Toulouse School of Economics

SCOR FOUNDATION FOR SCIENCE

TSE - SCOR Foundation for Science Journal

Risk Markets and Value Creation Chair

June 2024

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TSE-SCOR
A bridge over uncertain waters

Managing risk and uncertainty is crucial to good decision-making, whether by individuals, firms or policymakers. Supporting cutting-edge research in this area since 2008, TSE's collaboration with one of the world's largest reinsurers was recently renewed for another three years. The partnership's Scientific Director Stéphane Villeneuve shares a few thoughts on the success of SCOR's engagement with the scientific community in Toulouse and on current and future projects developed with the support of the SCOR Foundation for Science.

How does the TSE-SCOR partnership improve our understanding of risk and uncertainty?

TSE economists involved in the activities of the SCOR "Risk Markets and Value Creation" Chair have developed new research aimed at better understanding how risk transforms and influences economic decisions. The Chair's team of 15 researchers focuses on producing both theoretical and applied research on risk sharing, combining methodologies from financial economics, industrial organization, and econometrics. Their hard work is now reflected in a substantial list of academic publications on topics of great interest to the insurance sector. We are currently focused on addressing longevity risk, long-term care and social insurance, as well as risk attitudes and risk mechanisms.

Where does the partnership between the SCOR Foundation and TSE currently stand?

The SCOR 'Risk Markets and Value Creation' Chair has been renewed four times since its launch 16 years ago. We are deeply grateful for this longstanding support, as developing high-quality research on complex and multifaceted topics requires time! I'd like to express my gratitude to the researchers who have actively participated and contributed to the activities of the Chair, as well as to the teams at the SCOR Foundation for Science and at SCOR both in France and Ireland, who have generously dedicated their time to provide feedback on our research. Now, the SCOR Foundation for Science has renewed its support to TSE for a new research program covering the period from 2023 to 2026. I am very enthusiastic about what lies ahead of us and about sharing our future research results more widely.

How does SCOR's support for events like the Public Economics and Aging Conference further scientific inquiry?

Building on a multidisciplinary approach, this conference was held in Toulouse on May 23-24. Sponsored by the SCOR ''Risk Markets and Value Creation'' Chair, it addressed a wide range of topics. Speakers shared their latest research advances on subjects including how policymakers can improve nursing homes, tackle climate change, and design an equitable tax system. One of the highlights was a presentation by **Gregory Ponthière** and **Emmanuel Thibault** on their paper, 'Life expectancy, income, and long-term care' (see page 7 for a full discussion). Experience shows that events like this allow researchers to refine their work by interacting with peers, and being exposed to the most recent advances. The TSE Sustainable Finance Conference (December 2023), featuring **Marie-Laure Fandeur** (SCOR), illustrated that in-person events are also an effective means to engage with practitioners from both the public and private sectors.

Research highlights

Shining with the stars

Helmuth Cremer

is Professor of Economics at TSE.
His research interests include the optimal design of redistributive policies (including taxes, social insurance, pensions and education), as well as pricing, competition and public service issues in network industries, particularly the postal sector.

From soccer stars to legal eagles, professionals whose skills are in high demand often have their pick of the best employers. As well as considering salaries and other benefits, their choice is likely to be influenced by the quality of the team they will be joining. In a new paper supported by the TSE-SCOR 'Risk Markets and Value Creation' Chair, Francesca Barigozzi (University of Bologna) and Helmuth Cremer (TSE) study how a preference for talented colleagues may affect competition in the labor market.

Why might workers benefit from high-quality colleagues?

Working with top professionals may improve access to resources, opportunities, and general perks inside and outside the organization. If high-ability workers improve profits which are at least partially shared with all employees, other workers can benefit financially. Top professionals may also bring social status and reputation to the organization and their colleagues, as well as increasing workers' career prospects outside the firm. Future employers are likely to have a favorable view of job candidates previously employed by firms with high-quality workers. There may also be benefits from complementarities and spillovers in productivity.

> **Our innovation lies in the assumption that workers' choices are also influenced by their concern for coworkers' ability. We propose that an organization becomes more attractive as it hires more 'star' employees**

How does your paper study the impact of these peer effects?

