



Finance, Innovation, and the Transition to an AI-Driven Society

Giovanni Antonio Cossiga

Former Chairman of the Board of Auditors, Policlinico Umberto I, Sapienza University of Rome

Abstract: This article explores the transition from the declining industrial model of the West to a new phase of development shaped by artificial intelligence, robotics, and advanced technological innovation. It argues that the financial expansion following the 2008-2010 crisis should not be read only as speculative excess, but also as part of a broader process through which markets supported the relocation of industrial capacity and the emergence of new post-industrial sectors. The analysis then connects financial dynamics with the rising costs of innovation, suggesting that stock market valuations may function as an additional source of equilibrium for enterprises engaged in research, digital transformation, and AI-based development. Beyond the economic dimension, the article considers the social implications of artificial intelligence and robotics, including their possible contribution to education, assistance for older people, public services, agriculture, and scientific research. At the same time, it stresses the need for human responsibility, ethical supervision, and institutional control, especially where autonomous systems may affect rights, safety, and social relations. The article concludes by asking whether the new technological horizon can help reduce the dominance of solvency and monetary hierarchy in collective life, opening instead a model of development more closely linked to social inclusion, environmental transition, and the quality of human existence.

Keywords: market dynamics, speculative waves, technological innovation, artificial intelligence, collective development.

INTRODUCTION

Some phases in the history of economic thought suggest that financial dynamics should not be interpreted solely as speculative phenomena, especially when they accompany major productive and technological transformations. After the financial crisis of 2008-2010, which represented one of the most evident manifestations of contemporary speculation and caused significant damage to the global economy, one might have expected a slowdown in the growth of valuations. In the following decade, however, the opposite occurred: stock markets continued to grow at an accelerated pace, supporting a phase of industrial reorganization and preparation for the new economy of artificial intelligence. In this context, finance appears not only as an amplification of risk, but also as a possible instrument of transition when it helps direct resources toward new development trajectories.

In short, we might think that the 2008-2010 crisis was less a collapse than the record of a transition: from an industrial model that had become outdated for the West to a new field of research and development. It leaves the impression that the near elimination of industrial development was necessary not so much to create physical space, but to initiate a new phase of development that proved costly, and that the financial system, through the growth of stock-market valuations, had made it possible to maintain the economic equilibrium of the previous industrial model. The economic balance of the current post-

industrial phase is not very different: in order to achieve parity in the income statement, it must rely, in addition to ordinary operating revenues, on the financial economy, which therefore carries stock-market valuations with it and makes them act as a supplement to ordinary revenues. It should not be surprising that the economy of this new phase of development can progress only if all potential forms of support contribute. We may therefore hypothesize that the financial crisis at the end of the first decade of the 2000s marked the moment of transition and transfer from the industrial model to the new creative reality of AI.

Dalla Rust Economy alla società dell'innovazione

What can we expect from this new idea of development, if not a greater capacity to intervene on behalf of the poorest and most marginalized classes and a strengthening of social support policies? Human creativity, integrated with the potential of artificial intelligence, can help improve soil fertility and agricultural productivity, increasing the availability of goods essential to life. Artificial intelligence also finds application in numerous fields, especially in research and study: from hospitals to universities, from research centers to all contexts in which human activity seeks to expand the boundaries of knowledge. This variety of applications, from agricultural productivity to scientific progress, explains the need to move beyond the Rust Economy and to define new development objectives in the age of artificial intelligence. In this framework, improved AI performance can also offer concrete assistance to older people, for example through reliable domestic robots capable of supporting them in daily life and fostering broader social participation.

QUOTATIONS, INNOVATION AND DEVELOPMENT OF HUMANITY

The economic equilibrium of the new class of firms engaged in advanced technological development has been mentioned above. These companies have to make very high investments, often exceeding the immediate ability of sales revenues to fully cover their costs. This results in a structural strain on the income statement, which can only be offset through a combination of ordinary income, expectations of future growth and financial market support.

