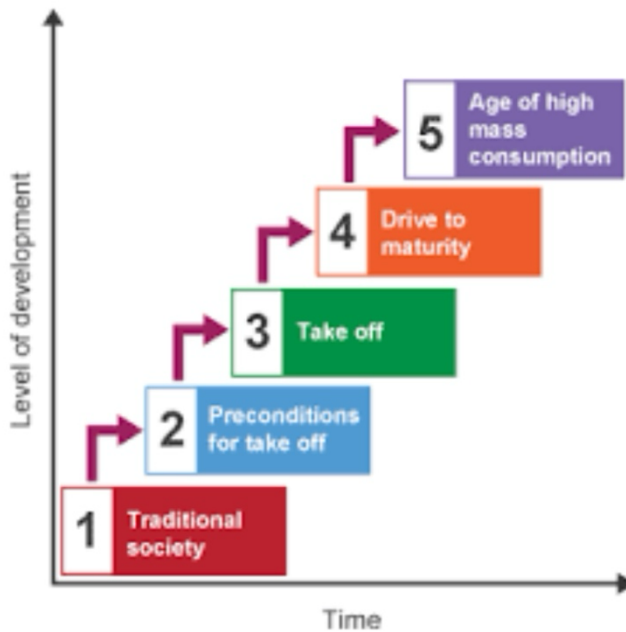


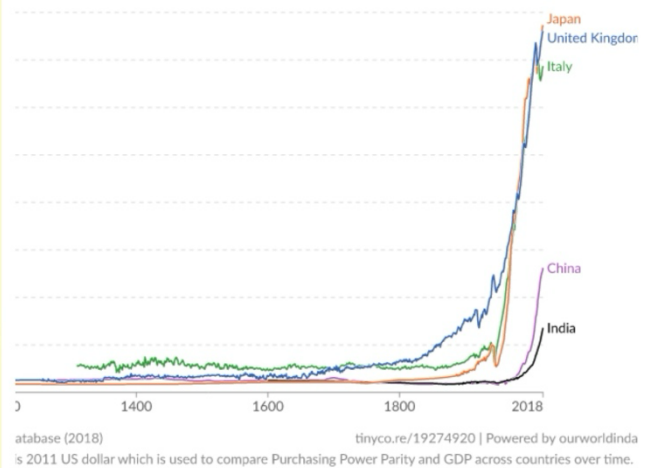
SCIENCE AND GROWTH POLICIES IN THE DEVELOPED AND DEVELOPING WORLD



ick: Worldwide historical real gross domestic
1000 to 2018



on: prosperity, inequality, and planetary limits' in The CORE Team, The Economy 2.0
:: <https://tinyco.re/19274920> [Figure 1.1]



Ph.D. Programme *Global History and Governance*,
Scuola Superiore Meridionale, Naples
Autumn Semester, 2025/2026

Dr Ettore Costa (Scuola Superiore Meridionale)

e-mail: e.costa@ssmeridionale.it

Office place: SSM, Largo San Marcellino 10, 80138 Napoli, third floor

Office hour: by appointment

Description:

The course explores the entanglement of science, technology and economic growth from the nineteenth century to the present, tracing how states, experts and citizens have imagined and managed progress. Beginning with the emergence of growth as a political and economic ideal that kickstarted industrialisation in Europe and acted as a divergence point for the West and non-European civilisations, the course examines how governments mobilised scientific research and technological innovation as instruments of national strength, welfare and modernity.

Through case studies spanning imperial powers, socialist regimes, liberal democracies, developmental states and postcolonial societies, we investigate the institutions, ideologies and policy tools that linked scientific advance to economic planning and global competition. Topics include the rise of research bureaucracies and technocracy before 1945; postwar “growthmanship” and the global diffusion of planning; the developmental ambitions of newly independent nations; the crisis of growth in the 1970s; and twenty-first-century debates over degrowth, ecomodernism and techno-optimism.

The course combines primary sources (policy reports, speeches, planning documents) with recent historical and political-economic scholarship, encouraging students to think comparatively about the politics of innovation and the moral economies of progress. By the end of the seminar, participants will be able to situate contemporary science and technology policy within a long history of attempts to reconcile knowledge, power and prosperity.