Economists have traditionally focused on job decisions based on applicants' preferences for the organization, and the associated monetary compensation. Our innovation lies in the assumption that workers' choices are also influenced by their concern for coworkers' ability (CfCA). We propose that an organization becomes more attractive as it hires more "star" employees.

In our model, we consider two firms that differ in their marginal productivity and use nonlinear contracts to compete for workers with varying ability levels and preferences. High-ability workers prefer the firm that attracts the best workers.

We analyze the impact of these peer effects on competition to attract the best talents. How does CfCA shape nonlinear contracts and workers' sorting between competing firms? How does workers' private information on ability affect workers' sorting?

What are your main findings?

We find that CfCA matters. We first study a scenario in which workers' ability is observable, but their preference for firms is not. Imagine a job market for "senior" candidates whose previous performance – for example, a lawyer's successful cases or a researcher's publications – can be observed by firms.

In this context, the more productive firm hires a larger share of high-ability workers and, to a lesser extent, a larger share of low-ability workers. As a result, this firm always hires a more capable workforce. Here, CfCA increases total surplus and the benefits for top workers but reduces both firms' profits. Intuitively, CfCA increases competition for skilled workers by reducing mismatch disutility – that is, the cost to candidates of choosing an unsuitable job – and is thus detrimental to firms. If CfCA is sufficiently large, the more productive firm hires all high-ability workers.

> **If top workers improve their colleagues' productivity, this is likely to further increase the attractiveness of firms with a star-filled workforce. The presence of talented colleagues may also reduce a worker's chances for promotion**

Assuming firms are not identical, workers' sorting is always inefficient. Three distortions arise, each resulting in the least efficient firm employing too many workers. The first is caused by profit maximization: firms disregard mismatch disutility of all the workers except the marginal ones. The second depends on strategic interaction: the least efficient firm competes too aggressively while the most efficient one accommodates too much. The third is generated by the failure to fully internalize the externalities caused by CfCA and strategic interaction.

We then consider screening contracts and workers' sorting when firms cannot observe workers' ability or preferences. This scenario corresponds to a "junior" job market in which applicants have not yet been able to prove their talent in practice. Here, we show that the market allocation is only incentive compatible when firms have similar productivities and compete for heterogenous workers with low CfCA. Otherwise, three possible regimes emerge in which skilled workers always face overincentivization, mostly from the less efficient firm. Private information on ability then erodes at least part of the surplus obtained by top workers, especially when CfCA is high. Sorting is less distorted when CfCA is low.

What might be next for research in this area?

Our paper represents an important first step in the study of peer effects in the workplace. Our model could be extended by considering performance and productivity spillovers. For instance, if top workers improve their colleagues' productivity, this is likely to further increase the attractiveness of firms with a star-filled workforce. The reverse effect is possible if top workers reduce their coworkers' productivity. Career concerns could also be taken into account, given that the presence of talented colleagues may reduce a worker's chances for promotion.

SUMMING UP

- Concern for coworkers' ability (CfCA) tends to increase surplus and intensify competition to attract top workers. This benefits high-ability workers but is detrimental to firms.
- When ability is not observable and CfCA is low, screening contracts reduce sorting distortions. Overincentivization then erodes the benefits of CfCA for top workers, especially when CfCA is high.
- This suggests employers struggle to offer the right incentives, especially to early-career stars who benefit less from CfCA than senior talents with a well-established track record.

FURTHER READING

"Shining with the stars: Competition, screening, and concern for coworkers' quality" and other publications by Francesca and Helmuth are available to view on the TSE website.

Life expectancy, income and long-term care

Emmanuel Thibault

is a Professor at University of Perpignan and TSE researcher. His research interests in public economics and macroeconomics include population economics, economics of the family, growth and fiscal policies. In 2000, his PhD on "Microeconomic analysis and macroeconomic effects of intergenerational transfers" received the award of "Best Thesis of the Year" from Aix-Marseille University.

The future of our pension and insurance systems depends on precise understanding of the economics of longevity, managing growth in demand for long-term care. Informing policymakers and insurers about these complex dynamics has been a central focus of the SCOR 'Risk Markets and Value Creation' Chair since it was launched in 2008. In a recent study, Grégory Ponthière (UCLouvain) and Emmanuel Thibault (TSE) shed new light on the link between economic prosperity and life expectancy in aging societies.

