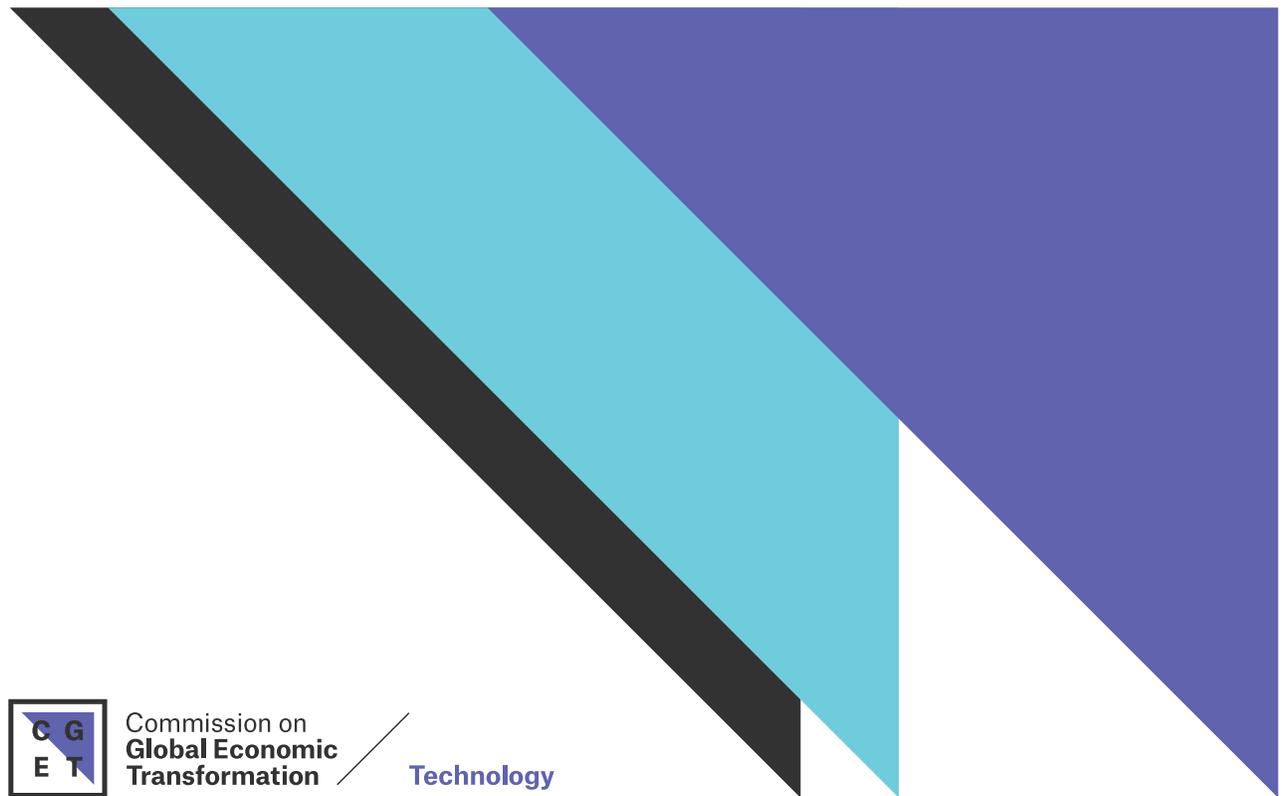


Institute for  
**New Economic Thinking**

# Technological Disruption *in the* Global Economy



Commission on  
**Global Economic  
Transformation**

**Technology**

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## Institute for New Economic Thinking

We are economists who challenge conventional wisdom and advance ideas to better serve society. Founded in the wake of the financial crisis in 2009, the Institute for New Economic Thinking (INET) is a nonpartisan, nonprofit organization devoted to developing and sharing the ideas that can repair our broken economy and create a more equal, prosperous, and just society. To meet current and future challenges, we conduct and commission research, convene forums for exchanging ideas, develop curricula, and nurture a global community of young scholars.

