



Understanding Economic and Social Macro Waves

ANTICIPATION, AGENCY AND COMPLEXITY

Workshop in Trento, 6-8 April 2017

The UNESCO Chairs in Anticipatory Systems on Friday 7th

Futures research over 20 years...



- Professor at Finland Futures Research Centre
- Professor in Turku Complex Systems Institute
- Unesco chair in learning society and futures of education

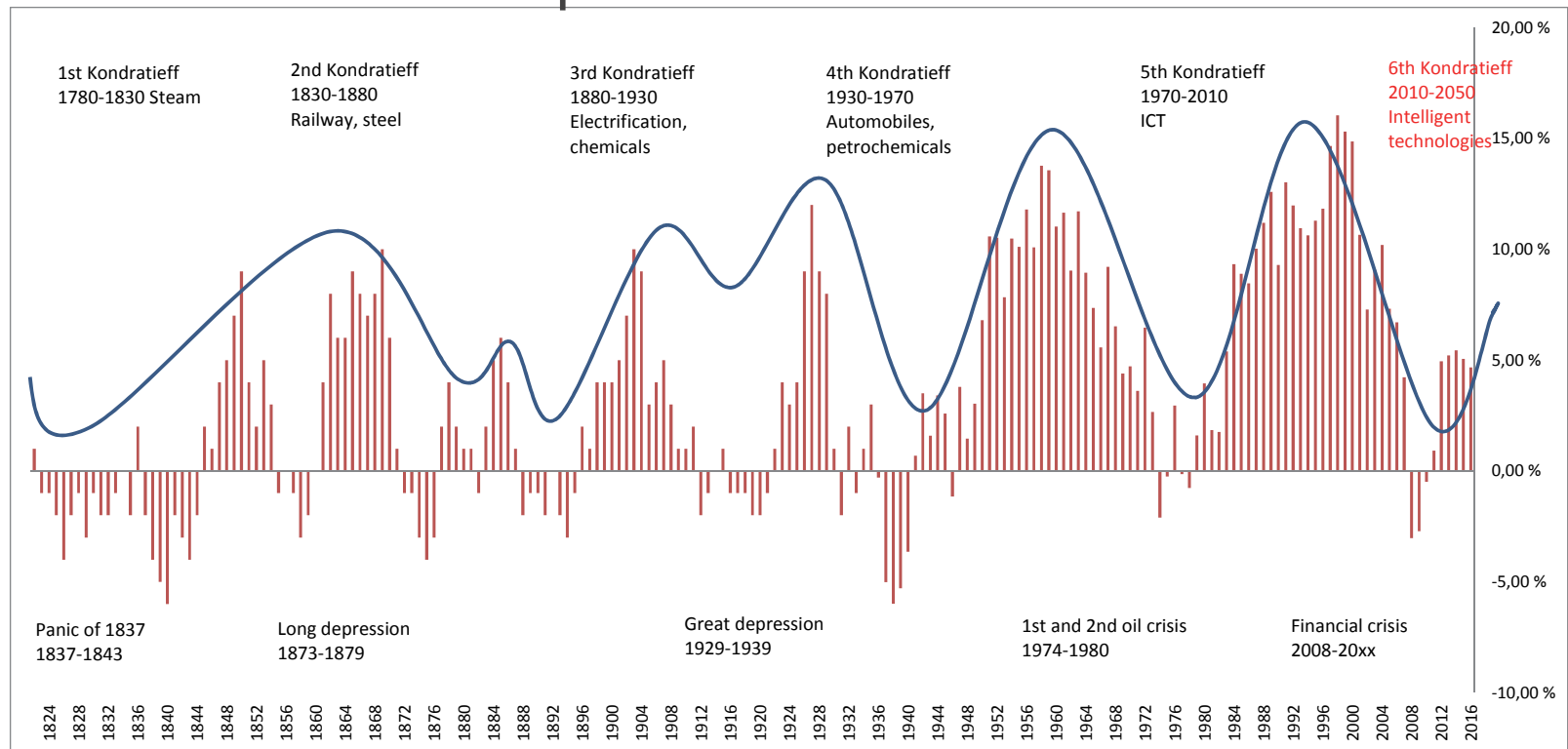
- Senior Vice President/head of strategic research at Allianz SE / Munich, Germany from Dec 2007 to Nov 2009

- President of two foundations
- Partner in several start-up companies
- Member of the Club of Rome

- Books, articles, interviews, TV-programs...

Our question: how this pattern is helpful for anticipating future?

K-Wave pattern over industrial times



Rolling 10-year return on the S&P 500 since January 1814 till December 2016 (In %p.a.). Source Datastream, Bloomberg, Helsinki Capital partners (illustration), Markku Wilenius

Scenario

1) Why waves?

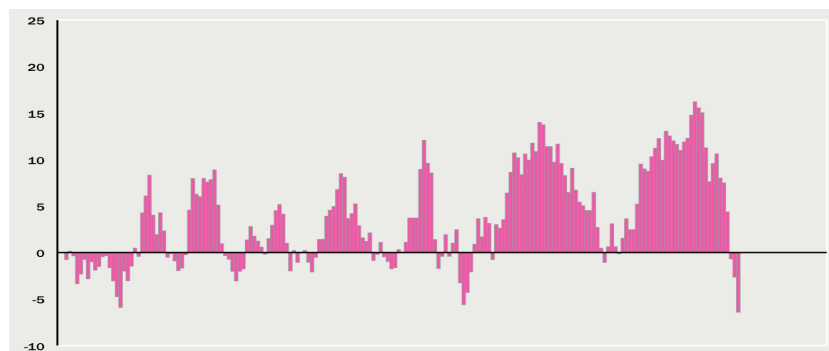


2) What is the next
wave?