The course consists of 10 sessions, each lasting 2 hours; it is seminar-style and requires active and consistent participation from students, who will be asked to analyse

texts and to discuss the topics of the lessons based on a reading list provided by the instructor.

Students wishing to take part in the course are encouraged to write to the instructor to sign up for updates.

Learning objectives:

- Understand the historical evolution of the concept of economic growth and its relationship to science and technology from the nineteenth century to the present.
- Comprehend technoscience as a knowledge system and instrument embedded in social relations and involved in the conservation and transformation of social projects.
- Identify the main models and instruments of science and technology policy, in both industrialised and developing countries.
- Recognise the ideological frameworks of growth — liberal, socialist, developmentalist and neoliberal — and their transformations over time.
- Comprehend the role of scientific institutions and experts in processes of economic planning and modernisation.

Readings:

Each session will be organised around reading, analysing and discussing selected essays and articles. Each participant will have to read the mandatory readings and choose another reading from a list. Participants should announce their choice at the previous session, so that each participant will read a different essay and there will be more variety of discussion. Students are invited to propose their own options.

The reading materials will be available online via the Unina digital library or on paper at university libraries or provided by instructors. Contact the instructor to get access to the shared folder.

Course assesment:

- Regular attendance: 10% ;
- Presentation and discussion of course readings: 35% (*Please note: each participant will have to intervene at least once in each session*);
- Final essay and discussion: 55%

Final exam:

The final exam will consist in writing and discussing an final essay on a specific topic to be agreed with Dr Costa by the beginning of December, 5,000 to 8,000 words for PhD Students and 3,000 to 6,000 words for Magistrale students. The paper should be delivered by mid January and they will discussed at the end of January or in February — date to be decided with the students

Use font 12 for the main text, 11 per indented citations; use italics only for emphasis, foreign words and the title of periodicals and books, not citations; choose typeface among Times New Roman, Garamond, Palatino Linotype; double-space; employ first-line indentation for each paragraph. For citation style refer to *The Chicago Manual of Style 17th Edition* Notes and Bibliography: https://www.chicagomanualofstyle.org/tools_citationguide/citation-guide-1.html . Employment of Zotero is strongly encourage

The final two sessions will proceed as follow. Each student will receive beforehand a paper written by another students, which they will have to summarise and critique. The author of the paper will have the opportunity to respond to criticism and explain how they would integrate the comments in a revised version. Finally, the teacher and other students will offer comments.

Sessions:

1. Wednesday 5 November 15-17, Room 2
2. Wednesday 12 November 15-17, Room 2
3. Wednesday 19 November 15-17, Room 2

4. Wednesday 26 November 15-17, Room 2
5. Wednesday 3 Dicembre 15-17, Room 3
6. Wednesday 10 December 15-17, Room 3
7. Wednesday 17 December 15-17, Room 2
8. Wednesday 14 January 15-17, Room 3

Classroom:

Aula 2 and 3, third floor, SSM, Largo San Marcellino 10, 80138 Napoli

Sessions

1. The Origins of Growth and Western Divergence

Wednesday 5 November 15-17, Room 2

Topics:

- From episodic expansion to systematic growth
- The origins of the Anthropocene
- The birth of pro-growth ideologies

Primary sources (pick one):

- J.S. Mill, *Principles of Political Economy* (1848), Book IV (Influence on the Progress of Society on Production and Distribution), Chapter 1-6
- Friedrich List, *The National System of Political Economy* (1841), Chapter 11, 17, 18, 19, 24, 25, 26
- *Manifesto of the Communist Party* (I Bourgeois and Proletarians) and *Capital*, Vol. I, Chapter 15 (Machinery and Modern Industry)

Literature:

- Malm, Andreas. *Fossil Capital: The Rise of Steam-Power and the Roots of Global Warming*. Verso, 2016, Chapter 1, 2, 12
- Mokyr, Joel. *A Culture of Growth: The Origins of the Modern Economy*. Princeton University Press, 2018, Chapter 1-5
- Charbonnier, Pierre. *Affluence and Freedom: An Environmental History of Political Ideas*. With Andrew Brown. Polity Press, 2021, Chapter 1, 3 and 7

