, making regular, close proximity care impossible. This geographic dispersion profoundly transforms the nature of informal care, which is then often limited to administrative or emotional support from a distance, while hands-on care must be entrusted to professionals. Even when a geographic return might be feasible, it would entail professional and social costs that are increasingly difficult to justify in light of contemporary norms.

Recent research on caregiver burden has also highlighted the human and social costs of informal care. Physical and psychological exhaustion, social isolation, increased risk of depression, and family tensions are now well documented. This growing awareness is changing the behavior of both parents and children. Many parents express a desire not to become a burden to their children and prefer to turn early to professional solutions in order to preserve the quality of their emotional relationship. For their part, children, aware of these risks, seek alternatives that allow them to reconcile filial responsibility with the preservation of their own life balance.

There is limited research on trends in informal care for dependent parents. Some studies show signs of decline in the United States. For example, Janus and Doty (2018), analyzing data from 1982 to 2004, found that spouses and children were increasingly less likely to take on a caregiving role, resulting in a reduction in the number of spousal and child caregivers per disabled elderly person. This landmark study draws on both the National Long-Term Care Survey (1982–2004) and HRS data (2000–2012). Using more recent data, Wolff et al. (2025) show that adult children accounted for 40.7% of family caregivers in 2022, reflecting a significant decline since 2011.

Perelman and Pestieau (2026) examine the prospects for informal care in Europe. To this end, they draw on data from the SHARE survey, which allows for comparison of the situation and dynamics at work across different European countries. They study the determinants of informal care and, based on the expected evolution of these determinants, are able to anticipate that the current decline in informal care will continue in the future.

2.2. The Difficulties of the Long-Term Care Insurance Market

Probably the most debated question when it comes to private insurance for long-term care is why dependency risk is so poorly covered by the market. It is widely accepted that the need

for long-term care is an insurable risk. It affects the majority of individuals, and it can be defined and measured. Since a growing number of elderly people will live longer and face the risk of dependency in the coming years, the benefits of ensuring this risk from various perspectives — particularly that of the dependent person and their family caregiver — should be self-evident. And yet, in the United States, only 3% of long-term care expenditure is financed by private insurance. Moreover, only 7 million out of 86 million people aged 55 and over have private insurance (Nordman, 2016). This weakness in the long-term care insurance market is even more striking in other OECD member countries.

How can we explain the lack of demand for insurance that covers a risk faced by the majority of individuals? The usual reasons for this low demand include adverse selection, moral hazard, and the existence of public programs that may crowd out private demand for such insurance[1]. To these explanations, a number of additional factors can be added: unattractive reimbursement rules, particular preferences, as well as behavioral biases and a lack of information.

Pauly (1990) develops a particular type of moral hazard for private long-term care insurance, which he calls intrafamily moral hazard. According to this author, elderly people fear that if they take out private insurance, their children will be inclined to send them to nursing homes as soon as they are no longer able to act independently. Insurance could indeed induce such behavior, since it reduces the cost of institutionalization relative to the cost of personal care. Elderly people who prefer to receive informal care from their children rather than formal care may therefore choose not to take out insurance.

On the question of moral hazard, Trainar (2024) challenges the prevailing notion that dependency risk is easily insurable. He highlights the inherent ambiguity of this type of risk. As a result, contracts designed to mitigate dependency risk often exhibit a fundamental asymmetry, thereby creating potential for moral hazard.

The availability of social assistance — such as Medicaid in the United States or the APA in France — can reduce demand for private long-term care insurance. Medicaid is designed to provide coverage only to the very poor. To qualify, one must have almost no liquid assets and low income. Yet there are numerous examples of middle-class elderly individuals impoverishing themselves by spending down all their assets during the first months of a nursing home stay in order to qualify for Medicaid — a process known as "spending down."

Concepts from behavioral economics, such as "loss aversion" (the idea that losses weigh more heavily than gains), can make individuals reluctant to spend money on an insurance product they hope never to use. Additionally, "optimism bias" (the belief that bad things are less likely to happen to oneself than to others) can lead people to underestimate their future care needs. Psychological factors such as procrastination and the need for immediate gratification also play a role. Taking out long-term care insurance is easy to postpone, since

[1] Brown and Finkelstein (2009)

the benefits are not immediate and are contingent on an unpleasant eventuality — becoming severely dependent.

