

Nobel Prize 2025: How Innovation Drives Economic Growth

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Nobel Prize 2025 Latest News

- The 2025 Nobel Prize in Economics has been awarded to Joel Mokyr, Philippe Aghion, and Peter Howitt for their pioneering work in explaining innovation-driven economic growth.
- The Royal Swedish Academy of Sciences announced that half the prize will go to Mokyr, with the remaining half shared by Aghion and Howitt.
- Their research highlights how technological progress and innovation act as key drivers of long-term prosperity.

2025 Economics Nobel Laureates: Pioneers of Innovation-Led Growth

- **Joel Mokyr** (Netherlands), Professor at Northwestern University, was recognised “**for identifying the prerequisites for sustained growth through technological progress.**”

- Philippe Aghion (France), Professor at Collège de France, INSEAD, and LSE, and Peter Howitt (Canada, 1946), Professor at Brown University, jointly received the other half of the prize **“for the theory of sustained growth through creative destruction.”**
- Their combined work has deepened global understanding of how innovation, knowledge, and competition fuel long-term economic prosperity.

Joel Mokyr’s Theory of “Useful Knowledge”

- Joel Mokyr’s research seeks to explain **why global economic growth has accelerated and sustained over the past 200 years**, breaking centuries of stagnation.
- His work, grounded in economic history, identifies how the systematic creation and application of knowledge triggered the Industrial Revolution and continues to sustain progress today.

The Concept of “Useful Knowledge”

- Mokyr proposed that sustained growth depends on a continuous flow of **“useful knowledge”**, which he divided into two interconnected parts:
 - **Propositional Knowledge:** Understanding *why* things work — derived from scientific theories and natural observations.
 - **Prescriptive Knowledge:** Knowing *how* things work — practical, reproducible instructions or “recipes” that enable implementation, such as technical drawings or process manuals.
- He argued that before the **Industrial Revolution**, innovators possessed ample **propositional knowledge** but lacked strong **prescriptive knowledge**, limiting their ability to apply scientific ideas to real-world production.

The Turning Point: Scientific Revolution and Reproducibility

- According to Mokyr, the transformation began in the 16th and 17th centuries, when scientists started to use precise measurements, controlled experiments, and reproducible results.
- This new scientific discipline created a feedback loop between theoretical understanding and practical application — a dynamic exchange that laid the foundation for continuous technological improvement.

From Theory to Application: Examples of “Useful Knowledge”

- Mokyr illustrated his theory with examples such as:
 - The **steam engine’s evolution**, enabled by deeper insights into **atmospheric pressure and vacuums**.
 - The **advancement of steel production**, made possible by understanding how **oxygen reduces carbon content in molten iron**.
- These innovations exemplify how tighter feedback between scientific discovery and practical engineering created **self-sustaining progress**, driving industrialisation and modern economic growth.

Policy Lessons from Joel Mokyr's Work: Skills and Openness as Pillars of Sustained Growth

- Joel Mokyr's research offers two key policy insights for achieving long-term, innovation-led economic growth.
- First, new ideas succeed only when supported by **abundant practical, technical, and commercial skills**.
 - The policy takeaway is that governments must invest heavily in skilling and vocational training to transform innovation into sustained prosperity.
- Second, Mokyr emphasised that **societies must remain open to change**.
 - Innovation inevitably creates winners and losers, and resistance from entrenched interests can stifle progress.
 - Therefore, policymakers must foster a culture that embraces technological disruption and mitigates its social costs through inclusive, adaptive institutions.

Aghion and Howitt's Theory of Creative Destruction: Modelling Innovation and Growth

- Economists **Philippe Aghion** and **Peter Howitt** built a **mathematical model of "creative destruction"**, explaining how innovation drives economic growth by continuously replacing old technologies and firms with new ones.
- Their model assumes that **firms invest in research and development (R&D)** to create new, patentable products, giving them temporary monopoly power.
- However, innovation is **cumulative and competitive** — a new firm can develop a better product that displaces the incumbent, shifting profits and market dominance to itself.
- This constant cycle of **innovation and replacement** fuels **long-term economic growth**, but also brings instability and structural change.
- Aghion and Howitt's framework allows economists to study the **optimal level of R&D investment** in a **free-market economy**, balancing innovation incentives against the disruptions caused by technological progress.

Balancing Innovation and Efficiency: How Much Should Governments Subsidise R&D

- According to Philippe Aghion and Peter Howitt's model of creative destruction, government support for research and development (R&D) requires a careful balance between encouraging innovation and avoiding inefficiency.
- On one hand, when new innovations replace old technologies, society continues to benefit from the older inventions even after their creators stop earning profits.
 - This social spillover effect justifies public subsidies for R&D, ensuring firms remain motivated to innovate despite diminishing private returns.
- On the other hand, when an innovation offers only incremental improvements but yields disproportionately high monopoly profits for the innovating firm, excessive R&D spending can become socially inefficient.

- In such cases, subsidies may overstimulate research investment with limited societal gains.
- Thus, the **optimal level of R&D support depends on the structure of each economy, the pace of technological change**, and the **extent of knowledge spillovers** — a balance policymakers must strike to achieve sustained, innovation-driven growth.

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