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Risk Markets and Value Creation Chair

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**Subsidizing
care of the
elderly**

**How deadly
are Europe's
nursing homes?**

Economics for the Common Good

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Editorial



Dear readers,

Our societies are getting older. By 2050, the WHO expects the number of people in the world over 60 years old to double, and the over-80 population to triple. And it's not just rich countries that face a huge demographic challenge: all countries are seeing growth in both the size and proportion of their elderly populations. Meanwhile, the costs of care for the elderly are getting higher. How will we pay the bills?

Unravelling this Gordian knot is a central focus of the long-standing partnership between TSE researchers and SCOR Corporate Foundation for Science. After creating the "Risk Markets and Value Creation" Chair in 2008, SCOR renewed its generous support for TSE research in 2020, helping to expand the frontiers of our understanding of risk and its impact on economic decisions.

The Chair's annual workshop is a chance to showcase the value of this teamwork, to discuss the latest research, and for TSE researchers to exchange ideas with SCOR representatives working at the frontline of insurance and risk management decisions. The surge of the Omicron

variant thwarted our plans to hold an in-person event on Long-Term Care and Aging in January, but we were delighted at the online turnout and engagement with our virtual presentations and discussions.

In this issue, we feature interviews with two of the speakers: **Tatyana Koreshkova** (*Concordia University*) on "**Long-term care choice in equilibrium: Implications for Public Policies**" and **Mathieu Lefebvre** (*Aix-Marseille School of Economics*) on "**Nursing homes and mortality in Europe: Uncertain causality**". Tatyana's analysis of supply and demand decisions in the US long-term care market suggests that subsidizing in-home care for the poor may be a much more effective policy than increasing Medicaid payments. For many elderly Europeans, even before the Covid-19 pandemic, Mathieu finds that nursing homes were deadlier places than their own homes. He suggests that the design, organization and financing of nursing homes may be to blame.

I hope you will enjoy discovering the invaluable contributions of the scientific community to this field. I offer my thanks to the researchers and the SCOR Foundation for Science for their commitment to solving the urgent problems that face our aging populations.

Wishing you a rewarding read!

Stéphane Villeneuve, *Scientific Director, SCOR-TSE partnership*

Research highlights

SCOR-TSE Workshop on Long-Term Care and Aging

How should governments, insurers and care providers respond to the challenge of supporting an increasingly elderly population? Since 2008, the SCOR Chair "Risk Markets and Value Creation" has supported theoretical and applied research at TSE on the regulation of insurance markets and risk management, combining methods from financial economics, industrial organization and econometrics.

On January 28, the SCOR-TSE Workshop on Long-Term Care and Aging showcased some of the latest economic research in this field. As the keynote speaker, **Pierre Pestieau** (*University of Liège*) delivered an overview of "The economics of long-term care". Besides **Mathieu Lefebvre** and **Tatiana Koreshkova**, to whom we return below, **Holger Strulik** (*University of Goettingen*) examined "Optimal demand for medical and long-term care". **Chiara Canta** (*Toulouse Business School*) discussed "Family bargaining and the gender gap in informal care" and **Jean-Marie Lozachmeur** (*TSE*) presented his work on "Gender wage and longevity gaps and the design of retirement systems".

Introducing the online event, SCOR Foundation Director, **Philippe Trainar** welcomed the contribution of Toulouse economists and called for more government action.

“ At SCOR, we have been very satisfied by the activity of the Chair and all the ideas we have been able to share, thanks to the academics. Long-term care (LTC) and aging is a very hot topic in advanced economies. It's even more challenging as we don't know so much about it. Many political proposals seem to ignore the basics of behavioral theory and empirics of aging. At the same time, insurers lament the lack of demand for LTC products and governments' failure to provide them.

Philippe Trainar, SCOR Foundation Director



Subsidizing care of the elderly



Tatyana Koreshkova

is a professor at Concordia University, a member of Centre Interuniversitaire de recherche en économie quantitative (CIREQ), a researcher at Centre interuniversitaire de recherche en analyse des organisations (CIRANO) and a fellow at the Retirement and Savings Institute – HEC Montreal.

She works on topics including economic growth and development, inequality, education, health, aging and long-term care.

Governments around the world are beset by rising demand and costs for long-term care of the elderly. New research by Tatyana Koreshkova (Concordia University) and Minjoon Lee (Carleton University) suggests that an effective response will require a better understanding of the decisions made by families as consumers of care, and by nursing homes as long-term care providers. Speaking at the SCOR-TSE Workshop in January, Tatyana discussed her preliminary results and their policy implications.