Another reason why individuals save insufficiently for retirement and particularly for the loss of autonomy may be a lack of information and knowledge. Empirical studies, such as those by Boyer et al. (2019, 2020), document these effects. Finally, this phenomenon may stem from present bias and self-control problems. Individuals are seen as having two "selves," one concerned with immediate gratification and the other with long-term benefits and future well-being. When it comes to deciding how much to save, the first self prevails. Clearly, these behavioral biases could explain the low demand for long-term care insurance.

Many people underestimate the probability that they will need long-term care. This form of cognitive bias — whereby people believe they are less likely than others to experience negative events — is widespread. The reality, however, is quite different. Studies suggest that approximately 70% of people reaching the age of 65 can expect to use some form of long-term care during their lifetime. Denial or minimization of this fact can lead individuals to fail to prepare for these eventualities.

Another reason is unattractive reimbursement rules. Long-term care insurance policies can be complex, and many people find it difficult to choose a plan suited to their needs. Benefit payment formulas are unappealing. Two countries where the long-term care insurance market has been relatively developed until now are the United States and France. In the United States, full reimbursement of incurred expenses was the predominant formula until recently, but most companies now offer time-limited cash indemnity policies. In France, the common formula is that of a lifetime cash indemnity. Neither formula provides sufficient protection against the cost of severe and prolonged disability, which is far from improbable. Nordman (2016) indicates that 52% of individuals reaching age 65 will have high long-term care needs over their remaining lifetime. These needs are expected to last on average about 2 years, but will last longer for 26% of individuals. This is particularly relevant for women: 17.8% of them will have a period of severe dependency lasting 5 years or more.

To prevent certain dependent individuals from exhausting all their resources and being forced to rely on their children's help or on social assistance such as Medicaid, Drèze et al. (2016) argue in favor of the deductible principle. Under this principle, individuals should pay a portion of the dependency costs incurred during a certain number of months, and beyond a certain threshold, all costs would be covered. Drawing inspiration from Arrow(1963)'s celebrated deductible theorem, these authors show that such an insurance policy is efficient in the case of dependency[2].

It is clear that encouraging a greater number of people to take out long-term care insurance is desirable, but requires both greater awareness of the risks and potential costs of long-term care, as well as improved accessibility and understanding of insurance products. Educational

[2] See also Dilnot (2011)

campaigns, simplified product offerings, and potentially government incentives or mandates could help increase long-term care insurance uptake.

In conclusion, the prospects for growth in the private long-term care insurance market appear, in the near future, not as promising than would be desirable.

2.3. The Need of a Growing Role for the State

Governments recognize the growing need for long-term care and are consequently increasing their spending on dependency support. For example, the European Commission's Aging Report (2024) projects that public expenditure on long-term care in the EU will rise from 1.7% of GDP in 2022 to 2.6% by 2070, reflecting growing demand. This projection applies to the baseline scenario, equivalent to an increase in spending of 48%. The variation in projected spending as a percentage of GDP ranges from broadly stable in Greece to increases exceeding 100% in Spain and Denmark. There is also variation in the generosity of public programs from country to country. The Netherlands devotes 3.8% of its GDP to long-term care, while Spain devotes only 0.8%. We thus observe that despite serious budgetary difficulties, most European countries continue to devote an ever-growing share of resources to LTC.

It is hard not to draw an analogy between the question of retirement and that of old age disability. A century ago, the bulk of retirees' resources came from the family. Today, the State and the market have completely displaced any role for the family in this area. Will we not witness, in the coming decades, the same phenomenon of substitution in the care of dependent individuals? We already observe that the countries with the most comprehensive LTC programs are also those in which the family plays the weakest role. In a recent study (EC, 2021), an assessment of the importance of informal care in the EU is presented, measured as a percentage of GDP. The authors employ two approaches to estimate this value: the substitute service method, which assigns a monetary value to informal caregivers' time based on the price that professionals would charge for specific caregiving tasks, and the opportunity cost method, which values informal caregivers' time in terms of the potential earnings or alternative uses of time they forego. Comparing the value of informal long-term care provision as a percentage of GDP, calculated using these two methods and the value of formal long-term care expenditure as reported in the Aging Report leads to an interesting observation: Southern European countries appear to benefit from substantial levels of informal care) along with relatively low levels of public formal long-term care expenditure, whereas the opposite occurs in the Northern countries.