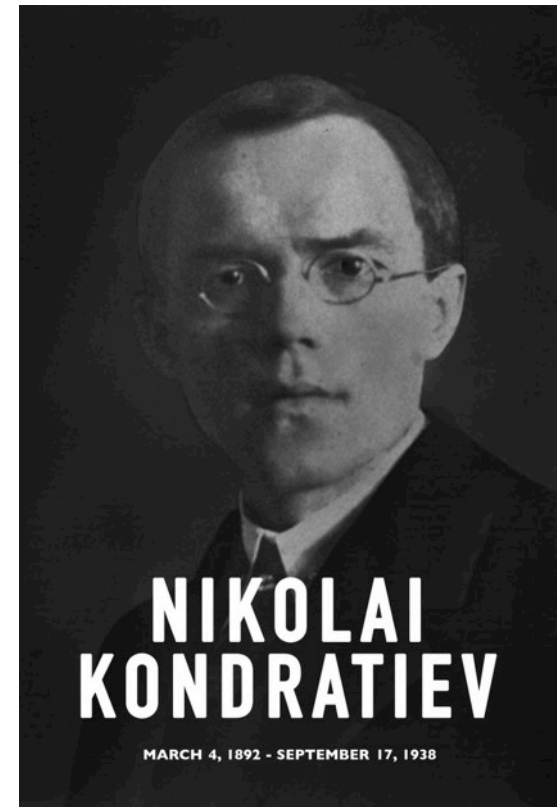
3) My 12 thesis about
anticipation

1) The waves

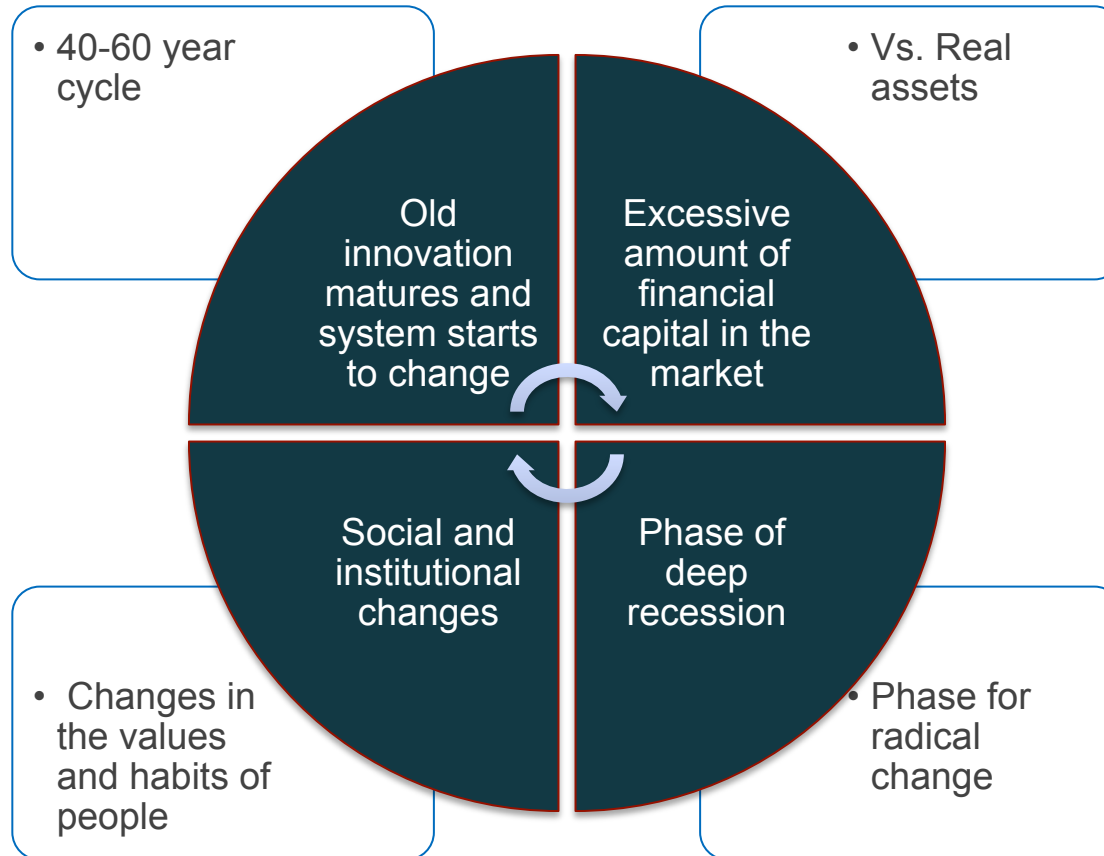


Long wave theory origins

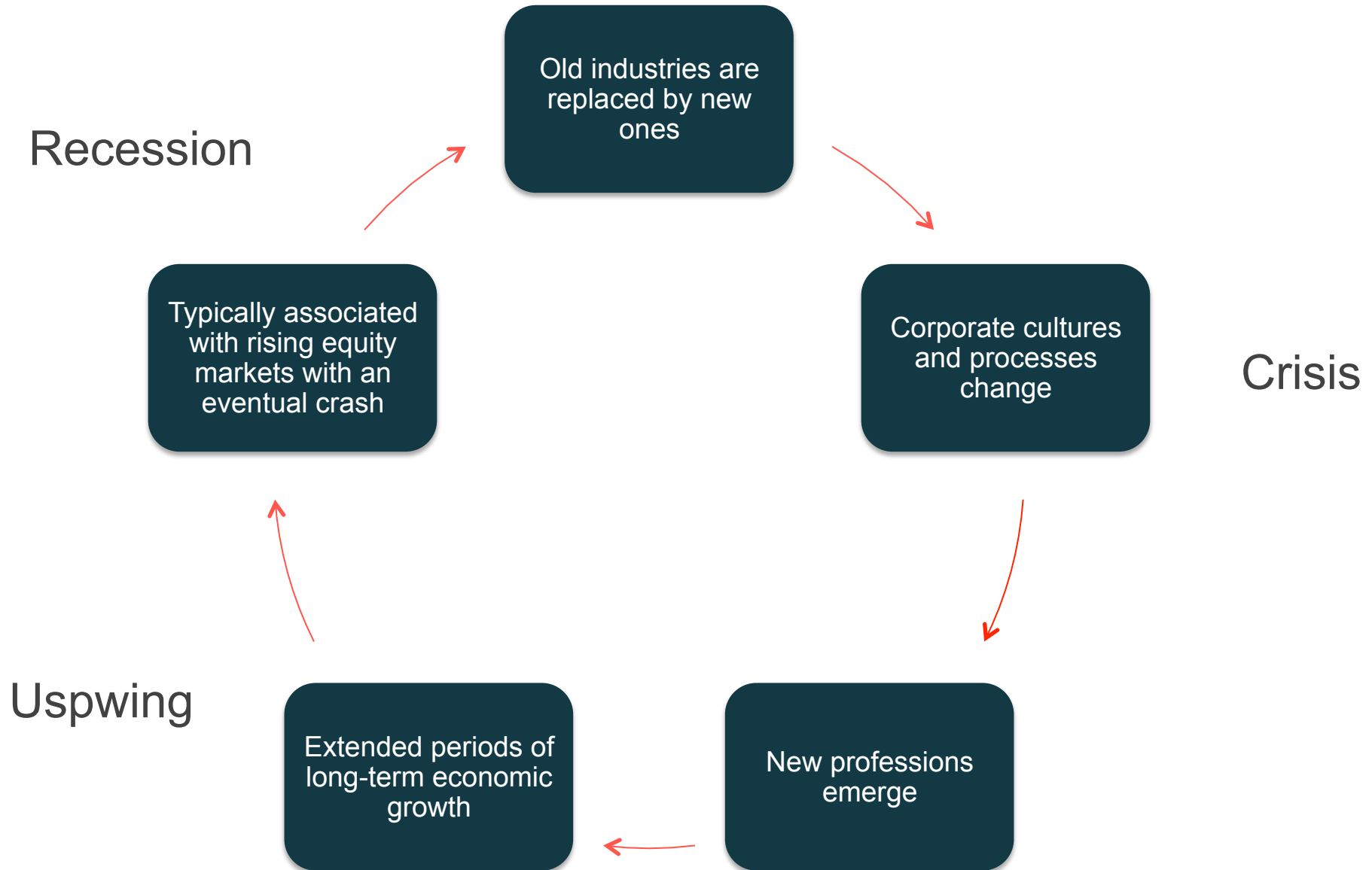
- First invented by a Russian economist Nikolai Kondratieff in early 20th century
- Later contributed by Schumpeter and others
- How to understand change and transition?



The key components



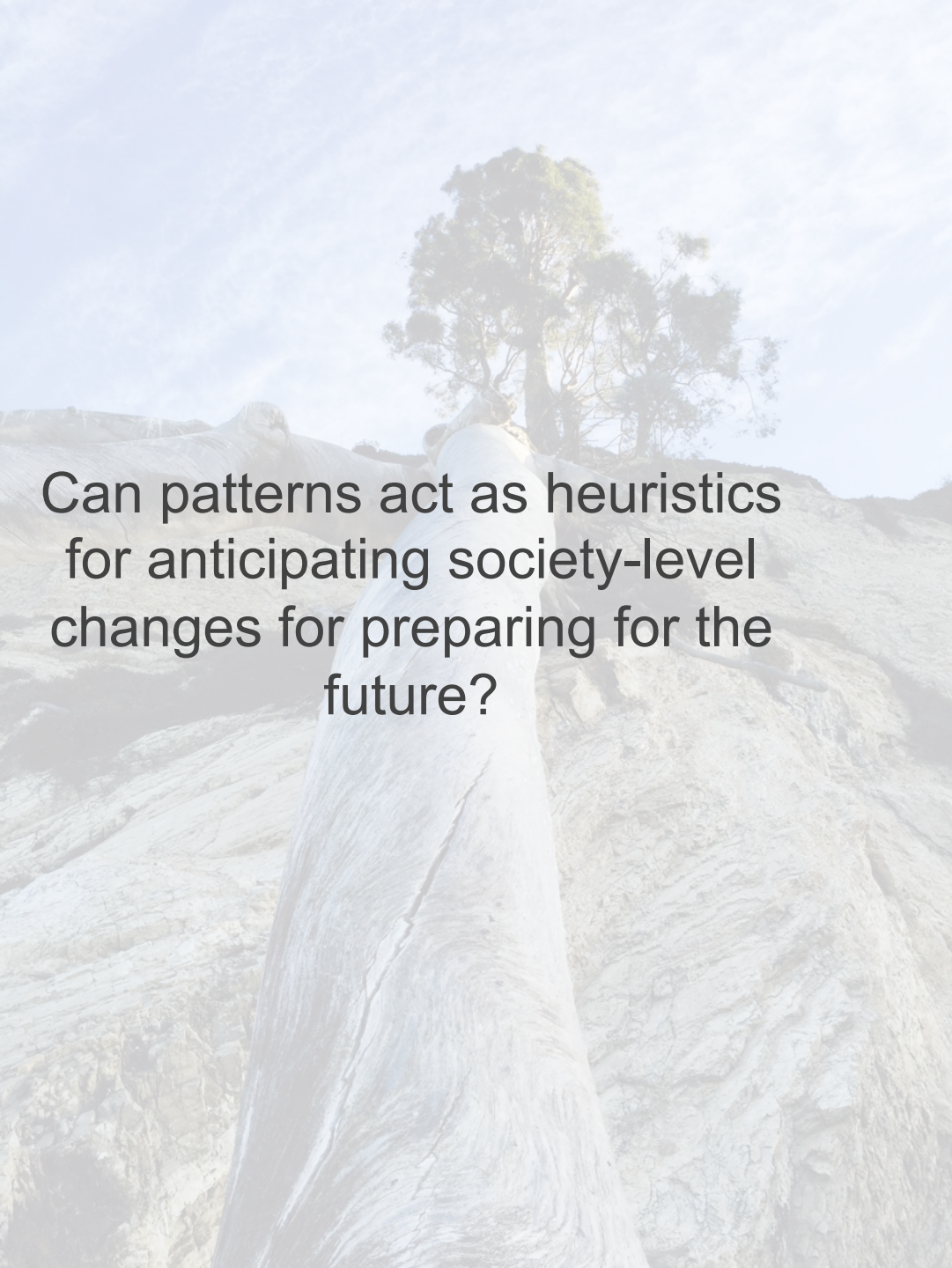
...that act in phases...