Given that Medicaid plays a big role for both supply and demand in the US long-term care market, it's important to know how government policies affect supply and demand decisions. We want to model decision-makers on both sides of the market so that demand and supply are allowed to respond to policies

What motivated this study?

Our work is motivated by the high demand for long-term care. About 70% of retired individuals will need long-term care over their lifetime. Half of them will use paid care. But this care is expensive, whether you use a nursing home (a semi-private room costs \$250/day) or in-home care (\$20-40/hour plus high fixed costs), so many people rely on public programs. In the US, the largest public program is Medicaid, which uses means testing to target the poor and covers long-term stays in nursing homes and in-home care.

Nursing homes are a big industry in the US – \$130 billion – and it is mostly privately run. More than half (57%) of the industry's long-term care revenue comes from Medicaid, which reimburses nursing homes at a rate below the private price; a small portion comes from private insurance payments; and the rest is paid out of pocket. Competition is limited because most individuals do not travel far to find a nursing home.

How do you seek to contribute to existing research in this area?

Given that Medicaid plays a big role for both supply and demand in this market, it's important to know how government policies affect supply and demand decisions. We want to model decision-makers on both sides of the market so that demand and supply are allowed to respond to government policies.

The existing long-term care literature has focused on either the demand side (household decisions and how households respond to public policy) or the supply side (the optimal

decisions of nursing homes regarding prices, quality of care, and number of beds). Consequently, the demand-side studies take the cost and quality of nursing home care as given, while the supply-side work takes demand for long-term care as given.

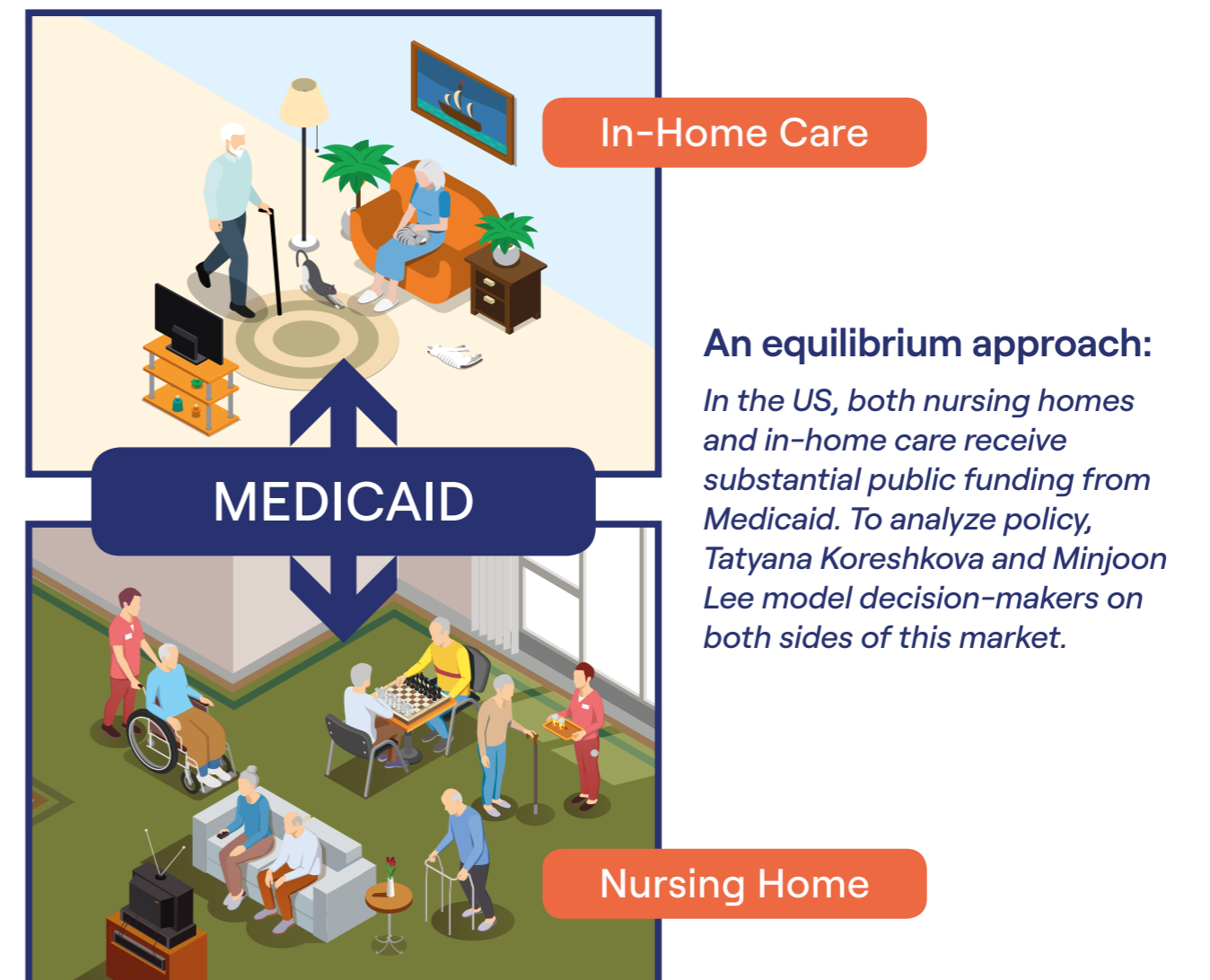
We bridge the two literatures. We model household life-cycle behavior with old-age risks in which individuals make choices between in-home care and a nursing home. This allows us to obtain a micro-founded demand for nursing-home care. The nursing homes then observe this demand, and decide the price, intensity of care, and number of beds. These nursing-home decisions then determine the cost and quality of nursing-home care, which in turn affects household decisions.