Most European nations maintain public programs specifically designed to support low-income individuals, funded through taxation or social insurance systems. In addition, States also provide direct financial assistance to individuals or subsidize services to improve financial accessibility. Equally crucial is the State's role in regulating LTC facilities to ensure quality care, safety, and the dignity of residents. This involves regular inspections and rigorous enforcement of standards to maintain high-quality care.

Furthermore, the State must implement training requirements for LTC staff to ensure they possess the necessary skills. This regulatory oversight is becoming increasingly important given the growing incidents of abuse in institutions such as nursing homes. However, public intervention in LTC is often characterized by its underdevelopment and lack of coordination. Fragmentation within the system presents significant challenges, impacting the overall effectiveness, quality, and accessibility of care. In many countries, responsibility for LTC is dispersed across various levels of government — federal, regional, and local — leading to inconsistencies in policies, funding mechanisms, and service delivery models. This results in varying standards of care and eligibility criteria, creating disparities across regions.

LTC funding can come from diverse sources, including public health insurance, social protection programs, private insurance, and out-of-pocket payments. The complexity of these funding streams can complicate the navigation process for both service providers and beneficiaries. There is a pronounced need for integrated care models. Some countries are moving toward a more coordinated approach that aims to align healthcare, social services, and LTC. These efforts also include the harmonization of policies across jurisdictions to establish a more uniform standard of care.

One example is France's Fifth Risk Plan, which seeks to address dependency in old age — a "fifth risk" recognized within a social protection system that already covers illness, old age, family, and employment. However, due to budgetary constraints, this initiative remains pending. By emphasizing greater coordination and integration, countries can aim for a more efficient and equitable LTC system. This approach not only simplifies management and improves the quality of care, but also ensures that the dignity and well-being of the elderly are protected in a sustainable manner.

Two things seem certain. On the one hand, the role of the State in long-term care will need to grow. On the other hand, the State must rely, as much as possible, on the two other pillars: the family and the market. Accordingly, in the next section, we present models that focus on specific aspects of the relationship between public policy, family solidarity, and private insurance. We will see thru a rather simple model that both the family and the market can impact the design of a LTC public insurance.

3. The design of a full fledge long term care social insurance.

When disabled parents depend on family members for care and support, unforeseen life events can abruptly disrupt these arrangements. The most consequential of such disruptions include the following. The death of a caregiver creates an immediate and often permanent void in support: when an adult child who provided daily assistance passes away, the disabled parent may lose both their primary caregiver and a vital source of emotional sustenance. Illness can similarly impair a caregiver's capacity to provide care. Migration — whether for employment, education, or personal reasons — can physically separate caregivers from those who rely on them. Economic hardship may reduce a caregiver's availability, while family disputes and the breakdown of relationships can sever caregiving arrangements altogether.

These disruptions have direct implications for the design of public policy. In this section, we analyse how the inherent uncertainty of informal care affects the optimal structure of public long-term care insurance.[3]

The model developed here considers parent–child families in which children's contributions to their elderly parents' care depend on their individual market productivity and their degree of altruism. For the time being, we assume that all elderly individuals are disabled and that there is no lifetime uncertainty; we revisit both assumptions at the end of this section. Families differ in their wage levels w_i. In this stylised setting, saving serves to finance LTC and can thus be interpreted as a private LTC insurance premium. Informal care a_i is provided by the child out of altruism, the intensity of which is parameterised by β. The utility of the disabled elderly person is represented by a quasi-concave function $H(a_i, m_i)$, where $m_i = s_i + g$ denotes formal care, with g being a flat-rate public LTC benefit. Individual lifetime utility is:

$$U_i = \beta H(\tilde{a}_i, \tilde{m}_i) + w_i(1-\tau)l_i - s_i - v(\tilde{a}_i + l_i) + H(a_i, s_i + g)$$

where τ is the payroll tax rate, l_i denotes labour supply, and $v(l_i + a_i)$ is the disutility of effort. We assume that first-period consumption $c_i = w_i(1-\tau)l_i - s_i - v(\tilde{a}_i + l_i)$ generates quasi-linear utility. In the second period, the individual is disabled and derives utility $H(a_i, m_i)$. We assume no time preference and a zero interest rate.