### **Our approach is guided by a set of key principles:**

- Economists and their ideas must be independent from powerful interests. Otherwise, economics is beholden to those at the very top and fails to serve all of society.
- Complexity and uncertainty are inherent in economic and financial systems. We must question theories based upon the flawed assumption that humans always behave rationally and predictably, and that markets always trend towards equilibrium.
- Inequality and distribution matter as much to the economy as growth and productivity.
- Heterodox models that pose alternatives to the neoclassical orthodoxy are essential to understanding the economy and promoting a vibrant intellectual pluralism.
- History matters. We must learn the lessons of past mistakes, and also draw on roads not taken historically to map a more equal and prosperous future.
- Diversity of race, gender, class, and other forms of identity enrich economic thought.
- An outdated economic structure is endangering our planet—but new approaches could save it. To uncover solutions, economists must first incorporate analyses of climate change, population growth, and stressed resources into their research.

- Multidisciplinary learning. A discipline in isolation develops harmful blind spots. We collaborate with scholars in other social sciences, the humanities, and the natural sciences to better understand our world.

### **We work with the economics community to:**

- Produce and fund innovative research.
- Develop curricula and educational resources for students.
- Support INET's Young Scholars Initiative, a global network that is nurturing the next generation of new economic thinkers.
- Host conferences where leading and emerging economists, students, and other scholars exchange and develop new research and ideas.

### **We work with influencers and policymakers to:**

- Amplify the work of our staff economists and grantees, ensuring that their findings and ideas can have real-world impact.
- Apply new economic thinking to policy questions, as with our Commission on Global Economic Transformation.
- Demystify economics for the engaged public through our blog and video content, social media channels, and events.



Commission on  
**Global Economic  
Transformation**

**Macroeconomics  
& Finance**

**Globalization**

**Technology**

**Climate**

### **About the Commission on Global Economic Transformation**

Initiated by the Institute for New Economic Thinking, the Commission on Global Economic Transformation (CGET) aims to clearly enumerate and articulate the most critical problems in the global economy. Political and economic populism recently swept the developed world. Meanwhile, developing countries are struggling to search for paths to prosperity, and people around the world are coping with the challenges posed by widening inequality, technological disruption, and climate change. These are compounded by the ineffectiveness of current policy tools, raising questions about the role of the state, civil society, along with national and international governance frameworks.

CGET will harness the energy already evident in the academic and public spheres to chart alternative reforms that will support a more sustainable, prosperous course for the world economy. CGET will also build a knowledge bank of high-quality research that will inform policymakers with evidence-based recommendations. Culminating in a final report, CGET will bring research findings and concrete guidance to bear on policy challenges—creating a bridge between meaningful research and leadership that will positively influence the transformation of the global economy.

### **CGET is led by:**



**A. Michael Spence**  
CGET Co-Chair



**Joseph Stiglitz**  
CGET Co-Chair

### **CGET Commissioners:**

Nelson Barbosa

Peter Bofinger

Mohamed El-Erian

Robert Johnson

Rohinton Medhora

Danny Quah

Eisuke Sakakibara

Beatrice Weder  
di Mauro

Kaushik Basu

Winnie Byanyima

Gaël Giraud

James Manyika

Mari Pangestu

Dani Rodrik

Adair Turner

Yu Yongding



Commission on  
**Global Economic  
Transformation**

**Technology**

### **Inequality, Technology, and the Future of Work (Technology)**

The themes of inequality, technology, and the future of work stand out as existing institutions struggle to cope with emergent forces in the economy. New advancements in robotics, artificial intelligence, and computing occupy news headlines, however these developments have arguably yet to penetrate the economy as a whole. While technological advancements promise to strengthen business performance and economic growth—and if harnessed properly could help mitigate looming crises like climate change—they are also creating a challenge to employment. Some jobs done by humans might soon be taken over by robots, some jobs will change as they are complimented by technology, and new occupations will arise altogether. These changes to work—including jobs lost or transformed, the shifting mix of occupations, and changes in work location—are likely to lead to significant workforce transitions in terms of education, skills, and wages. Furthermore, conventional theories struggle to accommodate new digital platforms, the fast-changing nature of competition, market structure, data privacy, and intellectual property rights—as well as questions of bias, transparency, and accountability—when it comes to the use of data and algorithms. All of these transformations are happening against the backdrop of worsening income and wealth inequality, which undermines social cohesion, shared prosperity, and democracy itself.