What is the Preston Curve? And why does it matter?

In a seminal paper in 1975, Samuel Preston identified the existence of an increasing (and concave) relation between income per capita and life expectancy at birth. This link has since been observed using more recent cross-sectional data (see **Figure 1**).

The identification of this Preston Curve gave birth to long-run health macroeconomics, with theoretical models exploring the links between life expectancy and the economy through various channels such as rising labor productivity associated with better health, time-horizon effects fostering physical or human capital accumulation, and the interaction between longevity and increases in health spending, savings and education.

For governments and other decision-makers, Preston's discovery underlines the importance of economic growth for improving health outcomes, including overall well-being and quality of life. It suggests that health and economic policies have (partly) overlapping effects, and that a multidisciplinary approach will be crucial to addressing health inequalities and development challenges.

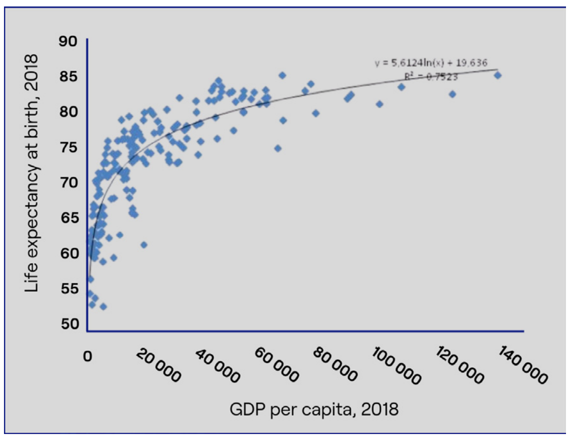


Figure 1. *The Preston Curve for 185 countries in 2018*

Why do we need to rethink the Preston Curve?

Most existing theoretical models dealing with the Preston Curve fail to account for the possibility of losses of autonomy in old age, an increasingly widespread problem for many societies. The various effects of long-term care (LTC) costs on economic and demographic dynamics need to be examined to understand the dynamics of aging societies. But taking LTC costs into account matters also from the perspective of understanding the Preston Curve.

Looking at countries facing high levels of old-age dependency – as measured by LTC spending per capita – we find a surprising tendency that is hard to explain: The Preston Curve disappears! Our paper attempts to understand why these countries do not experience an increasing relationship between income per capita and life expectancy.

It is tempting to offer a trivial answer: The Preston Curve is concave and high-LTC countries generally have high incomes and longevity, so one can expect the relation between income and life expectancy to be weaker in advanced economies.

Although intuitive, this explanation is unsatisfactory. First, the absence of the Preston Curve is not reducible to the standard distinction between intermediate and advanced economies. If we split the countries in **Figure 1** into two groups based on income per capita, we still see the Preston Curve in both groups. Second, evoking the concavity of the Preston Curve does not explain why it vanishes for high-LTC countries: There is a substantial difference between a weaker (increasing) relation between income and life expectancy and a flat or (slightly) decreasing relation (**Figure 2b**).

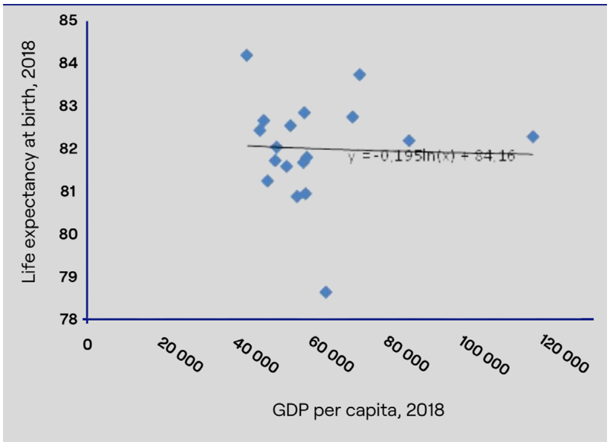


***Figure 2a** shows the relation between income per capita and life expectancy for countries with low LTC spending per capita.*