We discipline our model with rich micro and macro evidence on long-term care, matching patterns of long-term care usage by health, wealth, and family status (using data from the Health and Retirement Study (HRS), 2004-2014). We then study the effects of different long-term care policies.

How do you study both sides of the long-term care market?

Our model is large and dynamic. On the demand side, households differ with regards to age, wealth, income, health, and family status. They solve life-cycle dynamic optimization problems in the face of uncertainty about their long-term care needs and family status, which may change because of spouse survival and child availability for care. Households value consumption of goods, care in bad health states, and bequests. When they are in poor health, individuals can opt for in-home care, choosing its intensity and paying a marginal cost. This cost is lower if there is a healthy spouse or child nearby. Or, they can choose nursing home care, accepting the quality and price as set by the institution. Medicaid covers the full cost of care for those who are eligible. On the supply side, nursing homes in a local market decide the price of care and care intensity to maximize their profits.

We evaluate the effects of two policy experiments: a more generous Medicaid policy and a subsidy to in-home care. We compare these effects with and without nursing-home response. We measure the benefit of each policy to households (consumer surplus) as a lump-sum wealth compensation at age 70.



What is the impact of a more generous Medicaid policy?

Medicaid finances nursing-home and in-home care of the poor, with eligibility determined by income and asset tests. In one of our policy experiments, Medicaid consumption floors are raised by \$3,000 per year for all types of individuals. The direct effect of the policy leads those who qualify to use more Medicaid-financed care, both in home and at nursing homes. Not surprisingly, this direct effect mostly affects poor individuals.

There is also an indirect effect operating through the reaction of nursing homes. We find that they increase the quality and price of care in response to higher demand from Medicaid residents. The increased quality attracts more Medicaid residents, but the increased price drives some private nursing-home residents into private in-home care.

This reallocation of care is important. If we look at the welfare effects, consumer surplus increases much more when nursing homes are allowed to respond. However, overall Medicaid expenditures increase even more, driven by the large increase in reimbursement claims by nursing homes. So, overall, we show that this is an inefficient policy, and that the supply-side reaction is an important source of this inefficiency.

Is an in-home care subsidy more effective?

For those without family – a healthy spouse or child – to rely upon, in-home care is quite costly since they need to purchase housekeeping and other similar services. Achou (2021) estimated the fixed cost of in-home care to be \$20,000 per year. This cost may create a big barrier to in-home care for those without family help. We consider a subsidy in the form of a direct cash transfer or a fixed number of hours of basic custodial care. Instead of means testing, there is uniform eligibility for individuals without family support.

This subsidy makes in-home care more attractive: some individuals leave Medicaid and private nursing homes for private in-home care. On the supply side, nursing homes face greater competition from the cheaper private in-home care option. Their response is to reduce the price and quality of care. The reduction in price allows them to bring some customers back, but the reduction in quality makes a lot more individuals leave Medicaid nursing-home care.

These effects are substantial and drive the final result. Consumers obviously benefit from the subsidy. But, interestingly, even accounting for the cost of all the transfers to individuals, overall Medicaid expenditure does not increase—if anything, it decreases—as its reimbursement to nursing homes for Medicaid beds falls dramatically.