2. From Gentlemen Scientists to State-Promoted Science

Wednesday 12 November 15-17, Room 2

Topic:

- The professionalisation of scientists
- State support and the prehistory of science policies

Primary sources:

- King, Alexander. *Science and Policy: The International Stimulus*. Oxford University Press, 1974, Chapter 1 and 2
- Das "Harnack-Prinzip" in der Denkschrift von 1909 - bis heute geistige Grundlage der MPG — <https://www.archiv-berlin.mpg.de/198631/Harnack-Prinzip>
- Pasteur, Louis. *Quelques Réflexions Sur La Science En France*. Gauthier-Villars, 1871, 25-40

Literature (mandatory):

- Pestre, Dominique. 'Science, Political Power and the State'. In *Companion to Science in the Twentieth Century*, edited by John Krige and Dominique Pestre. Routledge, 2003, 61-75.

Literature (pick one):

- Friedrich, Bretislav, and Jeremiah James. 'From Berlin-Dahlem to the Fronts of World War I: The Role of Fritz Haber and His Kaiser Wilhelm Institute in German Chemical Warfare'. In *One Hundred Years of Chemical Warfare: Research, Deployment, Consequences*, edited by Bretislav Friedrich, Dieter Hoffmann, Jürgen Renn, Florian Schmaltz, and Martin Wolf. Springer International Publishing, 2017. https://doi.org/10.1007/978-3-319-51664-6_3, 25-44.

- Johnson, Jeffrey Allan. 'Military-Industrial Interactions in the Development of Chemical Warfare, 1914–1918: Comparing National Cases Within the Technological System of the Great War'. In *One Hundred Years of Chemical Warfare: Research, Deployment, Consequences*, edited by Bretislav Friedrich, Dieter Hoffmann, Jürgen Renn, Florian Schmaltz, and Martin Wolf. Springer International Publishing, 2017. https://doi.org/10.1007/978-3-319-51664-6_8, 135-149
- Weindling, Paul. 'Scientific Elites and Laboratory Organisation in Fin de Siècle Paris and Berlin: The Pasteur Institute and Robert Koch's Institute for Infectious Diseases Compared'. In *The Laboratory Revolution in Medicine*, edited by Andrew Cunningham and Perry Williams. Cambridge university press, 1992, 170-188.
- Hage, Jerald, and Jonathon Mote. 'Transformational Organizations and a Burst of Scientific Breakthroughs: The Institut Pasteur and Biomedicine, 1889–1919'. *Social Science History* 34, no. 1 (2010): 13–46. <https://doi.org/10.1017/S0145553200014061>.
- Shapin, Steven. 'Who Is the Industrial Scientist? Commentary from Academic Sociology and from the Shop-Floor in the United States, ca. 1900-ca. 1970'. In *The Science-Industry Nexus: History, Policy, Implications*, edited by Karl Grandin, Nina Wormbs, and Sven Widmalm. Science history publications, 2004.

3. Science in the Era of Interwar Mass Politics

Wednesday 19 November 15-17, Room 2

Topic:

- The entanglement of technoscience, state power and mass politics
- Science at the service of utopian and reformist projects
- Growth, crisis and Malthusianism
- R&D and economic growth: Romer vs Edgerton

Primary sources:

- Stalin, The Results of the First Five-Year Plan (1933)
- Howard Scott, *Technocracy. Science vs Chaos* (1933)
- Hitler's Confidential Memo on Autarky (August 1936)
- Franklin Delano Roosevelt, Radio Message to 8th Pan American Scientific Congress (speech file 1281), May 10, 1940, <http://www.fdrlibrary.marist.edu/resources/images/msf/msf01323>
- Franklin Delano Roosevelt, FDR addresses NIH 1940 <https://www.fdrlibrary.org/nih-footage>

Literature (Pick one):