In long wave theory we...

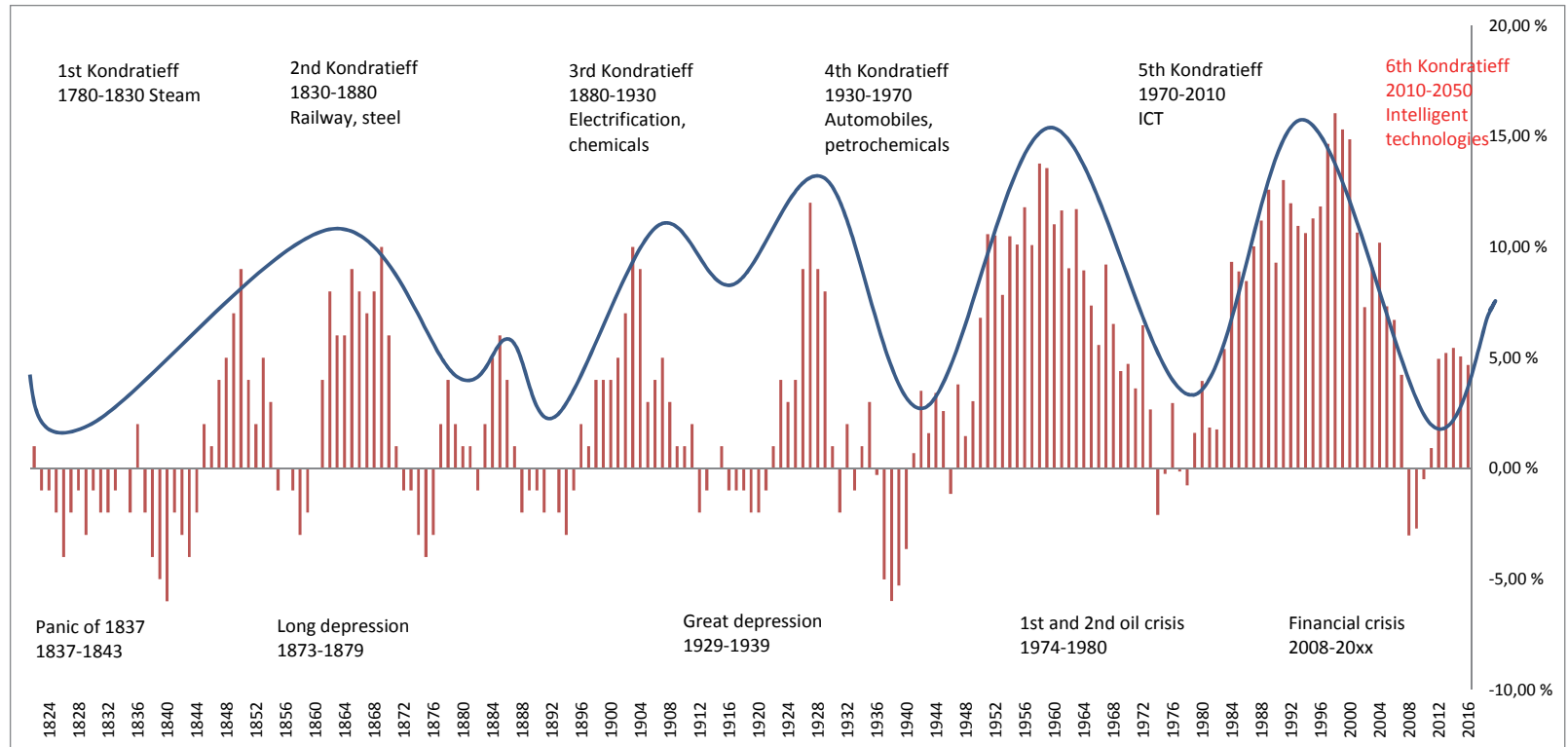
- are concerned of the whole instead of breaking components into pieces
- are more focused on the process rather than on the content
- are more interested about underlying dynamics than symptoms
- are more concerned with underlying patterns rather than identifying individual phenomenon
- are interested in patterns that explain the chaos rather than try to control chaos to enable order
- are more attentive to interaction than contents of communication

...build on systems thinking



Can patterns act as heuristics
for anticipating society-level
changes for preparing for the
future?