The variable $\tilde{a}_i$ refers to the care that individuals supply to their own disabled parent (the tilde denotes variables pertaining to the previous generation). The variable a_i refers to the care individuals expect to receive fron their children in the second period of their life when they are disabled. The disutility function $v(\cdot)$ is strictly convex.

In Perelman and Pestieau (2025) — see also Bolin et al. (2008) and Bonsang (2009) (The former study covers a broad panel of European countries; the latter draws on HRS data.) — a welfare function $H(a, m)$ is implicitly assumed, where a denotes informal care and m formal care. A key finding across these studies is that the degree of substitutability between the two forms of care diminishes as the severity of disability increases.

The timing of the game is as follows:

1. The government chooses the tax rate and the benefit level so as to maximise parental welfare.
2. Individuals choose their labour supply, their saving, and — for a fraction of them — the level of care $\tilde{a}_i$.

[3] Cremer, Gahvari and Pestieau (2017)

Our model abstracts from downward altruism and, by extension, from planned bequests. In the case of uncertain lifetimes, accidental bequests are ruled out by assuming the existence of a perfect annuity market. These simplifications are adopted in the interest of tractability.

3.1 The Individual's Problem

For a variety of reasons, an individual cannot be certain of receiving care from their child. We denote the uniform probability of receiving informal care by ζ: with probability $1-\zeta$, a disabled parent receives no informal care ($a=0$). Consequently, only a fraction ζ of individuals provide assistance to their parents.

The lifetime utility of an individual facing a probability ζ of receiving care from their child is:

$$U_i = w_i(1-\tau)l_i - s_i - v(l_i + \tilde{a}_i) + (1-\zeta)H(0, s_i + g) + \zeta H(a_i, s_i + g)$$

Recall that we distinguish between a_i and $\tilde{a}_i$, where the latter variable refers to the aid provided by the individual to his/her disabled parent, and the former to the aid that he/she expects to receive from his/her own child. The fraction ζ of individuals who provide care chooses the level of informal care that maximises:

$$U_i = \beta H(\tilde{a}_i, \tilde{m}_i) + w_i(1-\tau)l_i - s_i - v(a_i + l_i) + (1-\zeta)H(0, s_i + g) + \zeta H(a_i, s_i + g)$$

This yields the first-order condition:

$$-v'(l_i + \tilde{a}_i) + \beta H_1(\tilde{a}_i, \tilde{m}_i) = 0$$

To interpret this expression, recall the first-order condition for labour supply:

$$w_i(1-\tau) - v'(l_i + \tilde{a}_i) = 0$$

Substituting this standard expression into (1), we obtain:

$$-w(1-\tau) + \beta H_1(\tilde{a}_i, \tilde{m}_i) = 0$$

This condition yields a supply function for caring time: $a_i = a(m_i, w_i(1-\tau); \beta)$. Differentiating the above first-order condition gives:

$$\frac{\partial a_i}{\partial m_i} = \frac{H_{12}}{-H_{11}} \gtrless 0 \Leftrightarrow H_{12} \gtrless 0$$

In the separable case where $H_{12}=0$, informal elder care depends only on $w_i(1-\tau)$ and β. When the two types of care are complements, informal care increases with m_i; when they are substitutes, a crowding-out effect obtains.

The first-order condition with respect to s is:

$$-1 + \zeta\left[H_2(a_i, m_i) + H_1(a_i, m_i)\frac{\partial a_i}{\partial s_i}\right] + (1-\zeta)[H_2(0, m_i)] \leq 0$$

or equivalently:

$$-1 + \zeta H_1(a_i, m_i)\frac{\partial a_i}{\partial s_i} + \Xi H_2 \leq 0$$

where $\Xi H_2 = \zeta H_2(a, m) + (1 - \zeta)H_2(0, m)$. The inequality reflects the possibility that there is no private LTC insurance, either because high loading costs render it unaffordable or because the public benefit crowds it out.