- Hart, David M. *Forged Consensus: Science, Technology, and Economic Policy in the United States, 1921-1953*. Princeton University Press, 1998., Chapter 1, 2, 3 and 4
- Graham, Loren R. *Science in Russia and the Soviet Union: A Short History*. Cambridge university press, 1993, Introduction, Chapter 4, 5 and 6
- Edgerton, David. *England and the Aeroplane: Militarism, Modernity and Machines*. Rev. ed. Penguin, 2013., Chapter 1, 2 and 3
- Herf, Jeffrey. *Reactionary Modernism: Technology, Culture, and Politics in Weimar and the Third Reich*. Cambridge University Press, 1984, Chapter 1, 5, 8

4. Cold War Growthmanship, GDP, and the “Endless Frontier”

Wednesday 26 November 15-17, Room 2

Topic:

- Establishment of growth as primary political goal
- Establishment of Big Science
- Science policies to increase production

Primary sources:

- Vannevar Bush, *Science the Endless Frontier* (1945), 1-22
- *OECD Observer*, 1963, 2, ‘Policies for growth and price stability’, ‘Atomic energy for Europe’s future needs’, ‘A policy for science’
- ‘Science, economic growth and government policy.’ *Minerva* 2, no. 2 (1964): 232–42. <http://www.jstor.org/stable/41822010>.
- *Report of the Central Committee of the CPSU to the 22nd Congress of the Communist Party of the Soviet Union Delivered by N. S. Khrushchev*, October 17, 1961, 22-24, 113-127
- Amaldi, Edoardo. ‘La Cultura Scientifica Nella Società Moderna’. In *Ricerca Scientifica e Sviluppo Economico*, edited by Comitato Nazionale dell’Energia Nucleare, Fausto Borrelli, and Pietro Longo, L’organizzazione, la spesa e il finanziamento della ricerca. Comitato nazionale energia nucleare, 1963.

Literature (pick one):

- Schmelzer, Matthias. *The Hegemony of Growth: The OECD and the Making of the Economic Growth Paradigm*. Cambridge University Press, 2017, 75-83, 117-141, 167-214
- Hart, David M. *Forged Consensus: Science, Technology, and Economic Policy in the United States, 1921-1953*. Princeton University Press, 1998., Chapter 6, 7 and 8

- Reid, Susan E. 'The Khrushchev Kitchen: Domesticating the Scientific-Technological Revolution'. *Journal of Contemporary History* 40, no. 2 (2005): 289–316. <https://doi.org/10.1177/0022009405051554>; Guth, Stefan. 'One Future Only. The Soviet Union in the Age of the Scientific-Technical Revolution'. *Journal of Modern European History* 13, no. 3 (2015): 355–76. <https://doi.org/10.17104/1611-8944-2015-3-355>; Feygin, Yakov. *Building a Ruin: The Cold War Politics of Soviet Economic Reform*. Harvard University Press, 2024. <https://doi.org/10.4159/9780674296664>., Chapter 1 (14-40) and Chapter 3 (62-93)
- Krige, John. *American Hegemony and the Postwar Reconstruction of Science in Europe*. MIT Press, 2014, Chapter 1, 3, 9

5. Modernization, Developmental States and Alternatives in the Global South

Monday 2 December 17-19 Aula 2

Topic:

- The paradigm of modernisation
- Japan as a model of developmental state
- Westernisation and alternative paths to development
- Development aid

Primary sources:

- Rostow, Walt Whitman. *The Stages of Economic Growth: A Non-Communist Manifesto*. 3rd ed. Cambridge university press, 1990, Chapter 2 and 5
- King, Alexander, and Aklilu Lemma. 'Science and Technology for Development'. In *Issues of Development: Towards a New Role for Science and Technology*, edited by Maurice Goldsmith and Alexander King. *International*

Symposium on Science and Technology for Development, Oxford New York. Pergamon Press, 1979, 7-31.