K-Wave pattern over industrial times

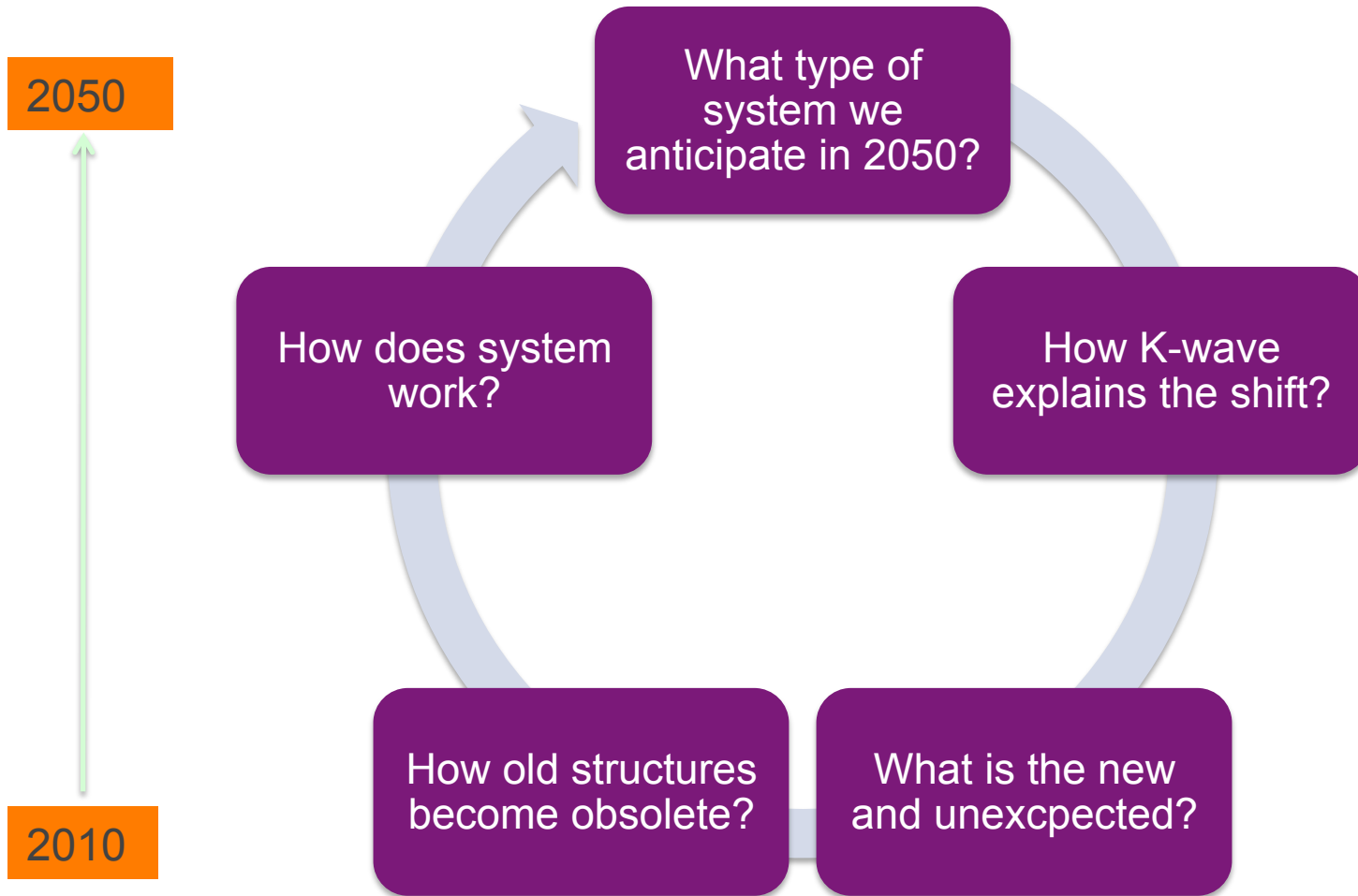


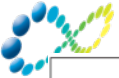
Rolling 10-year return on the S&P 500 since January 1814 till December 2016 (In %p.a.). Source Datastream, Bloomberg, Helsinki Capital partners (illustration), Markku Wilenius

THE SUCCESSION OF DEVELOPMENT WAVES IN INDUSTRIAL SOCIETIES

| K-Waves | 1st wave | 2nd wave | 3rd wave | 4th wave | 5th wave | 6th wave |
|---------------------------------------|---------------------------------------|--|--|--|--|--|
| Period | 1780– 1830 | 1830– 1880 | 1880– 1930 | 1930– 1970 | 1970– 2010 | 2010– 2050 |
| Drivers | Steam Machine | Railroad Steel | Electric- ity Chemi- cals | Automo- biles, Petro- chemi- cals | Digital commu- nication technol- ogies | Intel- ligent, resource efficient technolo- gies |
| Prime field of applica- tion | Clothing industry and energy | Trans- port, infra- structure and cities | Utilities and mass- produc- tion | Personal mobil- ity and freight trans- port | Personal comput- ers and mobile phones | Materi- als and energy produc- tion and distribu- tion |
| Human interest | New means for de- cent life | Reaching out and upwards | Building mainte- nance | Allowing for free- dom | Creating new space | Inte- grating human, nature and tech- nology |