The key takeaway is that the in-home care subsidy is an effective policy. Uniform eligibility reduces distortions and it's easy to implement. The subsidy pays for itself: no extra taxes are necessary. Care is also allocated more efficiently because, on the margin, consumers pay the "true" price of care.

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SUMMING UP

- Tatyana and Minjoon build an equilibrium model of long-term care choice with decision-makers on both the supply and demand sides of the market.
- Their model matches the empirical long-term care usage moments, including the distribution of hours of care and patterns of nursing home usage by health, family status, income and wealth. The model also matches the fraction of Medicaid patients for in-home and nursing-home care.
- They show that in-home care subsidies achieve more efficient distribution of care at no additional cost to the government.
- The key to this result is allowing individuals to face the marginal price of care.
- The supply-side response is important even when analyzing long-term care policies targeting the demand side.



How deadly are Europe's nursing homes?



Mathieu Lefebvre is a professor at Aix-Marseille School of Economics and affiliated to the Center of Research in Public Economics and Population Economics (CREPP) and the Global Labor Organization (GLO).

His research focuses on social preferences, the impact of social policies on individual behavior, and demography, especially the effect of aging on welfare.

Europe's elderly have been hit hard by the pandemic, with nursing homes suffering a heavy toll from Covid-19. But new research by Mathieu Lefebvre (Aix-Marseille School of Economics) and his University of Liège coauthors finds that nursing homes were deadly places even before the current health crisis. Speaking at the SCOR-TSE workshop in January, he suggested that higher mortality in nursing homes in some European countries (compared to individuals in private homes) may be attributed to the way they are designed, organized and financed.

What inspired you to investigate mortality in nursing homes?

The Covid-19 crisis has raised the question of the high mortality of elderly living in nursing homes. During the first wave of the pandemic, about 66% of total Covid-related deaths in Spain, 50% in France and 35% in Germany were nursing-home residents. In the public debate, it has been argued that due to the low quality of care and the physical proximity of nursing-home residents, life expectancy was lower than in private homes. The disparities in mortality rates among European countries also raise questions about differences in the quality and the institutional features of nursing homes in Europe. The recent Orpea scandal has also cast doubt about care in nursing homes.

If the structure and organization of nursing homes is leading to higher mortality, there is clearly a need for reform. This is also important regarding policies that determine how long-term care (LTC) is organized (by private, public or non-profit organizations), delivered (at home or in an institution), and financed (out of pocket, in kind, etc).

Previous studies have tried to identify factors of mortality in nursing homes. They demonstrate the role of co-morbidity and limitations, but also the quality of the nursing homes. Unfortunately, these studies do not provide causal evidence on the link between being in a nursing home and higher mortality.

How does your paper attempt to address this lack of evidence?

Using data from four waves of the Survey of Health, Ageing and Retirement in Europe (SHARE) that predate the current pandemic, we estimate if being in a nursing home leads to higher mortality. We focus on a sample of individuals aged 65+ with at least one limitation in an activity of daily living (ADL). Overall, our study is based on 13,340 observations for 13 countries. We look at mortality between two waves, observing whether a resident in one wave is still alive in the next wave, and we use propensity score matching (PSM) to compare treated (living in a nursing home) and untreated individuals (living at home).

We observe a higher mortality rate among those in nursing homes compared to those at home. The ratio between the two mortality rates is bigger than one for most countries except for Italy. But the overall negative impact of being in a nursing home on life expectancy is driven by differences among countries

What are your key results? And how do you ensure their robustness?

Overall, we observe a higher mortality rate among those in nursing homes compared to those at home. The ratio between the two mortality rates is bigger than one for most countries except for Italy. But the overall negative impact of being in a nursing home on life expectancy is driven by differences among countries in our sample. Germany, France, Belgium, Luxembourg, and Switzerland and other central and eastern European countries display a significant difference, but this is not the case for southern and northern countries.

Looking at these first results, you could say, "It seems that people in nursing homes die earlier than those who are still at home." But people in nursing homes may differ from people staying at home in terms of health, age, marital status, wealth, etc. For example, we observe that those who are in nursing homes are on average older, mostly single, and more likely to come from the first tercile of wealth, compared to those who live at home.