The economic framework therefore becomes clearer: financial markets can play a supporting role when they accompany the needs of a new production phase through a gradual and stable rise in valuations. In a different form, this recalls the earlier financial context that facilitated the transfer of part of the West's industrial capacity to Asia. That complex process was also made possible by financial markets, which helped increase the value of industrial firms and provide the additional resources needed to complete the relocation successfully.

Today, the economic world's attention is focused on artificial intelligence, regarded as a decisive stage in the acceleration of development. Even in this phase, however, the success of AI research and applications depends to a significant extent on the participation of the financial system. As occurred in the transition from the Western industrial economy to the relocation of part of the production facilities to Asia, the current transformation also requires substantial capital, expectations of growth, and sustained support from the markets. In this sense, finance appears not merely as a speculative factor, but as a necessary

component of the innovation process. The convergence of these forces may be understood as a process that is still partly obscure, yet capable of accompanying the difficult trajectory of development. Nevertheless, a shadowed area remains within this process. The reference to the invisible hand makes it possible to describe the convergence of autonomous financial decisions which, although arising from separate interests, ultimately support the rise in stock-market valuations and accompany the transition from the previous path of industrial development to the new frontier of technological innovation.

Finance and the New Technological Frontier

These processes can be viewed positively when they form part of a development path aimed at expanding human capabilities. The prospect of robots equipped with artificial intelligence and significant operational autonomy opens scenarios that naturally inspire wonder. Such tools could support human beings in scientific, technical, and creative activities, not by replacing human responsibility in decision-making, but by broadening opportunities for collaboration in fields where knowledge, imagination, and the capacity to choose to remain decisive.

Beyond the qualities we attribute to robots, the mere possibility that increasing autonomous entities may work alongside human beings in everyday life represents a major transformation. From childhood, becoming accustomed to intelligent tools capable of interacting with the human environment could profoundly reshape children's imagination and support human activity in laboratories, offices, and many other settings. Even if some forecasts, such as those made by Elon Musk, appear bold and difficult to achieve in the short term, it remains plausible that some of these prospects may materialize in a more distant future. In that case, the time required for their implementation would become less important, since these changes would mainly concern future generations, likely to live longer and in a technological environment very different from our own. In conclusion, the value of technological innovation cannot be evaluated exclusively in terms of increasing economic growth but must be traced back to its ability to promote more balanced, socially inclusive development processes consistent with the expansion of human possibilities. At this point, a fundamental question arises: will the future outlined in the previous pages, supported by the forces generated by the new horizon of cultural, technological and social development, be sufficient to mitigate the tensions that fuel the numerous conflicts underway in the world today? And this new model of collective life will help to reduce the centrality of solvency as the dominant criterion of economic and social existence

The pessimism of reason leads us to a negative answer, because the current prevalence of right-wing politicians both in the United States and in Europe encourages us to believe that these political presences are a sign that, in the West as in the East, those who base power on solvency still prevail. This may be a sign of fragility in the hierarchy of money, prompted by anxiety over a future of change. In other words, we observe that the hierarchy of money is becoming increasingly aligned with the hierarchy founded on oil. Yet oil today marks, not only because of the war in the Middle East, an inevitable uncertainty in prices and availability; it is also an unmistakable sign of the loss of centrality of fossil fuels, because of the unsustainable damage they inflict on the climate of our Earth. It is true that, at current rates, gas and oil reserves are capable of lasting for at least another fifty years. Their relative availability and still high prices remain a source of inflation and

instability, but they cannot halt the transition toward a new model of development: a model in which technological innovation, collective responsibility, and overcoming dependence on fossil fuels must proceed together, if we wish to open a historical phase less dominated by the hierarchy of money alone and more oriented toward the quality of human life.



Robot umanoide e intelligenza artificiale nella transizione verso nuove forme di sviluppo sociale e tecnologico.