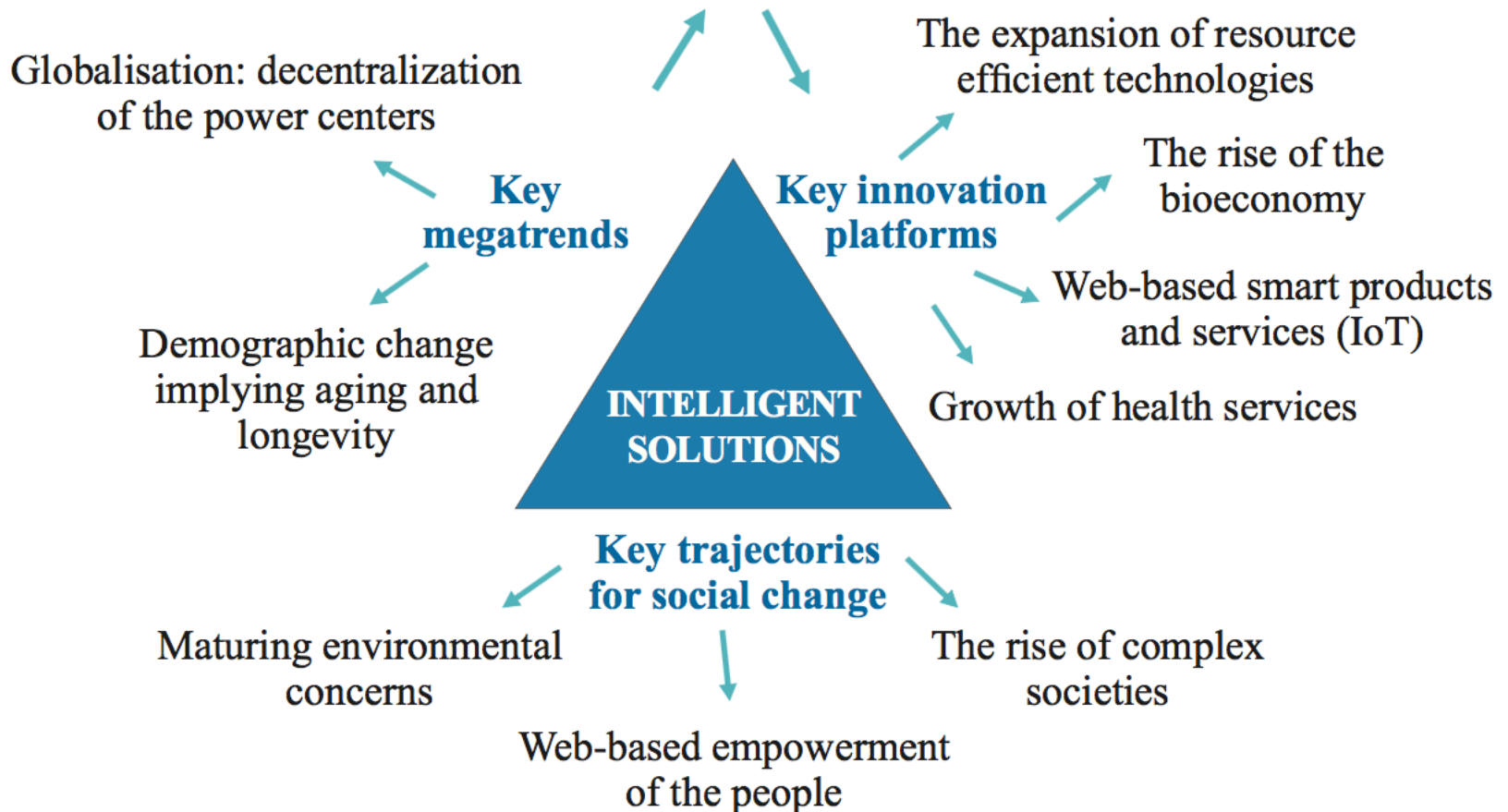
Our key questions



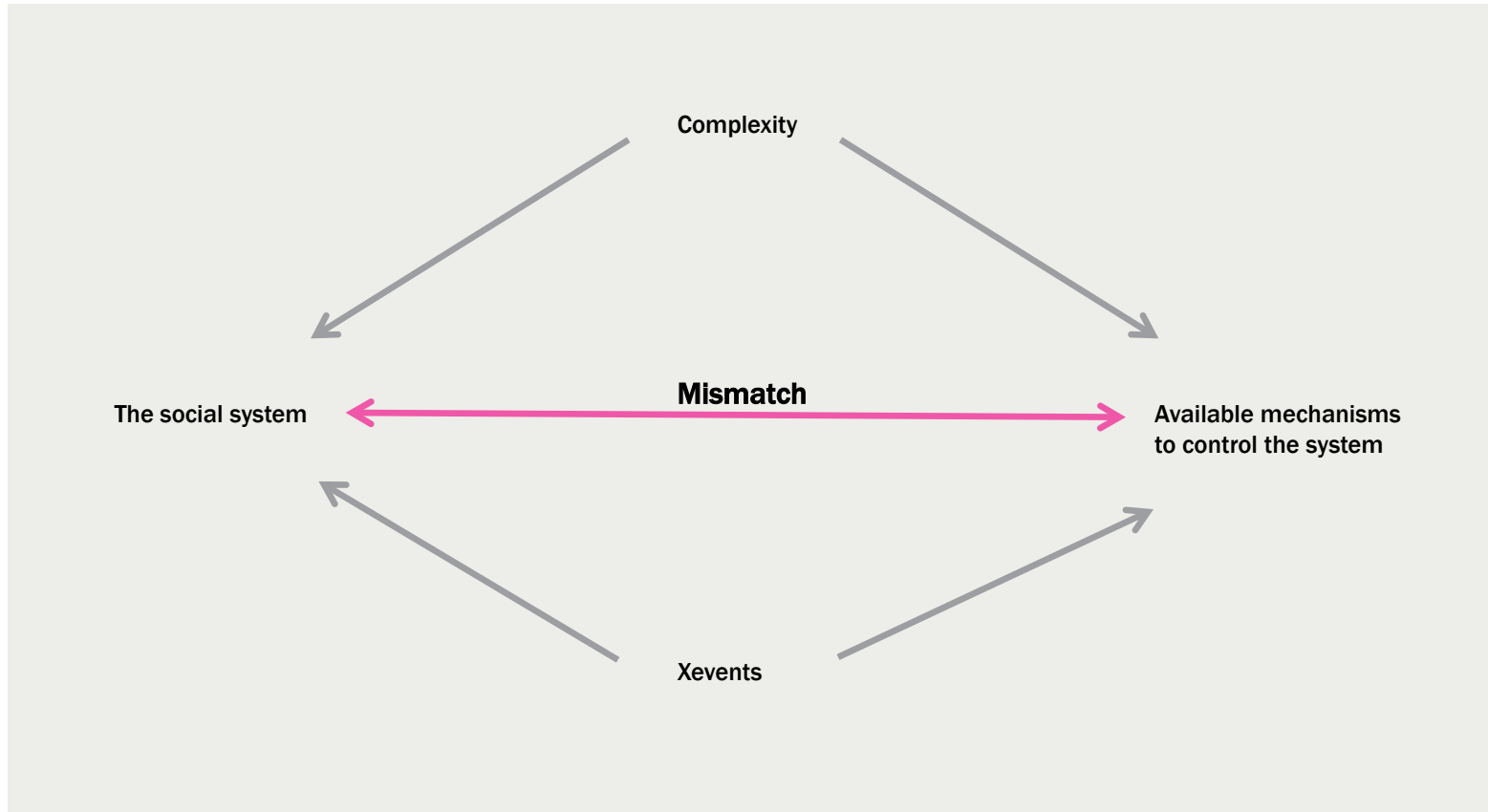


THE DRIVERS BEHIND 6TH WAVE (2010–2050)