- Nehru, Jawaharlal. *The Discovery of India*. Oxford University Press, 1989, 395-415 ; 505-515
- Kwame Nkrumah's full speech at the laying of foundation stone for the construction of Ghana Atomic Reactor at Kwabenya, on 25 November 1964, <https://medium.com/kwame-nkrumahs-works/kwame-nkrumahs-full-speech-at-the-laying-of-foundation-stone-for-the-construction-of-ghana-atomic-8e5c2a4d6705>

Literature (Pick one):

- Singh, S. 2002. Nehru: Science and Technology. In D.S. Chaudhary (ed.), *Nehru and Nation Building*. Jaipur: Aalekh Publishers; Kumar, Suneel. 'Nuclear Technology and Nehru's Outlook'. In *Revisiting Nehru in Contemporary India*, edited by Baljit Singh. Routledge, 2020; Sherman, Taylor C. *Nehru's India: A History in Seven Myths*. Princeton University Press, 2022, Chapter 7
- Unger, Corinna R., Iris Borowy, and Corinne A. Pernet. 'The History of Development: A Critical Overview'. In *The Routledge Handbook on the History of Development*, edited by Corinna R. Unger, Iris Borowy, and Corinne A. Pernet. Routledge, 2022.
- Sackeyfio-Lenoch, Naaborko. 'Decolonization, Development, and Nation Building in Ghana-Asia Relations, 1957-1966'. *The International Journal of African Historical Studies* 49, no. 2 (2016): 235–53. Ram, Ronki. 'Jawaharlal Nehru, Neo-Liberalism and Social Democracy: Mapping the Shifting Trajectories of Developmental State in India'. In *Revisiting Nehru in Contemporary India*, edited by Baljit Singh. Routledge, 2020.
- Halsmayer, Verena, and Daniel Speich Chassé. 'Economic Growth and the Object of Development'. In *The Routledge Handbook on the History of*

Development, edited by Corinna R. Unger, Iris Borowy, and Corinne A. Pernet. Routledge, 2022. Iandolo, Alessandro. 'Socialist Approaches to Development'. In *The Routledge Handbook on the History of Development*, edited by Corinna R. Unger, Iris Borowy, and Corinne A. Pernet. Routledge, 2022.

- Brodén Gyberg, Veronica. *Sweden's Research Aid Policy: The Role of Science in Development*. Taylor & Francis, 2023, Chapter 1 and 2

6. Limits, Environmentalism, and the Politics of Restrained Expectations (1968–1990s)

Wednesday 3 Decembre 15-17, Room 3

Topic:

- Growing environmental awareness
- The perception of physical limits and the end of growth
- Reduction of expectations after the end of the boom

Primary sources:

- Meadows, Donella H., Dennis L. Meadows, Jørgen Randers, and William W. Behrens III. *The Limits to Growth: A Report for The Club of Rome's Project on the Predicament of Mankind*. Universe Books, 1972., Introduction, Chapter 4, Commentary
- Valéry Giscard d'Estaing, La mise en oeuvre du programme de développement économique et d'aide aux investissements (1975)
- Jim Callaghan, We used to think you could spend your way out of recession (LPACR 1976)
- Jimmy Carter, Crisis of Confidence (Malaise Speech) 1979
- Enrico Berlinguer, 'Il compromesso nella fase attuale,' *Rinascita*, 24 agosto 1979

Literature (Pick one):

- Macekura, Stephen. *Of Limits and Growth: The Rise of Global Sustainable Development in the Twentieth Century*. Cambridge University Press, 2015. <https://doi.org/10.1017/CBO9781139680509>, Introduction, Chapter 4
- Gross, Stephen G. *Energy and Power: Germany in the Age of Oil, Atoms, and Climate Change*. Oxford University Press, 2023, Introduction and Chapter 6
- Robertson, Thomas. *Malthusian Moment: Global Population Growth and the Birth of American Environmentalism*. Rutgers University Press, 2012, Chapter 6 and Chapter 8
- Caradonna, Jeremy L. 'An Incompatible Couple: A Critical History of Economic Growth and Sustainable Development'. In *History of the Future of Economic Growth: Historical Roots of Current Debates on Sustainable Degrowth*, edited by Iris Borowy and Matthias Schmelzer. Routledge, Taylor & Francis Group, 2017. <https://doi.org/10.4324/9781315543000>. Kirchhof, Astrid Mignon, and John Robert McNeill, eds. *Nature and the Iron Curtain: Environmental Policy and Social Movements in Communist and Capitalist Countries, 1945-1990*. University of Pittsburgh Press, 2019, Introduction