### **When and Where:**

Wednesday, February 6<sup>th</sup>, 2019  
San Francisco, CA

### **The Chatham House Rule**

To create an open environment for debate and discussion, the participants attended under Chatham House Rule.

Accordingly, the ideas discussed in this report reveal neither the identity nor the affiliation of the speakers, nor that of any other participant except where explicitly attributed.

**Attended by:**



**A. Michael Spence**  
CGET Co-Chair,  
New York University



**Nelson Barbosa**  
Commissioner,  
University of Brasilia



**Peter Bofinger**  
Commissioner,  
German Council of  
Economic Experts



**Robert Johnson**  
Commissioner,  
INET President



**James Manyika**  
Commissioner,  
McKinsey  
Global Institute



**Anat Admati**  
Stanford University



**Susan Athey**  
Stanford University



**Hans Peter Brøndmo**  
(Google) X



**Erik Brynjolfsson**  
MIT



**Jonathan Hall**  
Uber



**Gordon Hanson**  
UC San Diego



**Jennifer Harris**  
William and Flora  
Hewlett Foundation



**Jaron Lanier**  
Microsoft



**John Mallery**  
MIT



**Carmen Rojas**  
The Worker's Lab



**Richard Samans**  
World Economic  
Forum



**Laura Tyson**  
UC Berkeley



**John Zysman**  
UC Berkeley



**Ginger Jin**  
Amazon



**Damon Silvers**  
AFL-CIO



**Shivani Nayyar**  
UN Development  
Programme



**Nicholas Ashford**  
MIT



**Nicholas Johnson**  
Applico



**Pia Malaney**  
INET



**Natalie Foster**  
Economic Security  
Project



**Jack Gao**  
INET



**Hugo Zsolt de Sousa**  
INET

## Introduction

Technology has become the most powerful disruptive force in our economy. It bears on the future of work, competition, market power, and national security, and it binds the other major areas of our commission's investigation: macroeconomics and finance, globalization, and climate change. In essence, technological progress propels global economic transformation.

Our gathering on February 6, 2019 brought economists together with leading voices from academia, labor, private industry, and the nonprofit/NGO sector. We heard from industry leaders with deep roots and history in the Silicon Valley technology revolution, academics who have also spent time in the policy arena, and from individuals who are already considering new models and approaches to digital rights and the future of work. Our discussion was by no means exhaustive or conclusive, but we attempted to harness the group's collective wisdom to address some of the most vexing questions of our day.

This document is intended to inform our commissioners as they develop CGET's final report and to share our timely conversation with policymakers and the general public. Fomenting multidisciplinary, critical discourse is one of the most important responsibilities of this initiative, and we sincerely thank the staff at the Institute for New Economic Thinking (INET), our dedicated commissioners, and our outside thought leaders for helping us to promote this dialogue.

Sincerely,



**Robert Johnson**  
President,  
Institute for New Economic Thinking



**Michael Spence**  
CGET Co-Chair

## Executive Summary

“Not long ago, digital technology was viewed mainly as a sector with perhaps a small claim as a general-purpose technology. But now it is viewed as a key part of the infrastructure of the whole economy. Or to put it differently, the digital economy is becoming the entire economy.”

### A. Michael Spence

CGET Co-Chair

- **The relentless focus on growth**, the failure of traditional metrics such as GDP to represent technological progress, and the disproportionate reallocation of value from labor to capital collectively increase the social cost of work and misalign priorities in our society.
- Technology may have helped bring us closer to solving society’s most pressing challenges, but the responsibility for identifying and implementing solutions remains within our institutions, organizations, and leadership. **We need to reimagine what constitutes time and resources well spent while defining a deliberate and responsible use of technology.**
- **Data is an asset, and it matters who has control over it.** We need to rethink how the value of data is accounted and distributed, including but not limited to potentially paying individuals for their data, expanding rights of digital citizenship in the 21<sup>st</sup> century, and creating social insurance contracts.
- **Tinkering or minor fixes will not work.** “Civic moonshots”—ways to radically rethink our economy in the context of technology—are needed.
- The current wave of technological transformation has arrived during a political economy regime of the labor market that does not equitably distribute gains from productivity increases. Changes in labor markets—from the growth of the gig economy to workplace fissuring and outsourcing—are transferring risks from corporations to individuals and families, creating economic insecurity. **While digital platforms can sometimes reduce the matching cost and market friction, they have shifted bargaining power away from labor.**
- The potential for monopolistic behavior varies across digital platforms and online marketplaces. **Traditional economic tools are not always sufficient to deal with economies of scale, monopolies on user attention and data, and other anti-competitive behaviors inherent in today’s technology platforms.**
- **The fault line of globalization is shifting quickly into the technology sphere, where there is no clear boundary between commercial and national security concerns.** Dual use technologies make it even harder to think about issues of competition and IP protection. Nonetheless, it is important to distinguish genuine self-determined national development strategies and beggar-thy-neighbor policies.