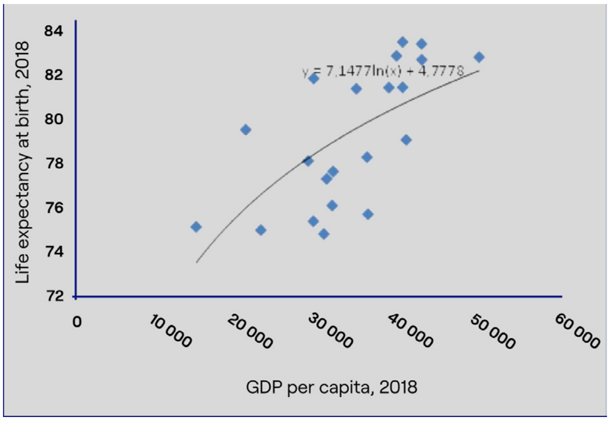


***Figure 2b** shows the relation between income per capita and life expectancy for countries with high LTC spending per capita.*

How does your paper solve this riddle?

We study a simple dynamic model in which survival to old age depends on individuals' decisions about preventative health spending, which are made while anticipating future LTC costs at the old age. In this setting, LTC costs can have ambiguous, contrasting effects. On the one hand, they can encourage savings, generating capital and income that lead to higher preventive health spending, and, hence, higher life expectancy. On the other hand, LTC costs can also reduce the incentives for investing in preventive health because they make old age less attractive, reducing life expectancy.

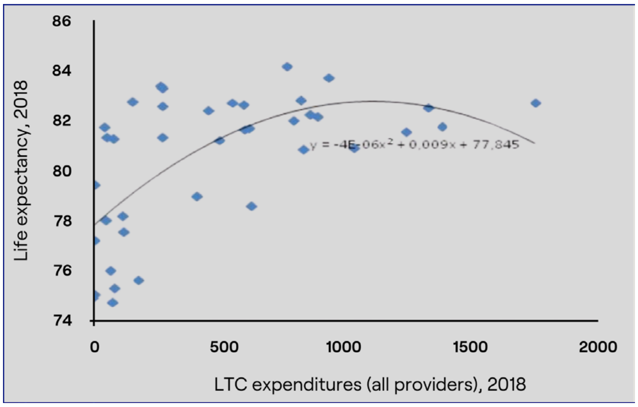
Our model shows that savings and preventive health investment can be complements despite the direct competition for resources. We also show that, all else equal, higher LTC costs increase savings and reduce preventive health investment. Further, the dynamics of capital accumulation and those of preventive health investment are shown to be variable and finite. Interestingly, as old-age dependency favors capital accumulation, it can help to reduce poverty.

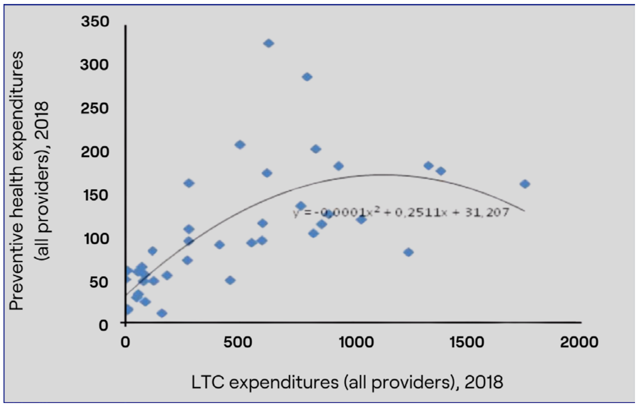
Preston's discovery underlines the importance of economic growth for improving health outcomes. It suggests that a multisectoral approach will be crucial to address health inequalities and development challenges

In reexamining the Preston Curve, we are also able to connect two other general tendencies to the dynamics of capital accumulation and income growth. First, the inverted-U relation between LTC costs and life expectancy (**Figure 3**): above a certain level, higher LTC spending is associated with lower life expectancy. Second, the inverted-U relation between LTC and preventive health spending (**Figure 4**): above a certain level, higher LTC spending is associated with lower preventive health spending (which usually raises life expectancy).

Our model suggests that anticipated LTC costs do have a variable effect on preventive health investment. Together with the positive impact of old-age dependency on capital accumulation, this provides an explanation for the missing Preston Curve.