So far, we have been dealing with children providing care. For the fraction $1 - \zeta$ of children not caring for their parent $\tilde{a}_i = 0$ and FOCs (4) and (7) hold.

3.2 Optimal Policy

We now turn to the social welfare maximisation problem when $s_i > 0$. This implies that $1 - \Xi H_2 = \zeta H_1(a_i, m_i)\frac{\partial a_i}{\partial s_i}$. We posit that the government is concerned solely with the welfare of the members of a given generation. Given the quasi-linearity of individual utility, we concavify lifetime utility using a strictly concave transformation $V(\cdot)$, so that transformed utility is:

$$V_i = V(U_i) = V[w_i(1 - \tau)l_i - s_i - v(\tilde{a}_i + l_i) + (1 - \zeta)H(0, s_i + g) + \zeta H(a_i, s_i + g)]$$

with $V' > 0$ and $V'' < 0$. We expect $V'(U_i)$ and w_i to be negatively correlated. The Lagrangian to be maximised is:

$$\mathcal{L} = E\{[V(w(1 - \tau)l - s - v(l + \tilde{a}) + (1 - \zeta)H(0, s + g) + \zeta H(a, s + g)\} + \mu[\tau w l - g]$$

where $Ez = \sum_i n_i z_i$ and μ is the multiplier associated with the revenue constraint. The expectation operator aggregates across individual types as well as across children caring and those not caring.

Note that the altruistic term $\beta H(\tilde{a}_i, \tilde{m}_i)$ is omitted from the welfare criterion. This term was already accounted for in the welfare-maximisation problem of the previous generation. The approach follows Harsanyi (1955) and Hammond (1987), who advocate excluding all external preferences, even benevolent ones, from the social utility function (Hammond, 1987, p. 87).

Given $a = a(m, (1 - \tau)w; \beta)$, the first-order conditions are:

$$\frac{\partial \mathcal{L}}{\partial g} = E\{[V'[(-1 + \Xi H_2)\,\partial s/\partial g + \Xi H_2 + \zeta H_1(a, m)\,da/dg]]_i - \mu\} = 0$$

Using the individual's first-order condition, this simplifies to:

$$\frac{\partial \mathcal{L}}{\partial g} = E\{[V'[\zeta H_1(a, m)\,\partial a/\partial g + \Xi H_2]]_i - \mu\} = 0$$

The first-order condition with respect to the tax rate is:

$$\frac{\partial \mathcal{L}}{\partial \tau} = -E\{[V' w l]_i - \mu(w l + \tau w\,\partial l/\partial \tau)_i\} - \zeta \Delta = 0$$

where $\Delta = E\,V'w(1-\tau)\frac{\partial \tilde{a}}{\partial \tau} > 0$ captures the negative indirect effect of taxation on labour earnings, which falls on the fraction ζ of individuals who provide care.

Combining these two conditions yields:

$$\frac{\partial \mathcal{L}^C}{\partial \tau} = -\text{cov}(V', wl) - \mu\tau w\frac{\partial l}{\partial \tau} - \zeta\Delta$$

The optimal tax formula is therefore:

$$\tau = \frac{-\text{cov}(V', wl) - \zeta\Delta}{-\mu E w\frac{\partial l}{\partial \tau}}$$

In the numerator, the covariance term is unambiguously negative, reflecting the redistributive dimension of the LTC scheme. The second term is also negative, indicating that the generosity of public benefits should decrease with the probability of family assistance. The denominator is standard: it captures the efficiency cost of taxation, which is small when labour supply is inelastic and large otherwise.