# Technological Changes and the Evolving Structure of the Economy.

Any discussion of economic growth, productivity, the future of income and prosperity, the future of work, the global value chain, growth patterns for developing countries, competition, or market power quickly becomes a conversation related to technology. Technology is becoming the underlying core of the economy rather than a single layer.

Work will be radically different in the future, and our existing institutions are not helping us make the necessary transition. Current models of work are directing value disproportionately from labor to capital, and the relentless focus on economic growth and cost reduction are creating perverse social incentives. The social costs of existing work arrangements are high, and they generate significant negative impact on families and social wellbeing, exacerbating inequality of income and opportunities societies already experience. All of these points underscore how the working world will radically evolve in the coming years and the need to reimagine the nature of work.

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## Artificial Intelligence

A set of techniques used to try to imitate human intelligence.

### Machine Learning

Using large amounts of data, machines learn without being explicitly programmed.

### Deep Learning

A type of machine learning that uses deep neural networks.

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Robots and artificial intelligence (AI) are coming at us. These technologies are increasingly deployed in workplaces and factories, as well as our homes; and they are changing the way we live, work, learn, and play. Just as mainframe computers became personal computers and evolved into

smart phones, so the current age of industrial robots may soon give way to the age of personal robotics. If we are moving from automation to autonomous machines, the possible future transition from “autonomy” to “agency” will hinge upon the choices society makes today.

Instead of focusing on the role technology plays, perhaps we should focus on how to deploy existing technologies in a deliberate and responsible manner. **Here we may need something of a “civic moonshot” that helps us reimagine our institutions, culture, financial models, and models for democracy. System problems cannot be solved with “duct tapes and scaffolding”—they require big and bold thinking.**

While we will certainly need to embrace more technology in the future, if not rely upon technology to help solve society’s problems, we must concentrate our efforts on the “human” aspects. The Gross Domestic Product (GDP)—a great 20<sup>th</sup> century invention to measure economic activity — is poorly suited for today’s economy. It excludes digital goods produced at zero marginal cost and lends itself to mismeasurement of productivity. New efforts are underway to document detailed workforce implications from technology, including the Suitability for Machine Learning initiative at MIT. Yet much more will be needed to understand the impact of technology and prepare our institutions and organizations for its wider and deeper application.

Data occupies a central role in this round of technological revolution. It not only generates economic return for individuals but also creates value in larger ways. Many business models rely on the collection of individual data. The use and treatment of such data and platform firms’ near monopoly on user attention exacerbate “fake news” and privacy issues. Some proposals argue for paying individuals outright for their data; others advocate for expanding “digital citizenship” to make services such as banking free; still others espouse a different kind of “social insurance” that responds to emerging insecurities and uncertainties in the labor market. These approaches seek to correct the existing economic model that directs value from capital to labor and shifts risk from corporations to individuals.

# Efficiency, Equity, and Inclusiveness in Labor Markets in the Age of AI.

While both globalization and technology contribute to stress in the labor market, technology has had a distinct and larger impact. The labor market differs from other markets in fundamental ways, and its structure determines whether an economy is politically, socially, or ecologically sustainable. Two critical questions that confront the labor market today are the availability of work amid the revolutionary capacity of artificial intelligence and the distribution of wealth and income across factors of production. There may be enough jobs for us in the future, but the nature of jobs, the wages they pay, and the skills they require will be vastly different from today.