Many other interesting analyses are possible. In particular, one may develop more complex models, including, for instance, endogenous LTC spending through choices about living arrangements or nursing homes.





In low-LTC economies, **Figure 3** (left) shows that a rise in LTC costs is associated with higher life expectancy. However, above a certain level, higher LTC spending is associated with lower life expectancy. In contrast, **Figure 4** (right) shows that a rise in LTC costs is associated with higher preventive health spending. However, above a certain level, more LTC spending is associated with lower preventative health spending.

SUMMING UP

- Discovered more than 40 years ago, the Preston Curve establishes an increasing relation between economic prosperity (measured by income per capita) and longevity (measured by life expectancy).
- Looking at recent data, our researchers identify the disappearance of the Preston Curve in aging societies.
- Their simple model provides an explanation for this mystery, showing that old-age dependency favors capital accumulation but has a variable effect on preventive health investment and life expectancy.

FURTHER READING

"Life Expectancy, Income and Long-Term Care: The Preston Curve Reexamined" and other publications by Gregory and Emmanuel are available to view on the TSE website.

Events and Prizes

Sustainable Finance Conference

TSE held its third Sustainable Finance Conference on December 7-8 in Toulouse. In the same vein as the two previous editions, this event provided a platform to delve into recent scientific contributions that enhance our understanding of sustainable finance and its implications for modern society.

Presentations and discussions at the conference covered a large range of topics, such as climate risks and regulation in finance, financial stability, privacy issues, fintech and the AI revolution in finance.

Led by TSE researcher **Sophie Moinas**, the "Climate risks and regulation" panel discussion included a public regulator, academics, and representatives from the corporate sector. They provided valuable insights into the latest advances in measuring compagnies vulnerability to climate change. The discussion illuminated the challenges that need attention and outlined the next steps.

Several experts were invited to share their views during this round-table discussion. As they said, the insurance and reinsurance industry has been among the first to be aware that it will be directly impacted by the climate change and the frequency of extreme events. As a result, risk research has enabled the sector to develop expertise in quantifying these exposures.

Sustainability is a mix of self-adopted constraints relating to our ambition and legal obligations linked to European Union legislations

Marie-Laure Fandeur

Marie-Laure Fandeur, Head of P&C ESG at SCOR, described the use of hazard, vulnerability, and financial modules in assessing risks. She also highlighted the fact that the pressure exerted by EU regulations to promote transparency is viewed favorably by reinsurers such as SCOR.

A subsequent presentation by **Laurent Clerc, Director for Research and Risk Analysis at Autorité de Contrôle Prudentiel et de Résolution (ACPR)**, explored France's regulatory framework for banks and insurers on climate issues. Next, **Jean-Philippe Desmartin, Head of Responsible Investment at Edmond de Rothschild Asset Management**, described its expertise as a European investor, while **Sébastien Pouget, professor of Finance at TSE**, questioned the link between different regulations and the trade-off between financial stability and the need for new climate regulations.

Public Economics & Aging Conference

TSE organized the Public Economics and Aging Conference with the support of SCOR Foundation for Science on May 23 and 24.

Some 20 researchers gathered in Toulouse for this conference structured around three themes: Aging Economics, Environmental Policy and Public Finance. Academics who shared their insights were affiliated to a wide range of prestigious research institutions across the world including **University of York, Université du Québec, Universidad de Los Andes,** and **University of Liège.**

Prizes

The SCOR Risk Markets and Value Creation Chair supports the prizes organized within the framework of the 2023 annual seminar of the European Group of Risk and Insurance Economists (EGRIE).


Moritz Loewenfeld


Jiakun Zheng

SCOR-EGRIE Young Economist Best Paper Award

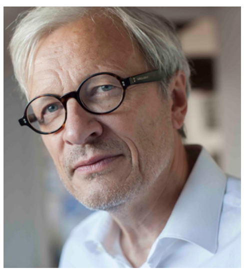
Congratulations to **Moritz Loewenfeld (TSE)** and **Jiakun Zheng (Aix-Marseille School of Economics)** who received the SCOR-EGRIE Young Economist Award for their paper:

"Uncovering correlation sensitivity in decision making under risk"