ROBOTS, ARTIFICIAL INTELLIGENCE AND THE TRANSFORMATION OF SOCIAL LIFE

For solvency to cease being the main basis of social hierarchy, the symbolic and material role of money may need to diminish. The emergence of artificial forms of life, increasingly able to imitate human appearance and behavior, introduces a new boundary between humans and machines. Even if robots were to achieve a high degree of aesthetic similarity, they would still retain features that reveal their artificial nature and prevent full identification with human beings. The interest in robotics lies precisely in this ambivalence: the machine may appear almost alive, yet it remains a technical instrument without autonomous subjectivity. From this perspective, robots could provide support in many social situations, including care for older people living alone, assistance for those without family networks, and services in educational, university, hospital, and childcare settings.

The use of robots and artificial intelligence systems could therefore open significant scenarios in fields such as education, social assistance, civil protection, and security. In education, these tools should not be conceived as substitutes for teachers, but rather as devices supporting lesson review, practice exercises, and the personalization of learning paths, especially in contexts marked by scarce resources. Similarly, in operational settings, machines endowed with controlled autonomy could be used for risky tasks, reducing people's direct exposure to dangerous situations. However, a clear distinction must be made between executive capacity and decision-making responsibility: a machine can process instructions and react to certain stimuli, but it does not possess intentionality, moral judgment, or awareness of conflict comparable to that of human beings. For this reason, the use of robots in sensitive contexts should always remain subject to the control, supervision, and responsibility of human beings.

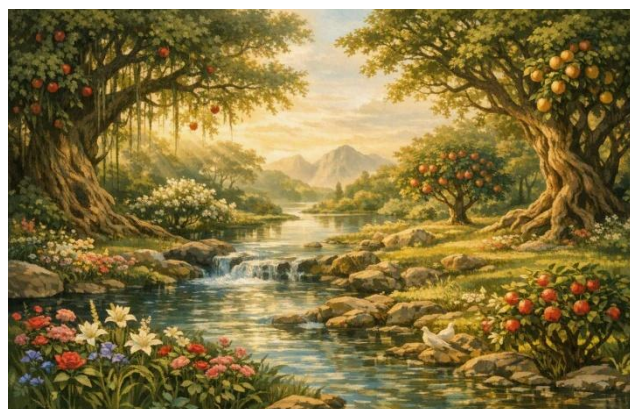
Robotics, Human Oversight, and the Limits of Autonomy

From this perspective, the use of a diversified range of robots could also be considered in police, surveillance, and territorial-control activities, provided that it is limited to support,

prevention, and risk-reduction functions. Such devices could help contain potentially dangerous situations, operating alongside the competent authorities and on the basis of previously defined criteria. Such use, however, would require a rigorous regulatory framework capable of ensuring the proportionality of interventions, the protection of fundamental rights, procedural transparency, and the continued assignment of decision-making responsibility to human beings. Only under these conditions could robotics be integrated into the most sensitive social contexts without becoming an instrument for the automation of power or the reduction of individual guarantees.

However, without self-awareness, a robot will always remain suitable only under the control of a human being, without the capacity to perform tasks in full autonomy. We are not in a position to say whether this goal can be achieved within a realistic timeframe or not. Nevertheless, it remains an indispensable objective. For now, robots can have a kind of brain: the Spanish experiment creates an **artificial cerebellum** to make robots move more naturally and interact more effectively with human beings. We are on the right path, through international collaboration, toward an automaton capable of mimicking human movements. It has a semblance of self-awareness; it has a **skeleton**, and its **joints** must be light, strong, and durable. Finally, **carbon fiber, PEEK, and PPS** are materials capable of withstanding repeated movements, impacts, heat, and heavy loads. In short, the robot is certainly not a living being, yet it is already resistant to external stress. Robotics has advanced rapidly, reaching increasingly autonomous, useful systems capable of performing complex tasks in daily life. The evolution of robotics stems from the human desire to create machines similar to human beings. “They are visible systems. Dr. Frivoli argues that what is more concerning is **the intelligence we do not see**, the one that moves through data and algorithms. That is where we must remain masters of our choices.”

The question that fascinates us is why human beings wish to create machines in their own image. Yet the pursuit of robots increasingly resemble humans may not be the most promising path. The sector could instead follow several lines of development, exploring different possibilities until it identifies the most useful ways to strengthen the role of robotics in modern society. One of the most evident needs is loneliness. In China, a market is already emerging for humanoid robots designed to offer emotional companionship and provide some relief from isolation.