A historical review of productivity gains informs our understanding of today’s labor market. The discussion below focuses on the decoupling of labor productivity and hourly compensation in the US beginning in 1948.

Four features characterize the regime in the period when income growth tracked labor productivity closely: 1) the dominance of collective bargaining in the US labor market before the 1980s; 2) the movement of minimum wage that grew in tandem with productivity and inflation; 3) a robust antitrust enforcement system, policies designed to support small and medium enterprises, and the Federal Reserve’s regulation of the banking system that channeled credit toward “Main Street,” and 4) a federal government that encouraged full employment. These features effectively ceased in the early 1980s.

The current wave of technological transformation has arrived amid a political and economic regime that does not equitably distribute the gains from productivity

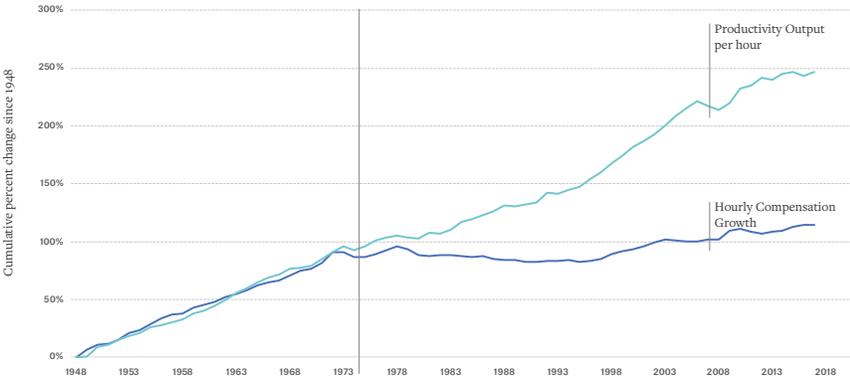
increases. Both skilled and unskilled workers are feeling economic and political disempowerment, as manifested by the recent teachers’ strikes, Marriott strike, and Google strike in the U.S. Technology certainly does not equal injustice, but it aggravates the problems plaguing today’s workers. To contend with emerging wealth-generating technology, decision makers must implement public policies that promote social solidarity and sustainable wealth distribution. Policymakers must collaborate with workers to craft policies addressing workforce retraining, wage and income inequality, and labor market mobility.

“The technological transformation today is arriving into a political economy regime that is pre-structured to not distribute the gains of productivity.”

Damon Silvers

New technology also gave rise to the gig economy and the market for on-demand services. These markets have seen increased concentration, and regulators must revisit and address anticompetitive behavior. At the same time, technology improves worker-job matching and reduces friction in some markets by improving efficiency and reducing switching costs. Because workers in these new markets have limited benefits and lack job security, policymakers must also consider workers’ overall welfare.

**U.S. Productivity and Hourly Compensation (1973=100)**



Change 1973–2017:

**Productivity**  
**+77.0%**

**Hourly pay**  
**+12.4%**

Productivity has grown 6.2x more than pay

Source: Economic Policy Institute

# Development Patterns and Inclusive Growth.

While GDP may matter a lot for economic observers and financial markets, it does not necessarily reflect living standards. If the topline indicator is the growth of economic output, then the median household living standard can be thought of as the bottom line. For the last half century, GDP has framed the thinking of policymakers and economists. Studies of GDP and its drivers must be balanced with an investigation of living standards.

Before the advent of GDP, classical economists researched how market activity diffused benefits to the broader society without considering median living standards. While today's economists attempt to measure

well-being by calculating the median living standard, many important factors are overlooked, including: economic opportunity, employment, income and purchasing power, economic security, and additional quality-of-life indicators. Institutions, policy incentives, institutional capacity, and infrastructure in the economy shape these inputs. The Inclusive Growth and Development framework at the World Economic Forum is one such attempt to more accurately measure the relationship of growth to quality of life. The impending wave of automation requires us to continue to rethink our institutions in a multi-varied fashion.

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“Economists (and other high-skilled labor) could be tomorrow’s Uber drivers.”

Jaron Lanier

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# Digital Platforms, “Superstar” Firms, and Market Power.