**The search for resource productivity
and human focused solutions**



The level of complexity defines response



Example: changes in working life

Know-how in individual companies and processes

Smaller production teams

More complex work profiles/
environment

Defined tasks disappear as content of the work changes rapidly

Needed: new modes of organization

Simultaneous fast learning and dismantling of old learning

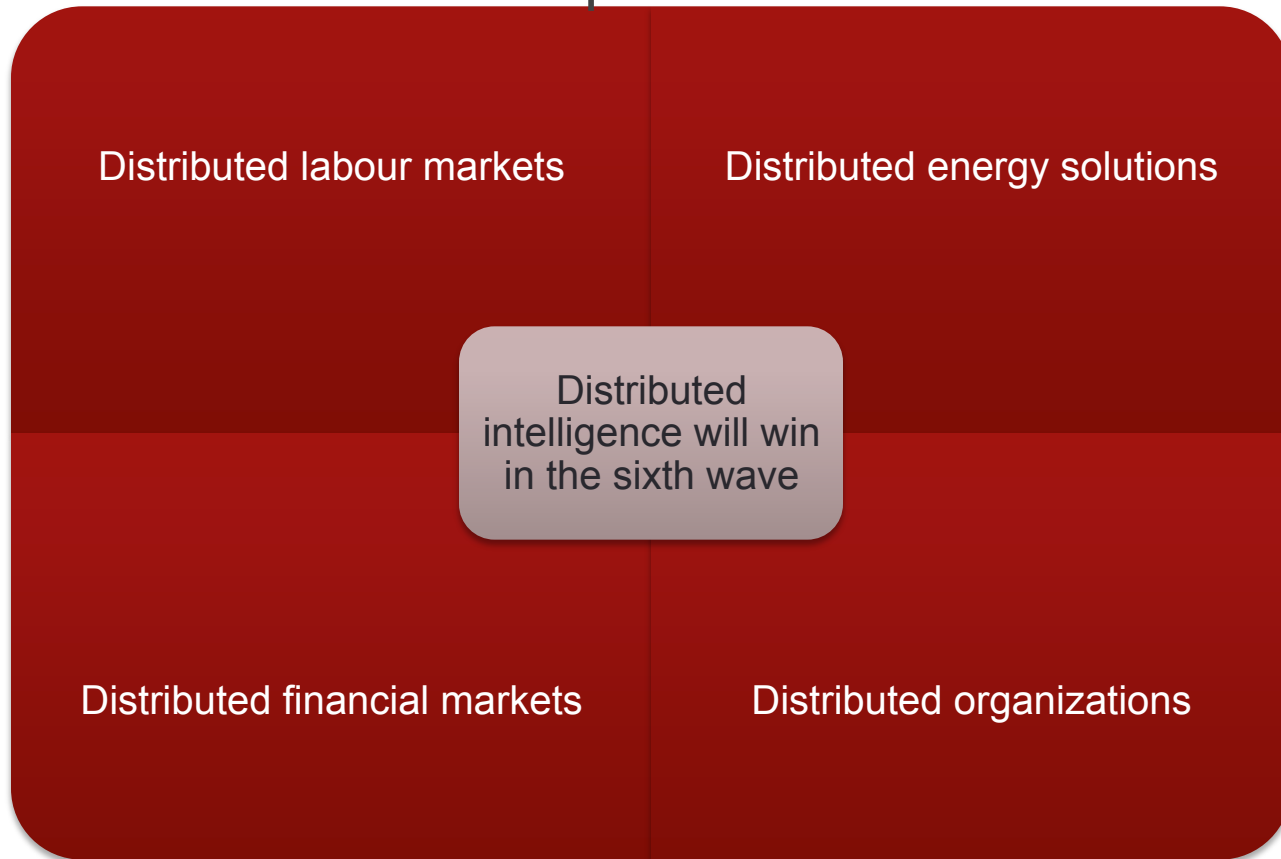
Rapid aging of technical qualifications

The growing role of personal skills

The continuous rise of quality requirements in production

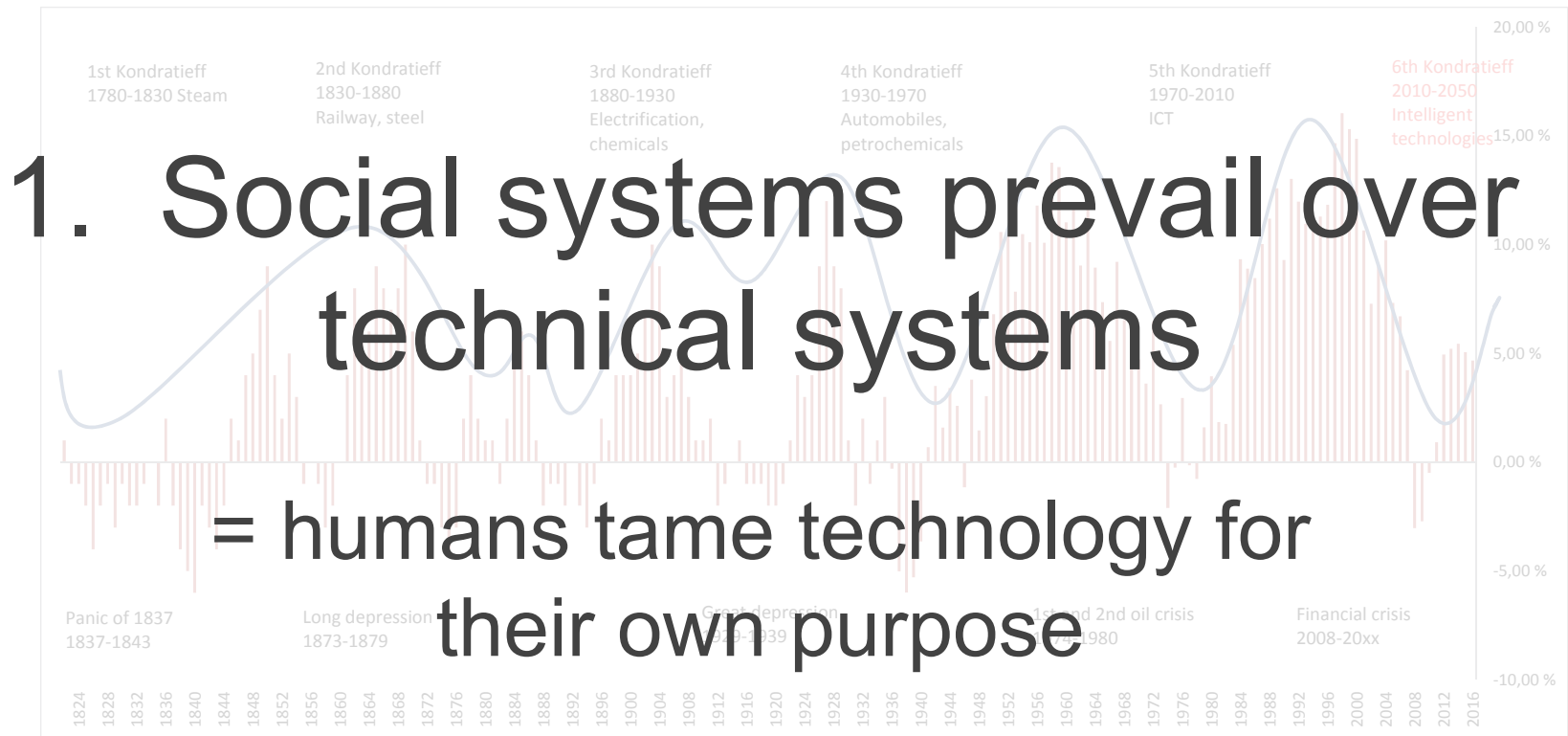


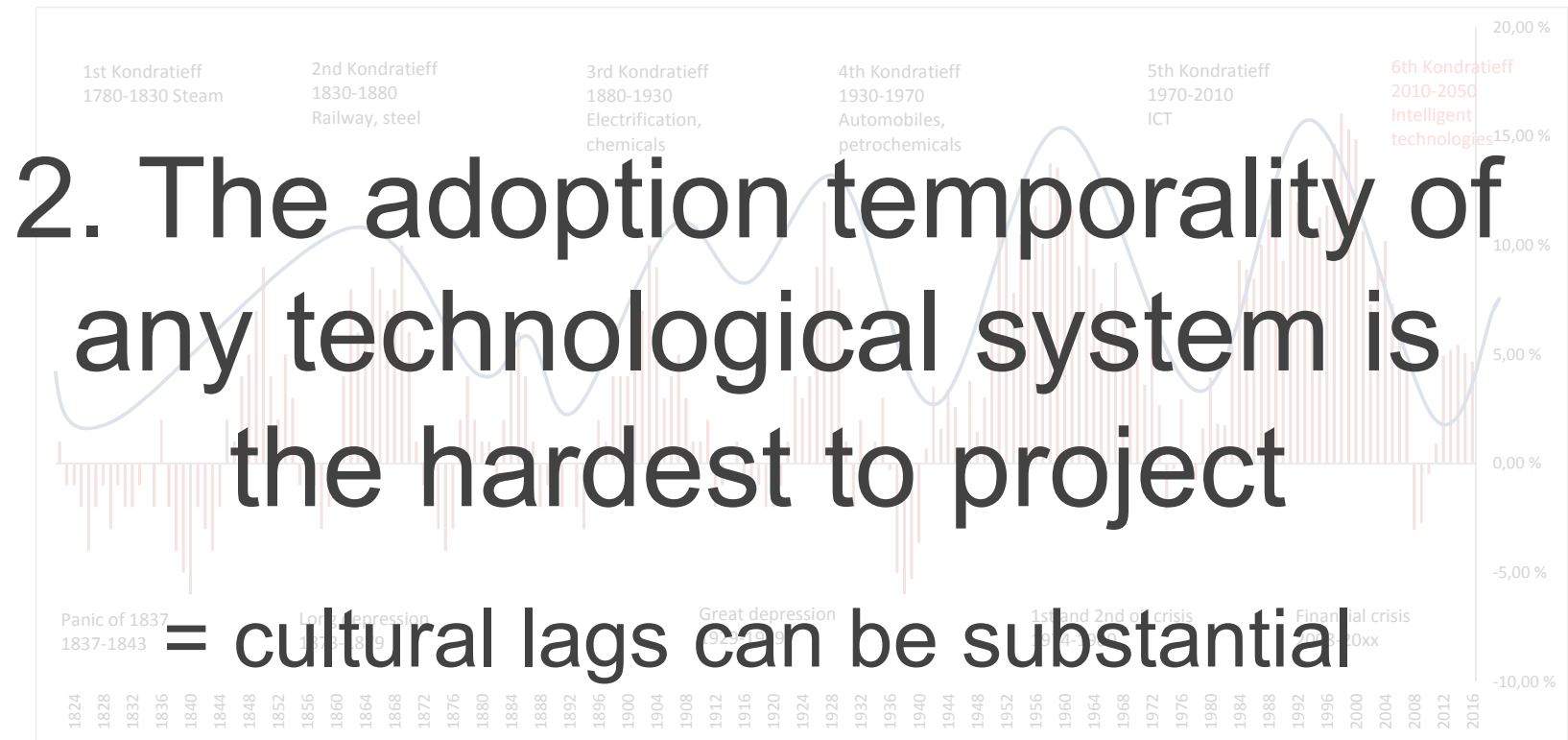
Complexity suggests distributed practices