Il Giardino dell'Eden come metafora del limite umano di fronte alla creazione tecnica.

Source: Creazione di intelligenza artificiale (Copilot)

Despite the progress of robotics, the human advantage in concrete operational contexts remains tangible. Logistics, for example, involves repetitive activities and long shifts, in which the endurance and continuity of machines can represent a significant advantage. Yet a deeper question remains open: why do human beings wish to create machines that are increasingly similar to themselves? This impulse could be interpreted as the sign of a creative tension proper to humanity, sometimes pushed to the point of desiring to go beyond its own limits. We thus return, symbolically, to the first steps of the biblical narrative of Creation and to the temptation, insinuated by the serpent, to become like God. From this perspective, the same tension that led Adam and Eve out of the Garden of Eden seems to reappear. For this reason, the idea of a machine conceived as a replica of the human being must be approached with caution: it could represent not only a technical advancement, but also the risk of a new departure from Eden.

CONCLUSION

Technology seems to push us forward like a thin wind, capable of pointing a new direction along the path of development. It is not usual for the financial economy to intervene in support of technological innovation with such intensity and continuity, accompanying it for the time necessary for the maturation of a new historical phase. In this perspective, the transfer of a part of the old industrial apparatus between continents can be interpreted as an attempt to free up not only material, but also cultural and productive, so that human creativity can flow into a different order of development. Artificial intelligence is at the center of this transition: not as a simple technical tool, but as a frontier through which to rethink the relationship between finance, innovation and the future of society.

The favorable wind evoked earlier does not seem to have stopped. In recent decades, rising market valuations helped sustain the economic equilibrium of many companies; today, the same force continues to support the most innovative firms, especially those engaged in research on artificial intelligence and robotics. Without following a single predetermined design, global stock markets have gradually directed capital toward securities linked to technological innovation, helping firms that often face high costs before generating adequate revenues. In this sense, millions of investors, acting through autonomous and widely dispersed judgments, first accompanied the relocation of industrial activity between continents and then supported the new phase of research into robots, artificial intelligence, and technologies destined to transform collective life.

Ultimately, the task of our time is to ensure that finance and technology do not merely accelerate change, but help guide it toward a more humane, balanced, and shared future.

REFERENCES

- Agrawal, A., Gans, J. and Goldfarb, A. (2018), *Prediction Machines: The Simple Economics of Artificial Intelligence*, Harvard Business Review Press;
- Baltes, P.B. and Smith, J. (2003), "New frontiers in the future of aging: from successful aging of the young old to
- Bernard, A.B., Fort, T.C., Smeets, V. and Warzynski, F. (2020), "Heterogeneous Globalization: Offshoring and Reorganization," NBER Working Paper and related firm-level research on offshoring.

