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Global Growth Perspectives in a World of Digital Innovation and AI

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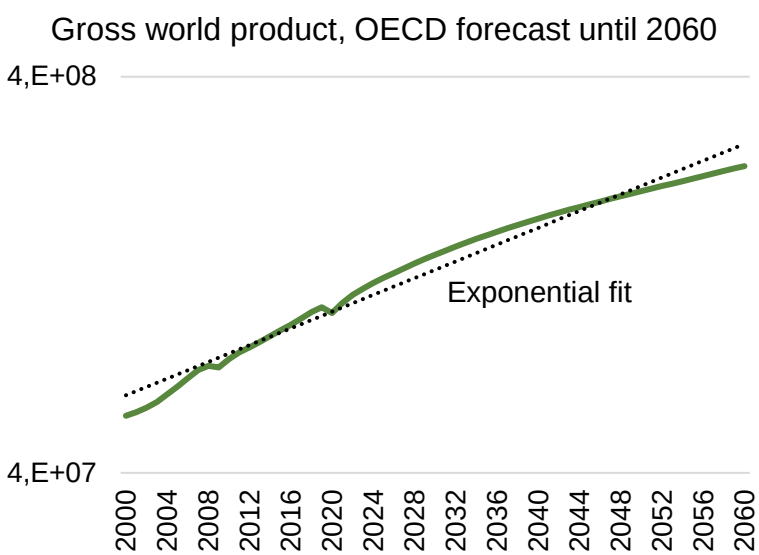
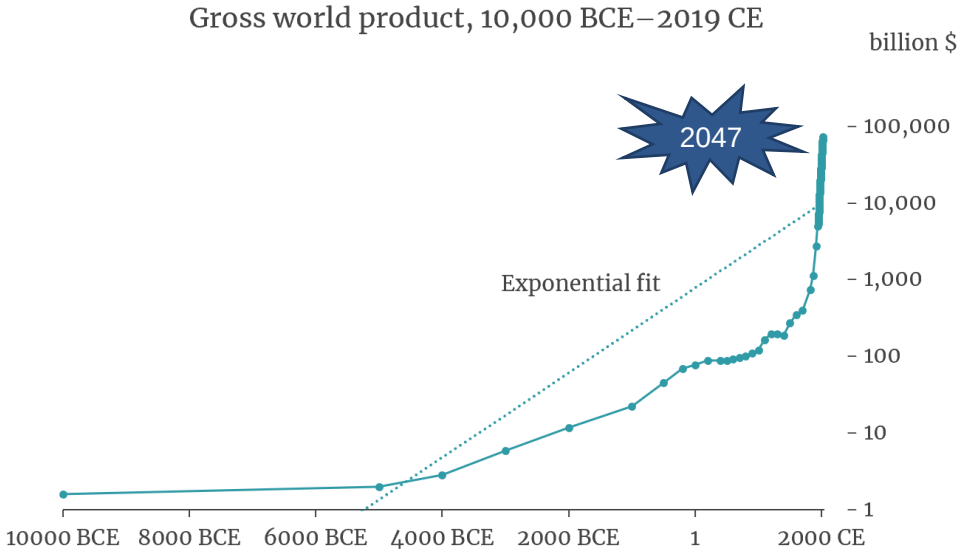
Global growth perspectives for the 21st century





OECD (2018), *GDP long-term forecast (indicator).* doi: 10.1787/d927bc18-en (Accessed on 01 September 2023)

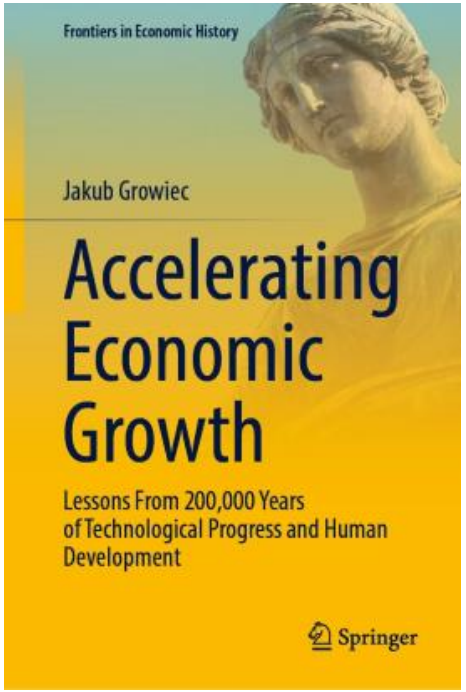
Roodman, D. (2020), *On the probability distribution of long-term changes in the growth rate of the global economy: An outside view.* Open Philanthropy.