## Superstar dynamics, seen among firms, are also seen in sectors and cities

Source: McKinsey Global Institute

10%

of companies  
make up

80%

of economic profit  
among large, global  
firms and their  
average profit is  
increasing.

1%

of companies  
make up

36%

of economic profit  
among large, global  
firms and their  
average profit is  
increasing.

20%

of sectors  
account for

70%

of global private-  
sector gains in gross  
value added and  
gross surplus.

1.6%

of cities worldwide  
account for

30%

of global GDP and  
are becoming more  
prosperous than  
peers over time.

The notion of superstar firms can be nebulous, but the following factors help distinguish such firms from their industry peers: the reliance on information technology, data-driven business models, and the presence of network effects. Firms with an outsized influence in the industry and economy have emerged in technology and data-heavy sectors, as well as in traditional non-tech sectors.

The superstar effect—one single or a handful of players claiming an outsized share in a market—exists across firms, sectors, and cities. The McKinsey Global Institute surveyed the world’s entire private sector gross output of \$27.2 trillion and documented superstar effects. The study found that firms in the top 10% captured 80% of the available profit pool, or \$1.4 billion—an increase from 20 years ago. Firms in the top 1% captured 36% of profit, which also rose over the last two decades. Firms in the bottom decile destroyed more value than the top 10% created. Firms in the finance, real estate, business services, tech, and pharma sectors captured 70% of global economic gains. Superstar sectors have grown notably less capital- and labor-intensive in the past 20 years.

Observers disagree about whether tech giants such as Alibaba, Amazon, Facebook, and Google form a separate digital economy or whether their early adoption of new technologies has simply given them a competitive edge. While these giants have perhaps increased competition in some traditional industries, they may also have created new markets and maintained market power in the process, thereby increasing industry concentration.

Some economists studying the tech industry find that economies of scale among today’s superstar firms are real and sometimes very large. For example, search engines enjoy economies of scale in data. They invest heavily in R&D and are pioneers of big data and AI applications. They can harm other companies by denying startups or advertisers access to user data and information, and by redirecting traffic to their own services in otherwise competitive markets. This novel combination of forces raises concerns about social welfare, particularly within downstream industries, which are home to some of today’s most innovative firms.

Finally, we should consider the following three realities in this age of superstars. First, platform companies differ in their impact on industry competitiveness, depending on the number of platforms in an industry and a platform’s business stake downstream. These factors influence the suitable regulatory approach for each industry. Second, **we must address how increased market efficiency can diverge from social welfare improvements.** For example, ride sharing platforms have caused the value of taxi drivers’ medallions to plummet, and gig economy workers typically lack traditional benefits. Third, when the private sector does not have the incentive to tackle the negative consequences of disruption, public and philanthropic efforts are needed to protect workers and society.

# Technology, Globalization, and Great Power Rivalry.

Technology compounds the existing challenges of globalization. In much of the technology space, dual use technologies—those suited for both commercial purposes and national security applications—have emerged. Nations do not always agree on the definition and scope of these technologies or on the appropriate regulation and policies to apply to them.

Today, economic development and competitiveness questions are easily confused with national security and geopolitical issues. Nations have a right to pursue economic and commercial objectives through national policies, trade, and investment. However, geopolitical rivalry may create a zero-sum game necessitating action. Disputes between the U.S. and China are often grounded in national security concerns about technology rather than economic wellbeing. The U.S. should work with allies

through existing international institutions and pursue tighter restrictions on inbound investment and exports.

As to international security and cyber security, a number of challenges are confronting the international community. These include: 1) great powers jockeying with each other for competitive advantage to the point of outright conflict; 2) military cyber instability related to informatization and AI; 3) the fragmentation of international trade, specifically in information and communication technology products; and 4) intellectual property transfer and unfair trade practices among trading partners. A modern version of the World Trade Organization (WTO) Information Technology Agreement could mitigate these challenges by addressing current practices, private sector vulnerabilities, and flawed architectures.

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The Commission on Global Economic Transformation (CGET) is a project of the Institute for New Economic Thinking.

For more information, please visit [ineteconomics.org](http://ineteconomics.org) or email [globalcommission@ineteconomics.org](mailto:globalcommission@ineteconomics.org)