SCOR–The Geneva Risk and Insurance Review Best Paper Award


Enrico Biffis


Alexis Louaas


Pierre Picard

Congratulations to **Enrico Biffis (Imperial College London & Nanyang Business School), Erik Chavez (Imperial College London), Alexis Louaas (Ecole polytechnique & Square Research Center)** and **Pierre Picard (Ecole polytechnique)** who are the 2023 laureates for their paper:

"Parametric insurance and technology adoption in developing countries"

Scientific contributions

Articles in peer-reviewed journals

- **Helmuth Cremer**, and **Chiara Canta** - ''Asymmetric information, strategic transfers and the design of long-term care policies'', Oxford Economic Papers, vol. 75, n. 1, January 2023, pp. 117–141
- **Stéphane Villeneuve**, and **Jessica Martin** - ''Risk-sharing and optimal contracts with large exogenous risks'', Decisions Econ Finan. February 2023; 46(1): 1–43.
- **Philippe De Donder, Marie-Louise Leroux**, and **François Salanié** - ''Advantageous selection without moral hazard'', Journal of Risk and Uncertainty, May 2023
- **Francesca Barigozzi, Helmuth Cremer**, and **Jean-Marie Lozachmeur** - ''Gender wage and longevity gaps and the design of retirement systems'', Journal of Economic Behavior & Organization, Volume 209, May 2023, Pages 263-287
- **Olivier Armantier, Jérôme Foncel**, and **Nicolas Treich** - ''Insurance and portfolio decisions: Two sides of the same coin?'', Journal of Financial Economics, Volume 148, Issue 3, June 2023, Pages 201-219
- **Romain Espinosa**, and **Nicolas Treich** - ''Eliciting Non-hypothetical Willingness-to-pay for Novel Products: An Application to Cultured Meat'', Environmental and Resource Economics, vol. 85, August 2023, p. 673–706
- **Philippe De Donder, Martin Boyer, Claude Fluet, Pierre-Carl Michaud**, and **Marie-Louise Leroux** - ''La mauvaise perception des risques de longévité et de dépendance ne suffit pas à expliquer la faiblesse du marché de l'assurance dépendance (au Canada)'', Revue d'économie financière, n. 151, November 2023
- **Chiara Canta, Helmuth Cremer**, and **Firouz Gahvari** - ''Welfare-improving tax evasion'', The Scandinavian Journal of Economics, vol. 126, n° 1, janvier 2024, p. 98–126
- **Francesca Barigozzi**, and **Helmuth Cremer** - ''Shining with the stars: Competition, screening, and concern for coworkers' quality'', Games and Economic Behavior, vol. 144, 2024, p. 250–283

Working papers

- **Francesca Barigozzi, Helmuth Cremer**, and **Emmanuel Thibault** - ''The motherhood wage and income traps'', TSE Working Paper, n° 23-1426, April 2023
- **Claire Borsenberger, Helmuth Cremer, Denis Joram, Jean-Marie Lozachmeur**, and **Estelle Malavolti** - ''Testing for fragility: a valuable public policy and an opportunity for postal operators'', TSE Working Paper, n° 23-1433, May 2023
- **Catarina Goulão,** and **Agustín Pérez-Barahona** - ''Health aspirations and the epidemic of non-communicable chronic diseases'', TSE Working Paper, n° 21-1236, July 2021, revised June 2023
- **Philippe De Donder, Bertrand Achou, Franca Glenzer, Minjoon Lee**, and **Marie-Louise Leroux** - ''At Home versus in a Nursing Home: Long-term Care Settings and Marginal Utility'', CESifo Working Paper No. 10482, June 2023
- **Emmanuel Thibault,** and **Grégory Ponthière** - ''Life Expectancy, Income and Long-Term Care: The Preston Curve Reexamined'', TSE Working Paper, n° 23-1474, October 2023
- **Philippe De Donder**, and **David Bardey** - ''A Welfare Analysis of Genetic Testing in Health Insurance Markets with Adverse Selection and Prevention'', TSE Working Paper, n. 19-1035, September 2019, revised January 22, 2024
- **Stéphane Villeneuve, Bruno Biais, Hans Gersbach, Jean-Charles Rochet**, and **Ernst-Ludwig von Thadden** - ''Dynamic Contracting with Many Agents'', TSE Working Paper, n° 24-1511, February 2024

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