Why are the long term forecasts so diverse?

- **Secular stagnation** (Gordon, 2016; Bloom et al., 2021; Jones, 2023)
  - Slowdown in TFP growth; bounded impact of automation
  - Slowdown in population growth
- **Growth acceleration** (Brynjolfsson et al., 2019)
  - J-curve in productivity following the Digital Revolution
  - Race against the machine – innovation vs. automation (Acemoglu and Restrepo, 2018)
  - Automation, partial vs. full; automation in R&D (Growiec, 2022)
- **Technological singularity** (Kurzweil, 2005; Roodman, 2020)
  - Superhuman artificial general intelligence (Bostrom, 2014)
  - Next technological revolutions thanks to superhuman AGI

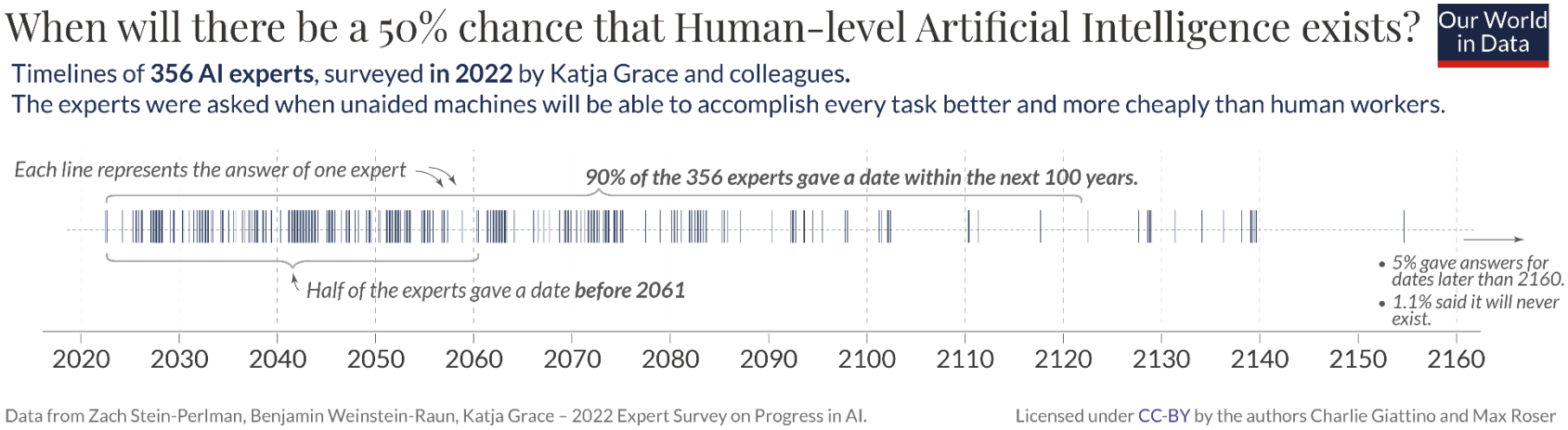
Partial vs. full automation

- **Partial automation**
  - Routine jobs get automated; complementary non-routine jobs see increased demand
  - People and machines are **complementary**
  - Human cognitive work remains the growth bottleneck
  - Long-run growth driven by labor-augmenting technical change (so far ~2-3% per annum)
- **Full automation (e.g., with AI)**
  - All jobs get automated
  - People and machines are **substitutable**
  - Long-run growth driven by the accumulation of programmable hardware (so far ~20-30% per annum)



AI timelines: how long until AGI?

- OpenAI (2023): ``While superintelligence seems far off now, we believe it could arrive this decade" (until 2030).
- Cotra (2022), based on a formal model: ~2040



Disruptions due to AGI

- **Superhuman AGI will be disruptive**
  - Allows full automation
  - Superior AI decision making leads to AI takeover
  - The **alignment problem** – will AGI benefit humanity?
  - Unaligned AGI is an **existential threat**
- **Why race towards AGI?**
  - Huge potential of advanced AI technologies (profits, power)
  - Appropriable gains, distributed losses
  - The field is unregulated and others are racing, too!
- Large language models such as GPT-4 already exhibit certain **emergent features**
  - Generality: GPT-4 solves a variety of tests very well
  - Deception, theory of mind: GPT-4 passes the Turing test