- Brendan Brown - 21st Century Monetary Policy: The Federal Reserve from the Great Inflation to COVID-19 September 2022 *The Quarterly Journal of Austrian Economics* 25(2)
- Brander Carter, B. (1970). "An axisymmetric black hole has only two degrees of freedom". *Phys. Rev. Lett.* 26 (6): 331-333. Bibcode:1971PhRvL. 26..331C. doi:10.1103/PhysRevLett.26.331
- Brynjolfsson, E. and McAfee, A. (2014), *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies*, W. W. Norton;
- Brynjolfsson, E., Agrawal, A. and Korinek, A. (2025), *A Research Agenda for the Economics of Transformative AI*, NBER Working Paper No. 34256
- Carstensen, L.L., Sakowitz, D.M. and Charles, S.T. (1999), "Taking time seriously: A theory of socioemotional. selectivity," *American psychologist*, Vol. 54 No. 3, pp. 165-181.
- Collins, W.J. and Margo, R.A. (2004), Historical perspectives on racial differences in schooling in the United States. *Handbook of the economics of education* 1, pp. 1-56.
- Cossiga, G.A. (2018a), "The Search for Inflation on a Constant Basis at 2%", *International Journal of Social Sciences*, Vol. 7, pp. 165-181.
- Cossiga, G.A. (2018b), "Signals from the World of Economics. The Price Constant and the Democratic Issue," *International Journal of Social and Administrative Sciences*, Vol. 3 No. 1, pp. 1-21.
- Cossiga, G.A. (2022), "The Theoretical Bases for Sustainability in Economics", *Social Science and Sustainability Research*, Vol. 3 No. 3
- Cossiga, G.A. (2021), "Between the World of Economics and the World of Physical Sciences There Would be a Link That is Anything but Hypothetical" - *Advances in Social Sciences Research Journal* - Vol. 8, No. 12
- Cossiga, G.A. (2023) "The Economic Sustainability and the Good Government" - *Social Science Humanities and Sustainability Research*. Vol. 3, No. 4, - DOI: 10.22158/sshsr.v3n4p1
- Cicerone, M.T. (1990) - *La vecchiaia - L'amicizia* - Garzanti Editore Spa - ISBN 978-88-11-13175-5
- Diamond, J. (1997), *Guns, germs, and steel: The fates of human societies*. WW Norton & Company.
- Dillaway, H.E. and Byrnes, M. (2009), "Reconfiguring the fourth age: Framing the oldest old", *Journal of Aging Studies*, Vol. 23 No. 3, pp. 182-190.
- Dozon, J. P., Atlani-Duault L.- *Colonization, Development, Humanitarian Aid: Towards a Political Anthropology of International Aid - Ethnology Française - Vol. 41 - SSN 0046-2616*
- Dozon, J. P., (2008) *L'Afrique à Dieu et à Diable. États, ethnies et religions*, Paris, Éditions Ellipses, 138 p.
- Fagan, B.M. (2017), *The great warming: Climate change and the rise and fall of civilizations*. Bloomsbury Publishing.
- Fukuyama, F. (1992), *The end of history and the last man*. Free Press
- Diamandis P.H., Kotler. S, - (2014) *Abbondanza. Il futuro è migliore di quanto pensiate* - Codice edizioni ISBN: 9788875784058
- Gereffi, G., Humphrey, J. and Sturgeon, T. (2005), "The Governance of Global Value Chains", *Review of International Political Economy*, 12(1), 78-104;
- Gittleman, M. and Wolff, E.N. (2004), "Racial wealth disparities: Is the gap closing?", *International Review of Applied Economics*, Vol. 18 No. 4, pp. 457-469.
- Gordon, A.D. (2016), *The political economy of aggrandizement: The United States and territorial expansion, 1800-1860*. Routledge.