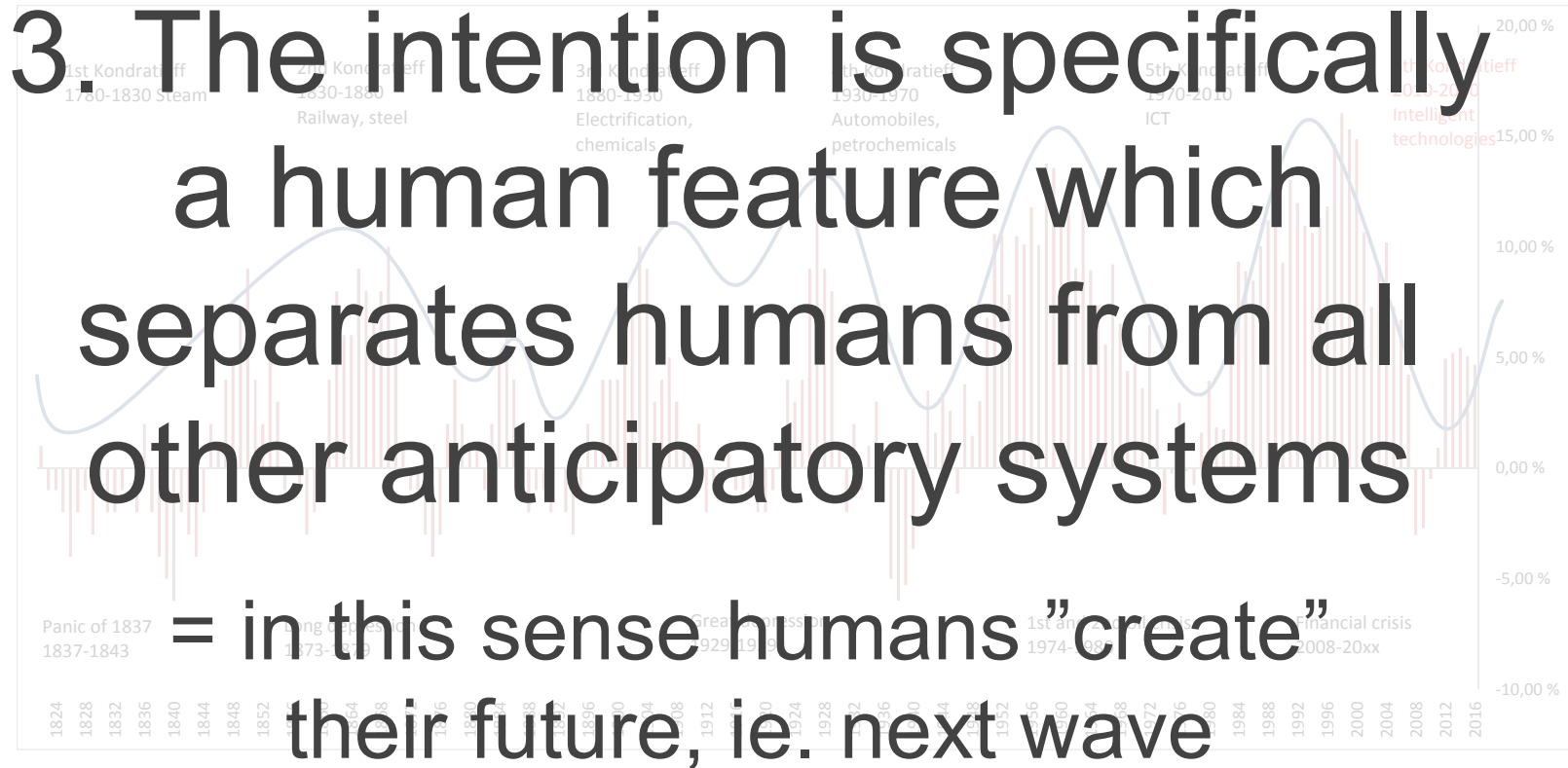


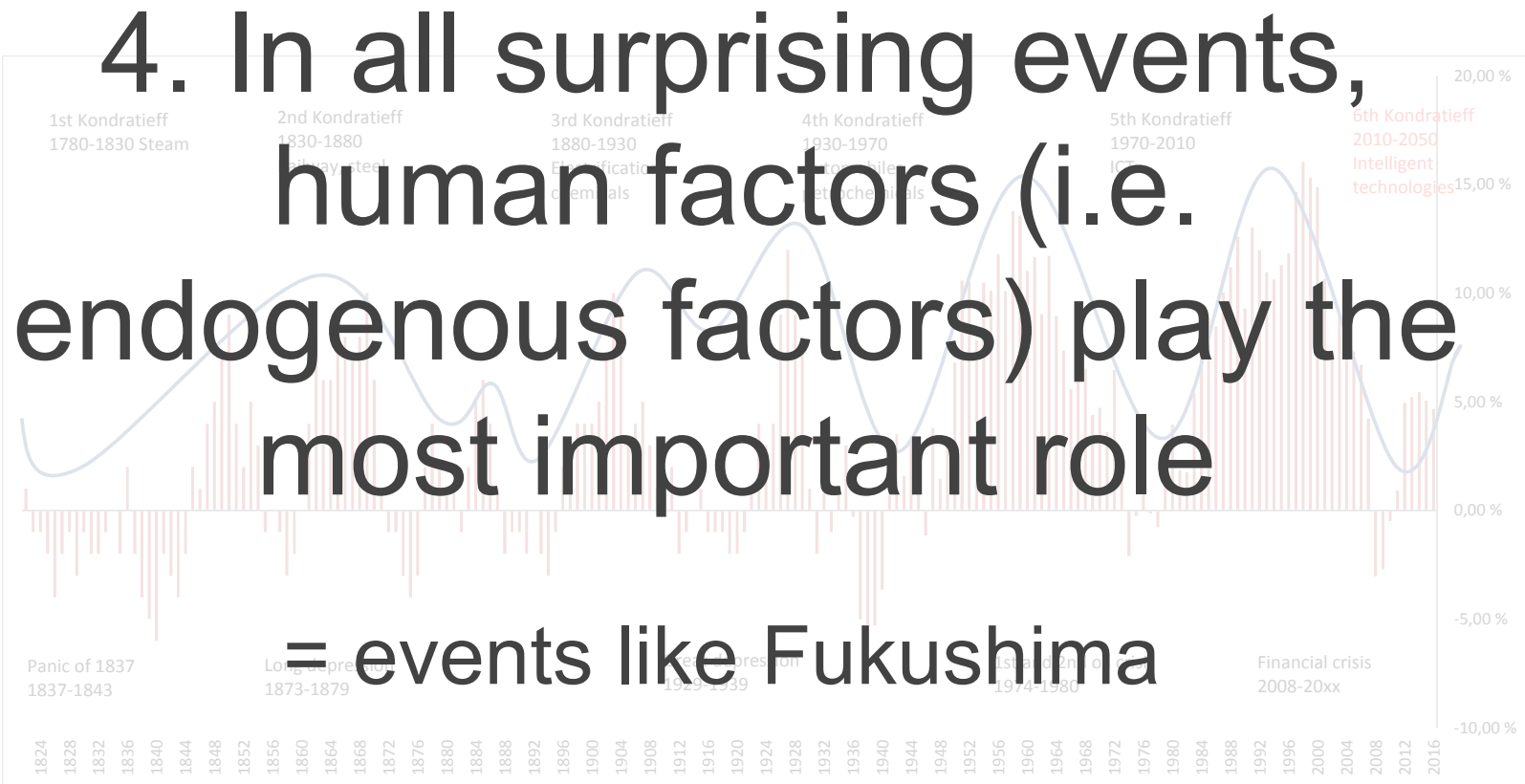
Key learnings = 12 thesis concerning anticipation



