

Why Information Grows: The Evolution of **Order, from Atoms to Economies**

By Cesar Hidalgo



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What is economic growth? And why, historically, has it occurred in only a few places? Previous efforts to answer these questions have focused on institutions, geography, finances, and psychology. But according to MIT's antidisciplinarian César Hidalgo, understanding the nature of economic growth demands transcending the social sciences and including the natural sciences of information, networks, and complexity. To understand the growth of economies, Hidalgo argues, we first need to understand the growth of order.

At first glance, the universe seems hostile to order. Thermodynamics dictates that over time, order--or information--will disappear. Whispers vanish in the wind just like the beauty of swirling cigarette smoke collapses into disorderly clouds. But thermodynamics also has loopholes that promote the growth of information in pockets. Our cities are pockets where information grows, but they are not all the same. For every Silicon Valley, Tokyo, and Paris, there are dozens of places with economies that accomplish little more than pulling rocks off the ground. So, why does the US economy outstrip Brazil's, and Brazil's that of Chad? Why did the technology corridor along Boston's Route 128 languish while Silicon Valley blossomed? In each case, the key is how people, firms, and the networks they form make use of information.

Seen from Hidalgo's vantage, economies become distributed computers, made of networks of people, and the problem of economic development becomes the problem of making these computers more powerful. By uncovering the mechanisms that enable the growth of information in nature and society, Why Information Grows lays bear the origins of physical order and economic growth. Situated at the nexus of information theory, physics, sociology, and economics, this book propounds a new theory of how economies can do, not just more, but more interesting things.

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Editorial Review

Review

Finalist for the 2015 Hayek Book and Lecture Prize

"The concept of information is necessary to make sense of anything that is not a boring featureless mass, including life, mind, society, and value. *Why Information Grows* lucidly explains the foundations of this essential concept, while creatively applying it in exciting new ways. It is filled with interesting ideas, and a pleasure to read."

--Steven Pinker, Johnstone Professor of Psychology, Harvard University, and author of *The Language Instinct* and *How the Mind Works*

"Mr Hidalgo succeeds brilliantly in bringing his complex subject to life. His book is full of nuggets, from memorable phrases to interesting metaphors."

-- Economist

"Written in an accessible and entertaining style.... Hidalgo has made a bold attempt to synthesise a large body of cutting-edge work into a readable, slender volume. This is the future of growth theory and his thought-provoking book deserves to be widely read."

--Financial Times

"Contains some innovative thinking about what drives growth that could help us to navigate the turbulence of the ever more interconnected global economy."

--Nature

"Thought-provoking...Well written and accessible, the book is full of interesting ideas that deserve to be read and discussed."

--CHOICE

"An impassioned argument for the advantages of an information-centric view of economic growth, and for understanding the different capacities of nations to provide solutions to human problems... Hidalgo persuasively demonstrates the value of this approach by placing the ideas firmly in their historical context, both in information theory and in physics... Hidalgo's perspective on economic wealth is wildly fresh and creative. Physicists will enjoy reading about familiar ideas in new ways, and will also find value in learning how these ideas can be applied fruitfully in areas seemingly far away from physics. Economists and other social scientists will find new concepts ripe for profitable use."

--Physics World

"Anybody interested in the future of mathematical theory in economics should read Cesar Hidalgo's book *Why Information Grows*. There are many things to like about this lucid account of the evolution of our scientific understanding of information. One of the most important may be the simplest. It illustrates what it means to think like a physicist."

-- Paul Romer, founding director of the Urbanization Project at NYU Stern

"A mind-stretching, unconventional book that draws on information theory, physics, sociology and economics to explain economic growth and why it occurs in some places, not all."

--Pittsburgh Tribune-Review

~b~>"Hidalgo invites us to understand the economy in an entirely different way.... [A] novel, holistic take on the dismal science."

--Kirkus Reviews

- "Why Information Grows shows us how humans infuse information into matter, making it more valuable than gold. Hidalgo's work brilliantly spotlights the true alchemy of the twenty-first century and its impact from economic complexity to national competitiveness."
- --Albert-Laszlo Barabasi, Distinguished Professor and Director of Northeastern University's Center for Complex Network Research, and author of Linked

"Economies are built out of information. This has been true from the Stone Age to our knowledge economy today. Yet until Cesar Hidalgo's breakthrough book, we have not had a deep account as to how and why this is so. This exciting, important book is a major step toward a twenty-first century theory of growth."

--Eric Beinhocker, Executive Director, Institute for New Economic Thinking, University of Oxford and author of *The Origin of Wealth* span

About the Author

Cesar Hidalgo leads the Macro Connections group at the MIT Media Lab. He lives in Cambridge Massachusetts with his wife Anna and their daughter Iris.

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Jennifer Bell:

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