We now turn to the optimal policy when $s_i = 0$. It is given by the following FOC:

$$\frac{\partial \mathcal{L}^C}{\partial \tau} = -\text{cov}(V', wl) - E\,V'[1 - \Xi H_2 - \zeta H_1\frac{\partial a}{\partial m}]_i Ewl + \mu\tau Ew\frac{\partial l}{\partial \tau} - \zeta\Delta$$

which gives:

$$\tau = \frac{-\text{cov}(V', wl) + E\,V'\left[\Xi H_2 + \zeta H_1\frac{\partial a}{\partial m} - 1\right]Ewl - \zeta\Delta}{-\mu E w\frac{\partial l}{\partial \tau}}$$

In the numerator, the covariance term is negative; the second term is positive; and the last term is negative. The denominator is positive, since $\partial l/\,\partial \tau < 0$. It follows that the generosity of the public scheme increases as ζ falls — that is, as informal care becomes less reliable — and when the two types of care are complements, i.e. $\partial a/\,\partial m > 0$.

To summarize, we show that the probability of children defaulting on care increases the optimal size of public intervention. Furthermore, in the absence of private insurance, this effect is reinforced when informal and formal care are less and less substitutable.

This model is admittedly stylized. We assume that all individuals live for two periods and become disabled in the second. The only source of uncertainty is whether they will receive care from their children. In Nishimura and Pestieau (2026), the model is extended to incorporate both disability risk and longevity risk. Given the well-documented positive correlation between income and longevity, and the negative correlation between income and disability risk, the case for social long-term care insurance is further strengthened.

4. Long term care and pensions.

Governments are facing increasing pressure to expand the provision of publicly financed long-term care (LTC) insurance, as demographic ageing raises the prevalence of frailty and disability in old age and informal care arrangements come under growing strain. At the same time, the fiscal burden associated with financing public pension systems continues to grow, driven by rising longevity, declining fertility, and the resulting deterioration of dependency ratios. These two challenges are typically addressed separately, through distinct policy instruments, financing mechanisms, and administrative bodies. However, there are strong economic arguments for integrating the insurance of longevity and disability risks within a common public insurance framework, rather than treating pension provision and LTC coverage as unrelated policy domains. Such an integration is justified both from an efficiency and an equity perspective.

The efficiency argument: negative dependence between risks. At the individual level, longevity and disability risks exhibit a negative dependence. Individuals who experience severe disability generally have lower life expectancy, since chronic illness and functional decline are themselves predictors of mortality, whereas those who survive to advanced ages tend to remain in relatively good health for longer periods — a pattern consistent with the "compression of morbidity" observed among long-lived individuals. From an insurer's perspective, this negative correlation is valuable: a pension liability (the cost of paying benefits over a long lifespan) and an LTC liability (the cost of care, which is typically concentrated among those who become disabled, often at younger ages within the retired population) partially offset one another across the population. Pooling these risks within a single insurance scheme therefore generates diversification gains, in the same way that an insurer benefits from combining negatively correlated exposures in a portfolio. This improves risk sharing and can reduce the overall capital or reserve requirements needed to guarantee the scheme's solvency, potentially lowering the total cost of social insurance relative to running two actuarially separate systems. Separate systems, by contrast, cannot exploit this natural hedge: each must independently reserve against its own tail risk (extreme longevity on one side, extreme care costs on the other), even though in the underlying population these tail events rarely coincide.

The equity argument: socioeconomic gradients in health and mortality. The case for integration is even stronger when heterogeneity across socioeconomic groups is taken into account. A substantial body of empirical evidence documents a pronounced socioeconomic gradient in both longevity and healthy life expectancy: individuals in lower income or education brackets consistently die earlier and spend more of their remaining years with disability or functional limitation than those higher in the distribution. Individuals with low lifetime earnings not only have shorter life expectancy but also spend a larger fraction of their (shorter) lives in poor health, entering disability earlier and experiencing more severe or prolonged care needs. Conversely, individuals with higher lifetime earnings tend to live longer and remain disability-free until much later in life, often reaching advanced old age before requiring intensive care, if at all.

This has a direct and somewhat counterintuitive implication for redistribution. A pension system alone, especially one with actuarially fair or earnings-linked annuitization, tends to redistribute *regressively* from a lifetime perspective: because high-income individuals live longer on average, they collect pension benefits over more years, effectively transferring resources from short-lived, low-income contributors to long-lived, high-income ones. An LTC insurance system considered in isolation can partly offset this, since low-income individuals draw on care benefits earlier and more intensively. But when the two systems are administered separately — different eligibility rules, different financing streams, different political constituencies — there is no mechanism to ensure that the progressive redistribution embedded in LTC provision is calibrated against, or coordinated with, the regressive redistribution embedded in pension annuities. Consequently, the current separation between pension and LTC systems limits the scope for efficient and deliberate redistribution across individuals who differ simultaneously in lifetime income and health status.