This is why we introduce our PSM method in order to control for the possible simultaneous determination of health and housing. Every individual in a nursing home is matched to individuals living at home with similar observable characteristics. This allows us to gather sufficient observable information to obtain a counterfactual. The differences in outcomes of these matched pairs can then be attributed to being in a nursing home, everything else equal. This produces very significant results. For the overall sample, being in a nursing home increased the probability of dying by 10 percentage points.

Which mechanisms might explain the cross-country differences in mortality?

You could say that there are differences in terms of health, but we control for this in our analysis. So the assumption we make is that the difference in mortality can be attributed either to the design and organization of nursing homes or to the quality of in-home care and services. We do not have micro data on care in nursing homes but we find interesting evidence when we relate our results to macroeconomic figures about formal and informal LTC at the national level. We do this being careful about issues of reverse causation and thus without concluding on any causal effects.

Instead, we just try to identify some mechanisms that should be investigated in the future to relate LTC policies to the results in our analysis. We observe some interesting things. First, in the countries in which we observe a significant effect of being a nursing home on mortality, there is a mix of lower public spending in terms of percentage of GDP in long-term care, a low number of long-term workers per 100 individuals aged 65+, and a high share of for-profit nursing homes. That means that in continental and eastern countries, the share of private nursing-home care is quite high, compared to the Nordic countries for example. The Nordic countries also have quite high spending in terms of percentage of GDP for nursing homes.

Looking at informal care, we observe that the southern countries have a really high share of informal carers who provide at least 20 hours of support per week to the elderly. The northern countries have a very high share of the population providing informal care, even if they do not provide that many hours compared to the southern countries. These results, which are totally descriptive, give us an insight into what we should investigate in order to better understand our results.

In countries in which we observe a significant effect of being a nursing home on mortality, there is a mix of lower public spending in terms of percentage of GDP in long-term care, a low number of long-term workers per 100 individuals aged 65+, and a high share of for-profit nursing homes

SUMMING UP

- Using cutting-edge PSM methods, Mathieu and his coauthors show that residing in nursing homes increases the probability of dying earlier, compared to staying at home.
- This overall higher mortality is driven by differences among countries, with central and eastern countries appearing to have "deadlier" nursing homes.
- These results can be related to country-specific features of the long-term care: Mathieu observes higher mortality in countries with lower public spending and fewer LTC resources.
- Mathieu calls for the role of the for-profit sector to be investigated, especially in light of the recent scandal regarding Orpea nursing homes in France.

Scientific contributions

Articles in peer-reviewed journals

Linqun Liu and **Nicolas Treich**, "Optimality of Winner-Take-All Contests: The Role of Attitudes toward Risk", *Journal of Risk and Uncertainty*, October 2021

Andrea Attar, **Thomas Mariotti** and **François Salanié**, "Entry-Proofness and Discriminatory Pricing under Adverse Selection", *American Economic Review*, vol. 111, n° 8, August 2021, p. 2623–2659

Working papers

Nicolas Treich, "The Dasgupta Review and the problem of anthropocentrism", TSE Working Paper, February 2022

Jean-Paul Décamps and **Stéphane Villeneuve**, "Learning about profitability and dynamic cash management", TSE Working Paper, n° 22-1301, February 2022

Francesca Barigozzi and **Helmuth Cremer**, "Shining with the stars: competition, screening, and concern for coworkers' quality", TSE Working Paper, n° 21-1257, November 2021

Catarina Goulão and **Agustín Pérez-Barahona**, "Health capital norms and intergenerational transmission of non-communicable chronic diseases", TSE Working Paper, n° 21-1236, July 2021

Helmuth Cremer and **Jean-Marie Lozachmeur**, "Coinsurance vs. copayments: reimbursement rules for a monopolistic medical product with competitive health insurers", TSE Working Paper, n° 21-1223, May 2021





Stay tuned

We'll keep you posted on the latest research and activities via TSE Reflect, our monthly thematic newsletter, aimed at bringing insight to economic practitioners.

Once a month we will deliver analysis from our academic community on important current topics in the fields of competition, digital economics, energy & climate, health, infrastructure & networks, and sustainable finance.

We are pleased to bring you insights on our advances in the economics of sustainable finance in the 2022 April edition of TSE Reflect.

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 **Reflect**

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Toulouse School of Economics

1, Esplanade de l'Université
31080 Toulouse Cedex 06
Tel: +33 (0)5 67 73 27 68

www.tse-fr.eu
partnership@tse-fr.eu


FOUNDATION FOR SCIENCE

www.scor.com/fr
5, Avenue Kléber, 75795 Paris Cedex 16
Phone : +33 (0) 1 58 44 70 00

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