- Hume, D - (1751). *An Enquiry Concerning the Principles of Morals*. David Hume, *Essays Moral, Political, and Literary* edited with preliminary dissertations and notes by T.H. Green and T.H. Grose, 1:1-8. London: Longmans, Green 1907.
- Huntington, S.P. (1996), *The clash of civilizations and the remaking of world order*. Simon & Schuster.
- International Labour Organization (2021), "COVID-19 and the world of work", available at: https://www.ilo.org/wcmsp5/groups/public/---dgreports/---comm/documents/briefingnote/wcms_767028.pdf (accessed 19 April 2023).
- Ianchovichina, E. and Martin, W. (2004), "Impacts of China's Accession to the World Trade Organization," *The World Bank Economic Review*, Vol. 18 No. 1, pp. 3-27.
- Bhattasali, D. and Kawai, M. (2001), "Implications of China's Accession to the World Trade Organization," *World Bank Policy Research Working Paper*.
- Lardy, N.R. (1995), "The Role of Foreign Trade and Investment in China's Economic Transformation," *The China Quarterly*, No. 144, pp. 1065-1082.
- International Monetary Fund (2003), "Foreign Direct Investment in China: Some Lessons for Other Countries," in *China: Competing in the Global Economy*, IMF eLibrary.
- Liu, Y. (2022), "Does Foreign Direct Investment Catalyze Local Structural Transformation and Human Capital Accumulation? Evidence from China," *World Bank Policy Research Working Paper No. 9952*.
- Choi, J., Cui, G., Shim, Y. and Shin, Y. (2025), "The Dynamics of Technology Transfer: Multinational Investment in China and Rising Global Competition," *NBER Working Paper No. 34284*.
- Jefferson, T. (1787), Letter to William Stephens Smith. *Founders Online*.
- Kissinger, H (2022) "Ordine Mondiale" RCS Media Group Printed in Italy
- Kose, M.A., Otrok, C. and Whiteman, C.H. (2019), "Understanding fluctuations in emerging market economies", *American Economic Journal: Macroeconomics*, Vol. 11 No. 4, pp. 1-39.
- Krampe, R.T. and Ericsson, K.A. (1996), "Maintaining excellence: deliberate practice and elite performance in young and older pianists," *Journal of Experimental Psychology: General*, Vol. 125 No. 4, pp. 331-359.
- International Journal of Development and Sustainability Vol. 12 No. 6 (2023): 185-211 ISDS www.isdsnet.com 211
- Mearsheimer, J.J. (2014), *The tragedy of great power politics*. WW Norton & Company.
- Milanović, B., Lakner, C. - (2013) "Global Income Distribution: From the Fall of the Berlin Wall to the Great Recession" - Policy Research Working Paper- World Bank
- Naughton, B. (2009), "The Impact of the Tiananmen Crisis on China's Economic Transition," *China Perspectives*, 2009/2, pp. 63-78. DOI: 10.4000/chinaperspectives.4807.
- Naughton, B. (2009), "The Impact of the Tiananmen Crisis on China's Economic Transition," *China Perspectives*, 2009/2, pp. 63-78.
- Naughton, B. (2007), *The Chinese Economy: Transitions and Growth*, MIT Press; Rodrik, D. (2011), *The Globalization Paradox: Democracy and the Future of the World Economy*, W. W. Norton.
- Oliver, M.L. and Shapiro, T.M. (2006) - *Black wealth/white wealth: A new perspective on racial inequality*. Taylor & Francis.
- Milanovich, B. (1998) - *Income, Inequality, and Poverty during the Transition from Planned to Market Economy*. World Bank
- Morse, J. (1783), *A view of Present situation of the United States of America*, John Stockdale London 2ed, pp.468-469
- Piketty, T. (2013), *Capital in the twenty-first century*. Harvard University Press.

- President Jefferson (1859) - "Continental of the United States Policy" The Acquisition on Cuba - in United States - Magazine and Democratic Review, April 1859
- Pope Francis (2014), *Evangelii Gaudium: Apostolic Exhortation on the Proclamation of the Gospel in Today's World*. Vatican Press.
- Raworth, K. (2017), *Doughnut economics: Seven ways to think like a 21st-century economist*. Chelsea Green Publishing.
- Samuelson, W. and Zeckhauser, R. (1988), "Status quo bias in decision making", *Journal of Risk and Uncertainty*- Vol. 1 No. 1, pp. 7-59.
- Sen, A. (2009), *The idea of justice*. Harvard University Press.
- Shapiro, T.M., Meschede, T. and Osoro, S. (2013), *The roots of the widening racial wealth gap: Explaining the Black-white economic divide*. Institute on Assets and Social Policy.
- Soroka, S.N. and Wlezien, C. (2010), *Degrees of democracy: Politics, public opinion, and policy*. Cambridge University Press.
- Smith, A. (1922) *Inquiry into the nature and causes of the wealth of nations*. 1, London, Methuen, 1922.
- Stoller, E.P. (2013), "Learning from wise elders: mental health policies and programs to support a productive aging workforce," *Journal of gerontological social work*, Vol. 56 No. 4, pp. 331-341.
- Zhao, S. (1993), "Deng Xiaoping's Southern Tour: Elite Politics in Post-Tiananmen China," *Asian Survey*, Vol. 33 No. 8, pp. 739-756.
- UNDP (2021a), *Human Development Report 2020: The Next Frontier- Human Development and the Anthropocene*. United Nations Development Programme.
- UNDP (2021b), "Sustainable development goals", available at <https://www.undp.org/sustainabledevelopment-goals> (accessed 19 April 2023).
- OECD - OECD Stat Database, various years