A unified social insurance scheme covering both old-age pensions and long-term care would therefore exploit the natural correlation between longevity and disability risks while simultaneously allowing redistribution to reflect disparities in both lifetime income and health. In practical terms, this could take the form of integrated contribution schedules, joint actuarial reserving, or benefit formulas that explicitly condition pension annuitization on health/disability trajectories rather than treating longevity risk and care risk as independent underwriting problems. By jointly insuring these risks, the government can improve allocative efficiency through enhanced risk pooling — lowering the aggregate cost of guaranteeing both types of coverage — and achieve a more equitable allocation of public resources across socioeconomic groups, correcting the regressive bias embedded in pension systems considered in isolation.

It is worth noting that integration is not without its own design challenges: it requires reliable, low-manipulation indicators of disability status to avoid new sources of moral hazard or classification error, and it raises questions of political economy, since merging previously separate funding streams and beneficiary constituencies can generate distributional conflicts of its own. Nonetheless, the underlying actuarial and distributional logic — negative dependence between risks at the individual level, and positive dependence between low income and poor health at the population level — provides a coherent economic rationale for treating pension and LTC insurance as two faces of a single social insurance problem rather than as separate policy silos

5. Conclusion

In this article, we began by highlighting a worrying trend in informal caregiving, alongside the persistent failures of the long-term care insurance market — even as demand for long-term care services is set to grow substantially in the decades ahead. Changing family structures, rising female labor-force participation, geographic dispersion of adult children,

and the sheer physical and psychological toll of caregiving all point toward a shrinking pool of family members willing or able to provide informal care in the future. At the same time, the private long-term care insurance market has failed to fill this gap: adverse selection, uncertain and rising costs, and consumers' well-documented difficulty in anticipating their own future care needs have kept take-up rates low and left insurers wary of offering products at affordable prices. This is the classic setting for market failure — one where the state has traditionally been called upon to intervene.

In light of these challenges, we argued for a more meaningful and coherent role for public authorities, while remaining mindful of the fiscal constraints they face. Any expansion of public involvement must be weighed against already-strained public budgets, aging populations that place simultaneous pressure on pension and health systems, and the political economy difficulties of introducing new mandatory levies or reallocating existing ones. Our argument was not for unconditional public takeover of long-term care financing, but for a more deliberate design of the public-private-family mix — one that acknowledges the real limits of what families and markets can be expected to deliver going forward.

We then developed a simple social insurance model that accounts for the respective roles of the family and the market. The model formalizes the trade-offs at stake: it treats informal care as an imperfect substitute for formal care, subject to its own opportunity costs and constraints, and it treats private insurance as constrained by adverse selection and behavioral frictions that keep coverage incomplete even when actuarially fair products exist in principle. By embedding both channels alongside a public insurance option, the model allows us to trace how the equilibrium allocation of care responsibility shifts as the underlying parameters — the availability of informal caregivers, the depth of private insurance markets — deteriorate.

Our analysis suggests that the decline of informal care, combined with the retreat of private insurance markets, points toward an expanding role for the state in both the financing and provision of long-term care. This conclusion carries several implications worth drawing out. First, it suggests that public intervention should not be conceived merely as a residual safety net for those who fall through the cracks of family and market provision, but as a structural component of long-term care systems going forward. Second, it implies that the design question is no longer whether the state should be involved, but how — through social insurance contributions, general taxation, means-tested support, or some hybrid arrangement — and how such financing can be made sustainable given the fiscal pressures already noted.

Finally, our results underline the urgency of anticipating this shift now, before demographic pressures intensify further: the further informal care erodes and private markets continue to underperform, the more costly and disruptive a delayed public response is likely to be. Future work should extend the model to explore the distributional consequences of different financing mechanisms, and to test the robustness of these conclusions to cross-country variation in family structures and existing welfare state configurations.