7. Continuous Modernism Outside the West: China and the Asian Tigers

Wednesday 17 December 15-17, Room 2

Topic:

- Successful development policies and the role of technology
- Continuous modernism paradigm outside Europe
- Singapore, South Korea, China

Primary sources:

- Deng Xiaoping's Speeches on Science and Technology

- Kuan Yew, Lee. *From Third World to First: The Singapore Story 1965-2000:Memoirs of Lee Kuan Yew Vol. 2*. Marshall Cavendish, 2012, Chapter 4
- Xi Jinping's Sept. 2020 Speech on Science and Technology Development.

Literature (mandatory):

- Wade, Robert. *Governing the Market: Economic Theory and the Role of Government in East Asian Industrialization*. Princeton University Press, 2004, Introduction and Chapter 7

Literature (Pick one):

- Naughton, Barry. *The Chinese Economy: Adaptation and Growth*. 2nd ed. The MIT press, 2018, Chapter 7 and 15;
- Koh, Winston T.H., and Poh Kam Wong. 'Competing at the Frontier: The Changing Role of Technology Policy in Singapore's Economic Strategy'. *Technological Forecasting and Social Change* 72, no. 3 (2005): 255–85.
<https://doi.org/10.1016/j.techfore.2004.08.006>.
- Rodan, Garry. *The Political Economy of Singapore's Industrialization: National State and International Capital*. Palgrave Macmillan UK, 1989., Chapter 5;
- Hank Lim, ERIA Innovation Policy ASEAN, Innovation in Singapore; Yanfei Li, Dayong Zhang, ERIA Innovation Policy ASEAN, Innovation in China

8. Twenty-First-Century Crossroads: Degrowth, Sustainable Growth and Green Growth

Wednesday 14 January 15-17, Room 3

Topic:

- Western dilemmas: demography, slowing growth, international competition
- Competing electoral imperatives
- Different visions of the future

Primary sources (pick one):

- Hickel, Jason. *Less Is More: How Degrowth Will Save the World*. William Heinemann, 2022, Chapter 2 and chapter 3
- Klein, Ezra, and Derek Thompson. *Abundance*. Avid Reader Press, 2025, Introduction, Chapter 4 and 5
- Bastani, Aaron. *Fully Automated Luxury Communism: A Manifesto*. Verso, 2019., Chapter 2, 3, 4, 5, 12
- Latouche, Serge, and Didier Harpagès. *Il Tempo Della Decrescita. Introduzione Alla Frugalità Felice*. Elèuthera, 2017.
- *The Ecomodernist manifesto*, <https://www.ecomodernism.org/>

Literature (pick one):

- Muraca, Barbara, and Matthias Schmelzer. ‘Sustainable Degrowth: Historical Roots of the Search for Alternatives to Growth in Three Regions’. In *History of the Future of Economic Growth: Historical Roots of Current Debates on Sustainable Degrowth*, edited by Iris Borowy and Matthias Schmelzer. Routledge, Taylor & Francis Group, 2017..
- Fieldhouse, Andrew J., and Karel Mertens. ‘The Social Returns to Public R&D’. *NBER Chapters*, National Bureau of Economic Research, Inc, 2025. <https://ideas.repec.org/h/nbr/nberch/15155.html>.
- Mazzucato, Mariana. *The Entrepreneurial State: Debunking Public vs Private Sector Myths*. New edition. Penguin Publishing Group, 2024, Introduction, Chapter 1
- Mazzucato, Mariana. *The Entrepreneurial State: Debunking Public vs Private Sector Myths*. New edition. Penguin Publishing Group, 2024, Introduction, Chapter 2

- Mazzucato, Mariana. *The Entrepreneurial State: Debunking Public vs Private Sector Myths*. New edition. Penguin Publishing Group, 2024, Introduction, Chapter 6