6. References

Arrow, K. (1963). Uncertainty and the welfare economics of medical care. American Economic Review, 53, 941-973.

Bolin, K., B. Lindgren, and P. Lundborg (2008). Informal and formal care among single-living elderly in Europe. Health Economics, 17(3), 393-409.

Bonsang, E. (2009). Does informal care from children to their elderly parents substitute for formal care in Europe? Journal of Health Economics, 28, 143-154.

Boyer, M., Ph. De Donder, C. Fluet, M.-L. Leroux and P.-C. Michaud (2019). Long-term care risk misperceptions. The Geneva Papers on Risk and Insurance - Issues and Practice, 44, 183-215.

Boyer, M., Ph. De Donder, C. Fluet, M.-L. Leroux and P.-C. Michaud (2020). Long-Term Care Insurance: Information Frictions and Selection. American Economic Journal: Economic Policy, 12(3), 134-169.

Brown, J. and A. Finkelstein (2009). The private market for long-term care insurance in the U.S.: A review of the evidence. Journal of Risk and Insurance, 76(1), 5-29.

Connolly, M., M-L. Leroux and A. Konou (2025) Evaluating the relationship between income, survival and loss of autonomy among older Canadians, The Journal of Economics of Ageing, 31, 100564

Cremer, H., F. Gahvari and P. Pestieau (2017). Uncertain altruism and the provision of long term care. Journal of Public Economics, 151, 12-24.

Dilnot A. (2011). Fairer Care Funding: The Report of the Commission on Funding of Care and Support. Commission on Funding of Care and Support, London.

Drèze J., P. Pestieau and E. Schokkaert (2016). Arrow's theorem of the deductible and long-term care insurance. Economics Letters, 148, 103-105.

EC (2021), Study on exploring the incidence and costs of informal long-term care in the EU, Brussels.https://op.europa.eu/en/publication-detail/-/publication/bafbb918-2197-11ec-bd8e-01aa75ed71a1/language-en

EC (2024). The 2024 Ageing Report. Economic and Budgetary Publications Office of the European Union, Luxembourg.

Hammond, P., (1987) Altruism, in The New Palgrave: A Dictionary of Economics. London: Macmillan.

Harsanyi, J., (1995) A theory of social values and a rule utilitarian theory of morality, Social Choice and Welfare 12, 319–344.

Janus, A. L. and P. Doty, (2018). Trends in Informal Care for Disabled Older Americans, 1982-2012. The Gerontologist, 58(5), 863-871. https://doi.org/10.1093/geront/gnx076

Lefèbvre, M., S. Perelman, and J. Schoenmaeckers, (2018), Inégalités face à la mort et au risque de dépendance, Revue française d'économie, 33(2), 75–11

Lefèbvre, M., J. Schoenmaeckers and L. Heymans, (2026) Impact of socio-economic status on loss of autonomy in the old age, unpublished

Nishimura, Y. and P. Pestieau (2026), Public pensions and LTC insurance with family solidarity, International Tax and Public Finance, forthcoming.

Nordman, E. (2016). The state of long-term care insurance: the market, challenges and future innovations. NAIC and Center for Insurance Policy and Research.

Pauly, M.V. (1990). The rational non-purchase of long term care insurance. Journal of Political Economy, 98, 153-168.

Perelman P. and P. Pestieau (2025), Informal and formal care for disabled elderly individuals. Substitutes or complements? CORE DP.

Perelman and Pestieau (2026), L'évolution de l'aide informelle aux parents dépendants :Vers un déclin annoncé ? Revue Française d'Économie, forthcoming

Pestieau, P. (2026), The Economics of Long-Term Care, Springer.

Trainar, Ph. (2024) Le marché de l'assurance dépendance, Revue d'économie financière, , vol. 0(4), 151-165.

Wolff, J. L., Cornman, J. C., and V.A. Freedman, (2025). The Number of Family Caregivers Helping Older US Adults Increased from 18 Million to 24 Million, 2011–22. Health Affairs, 44(2), 189-195. https://doi.org/10.1377/hlthaff.2024.00978