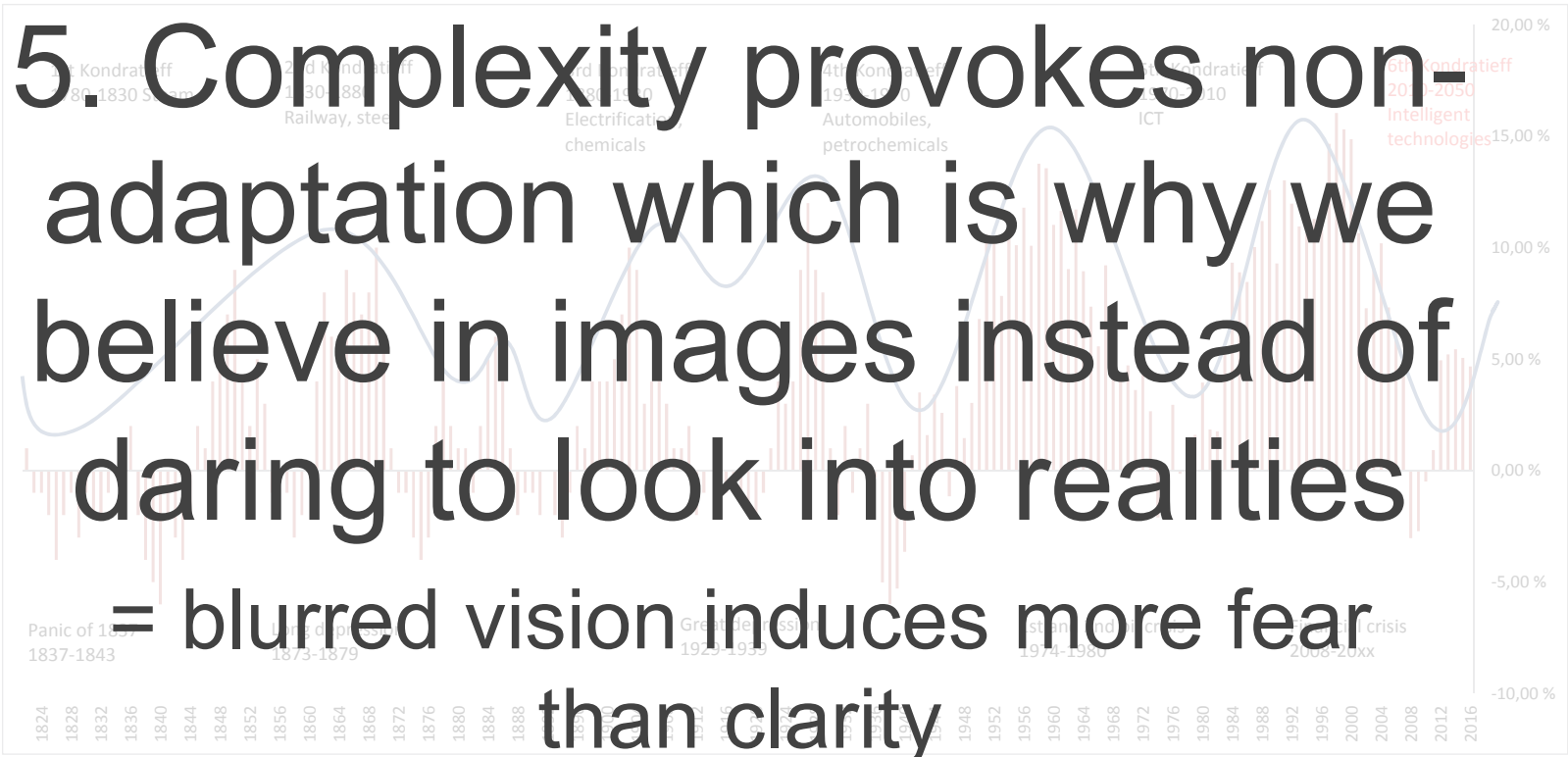


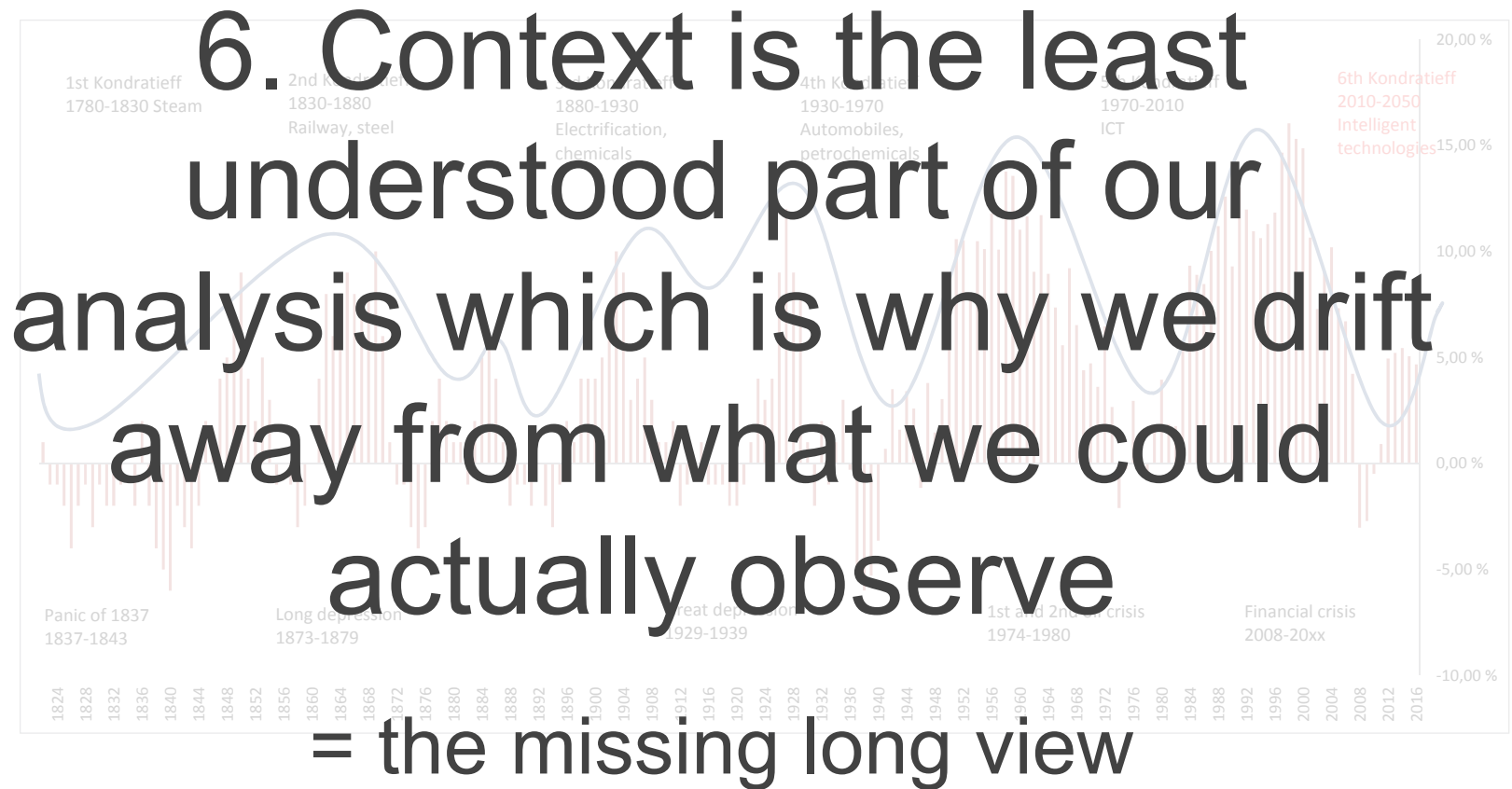


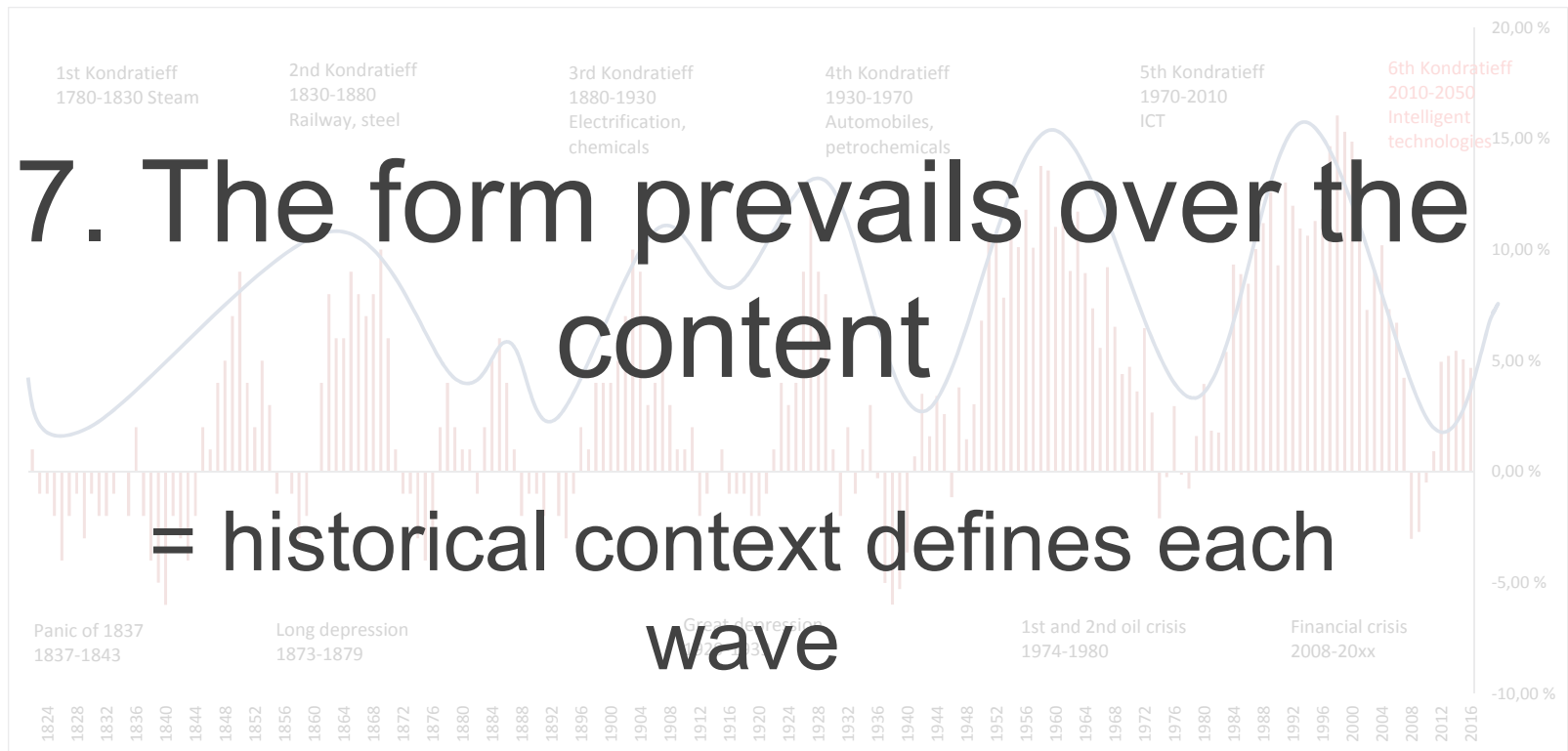


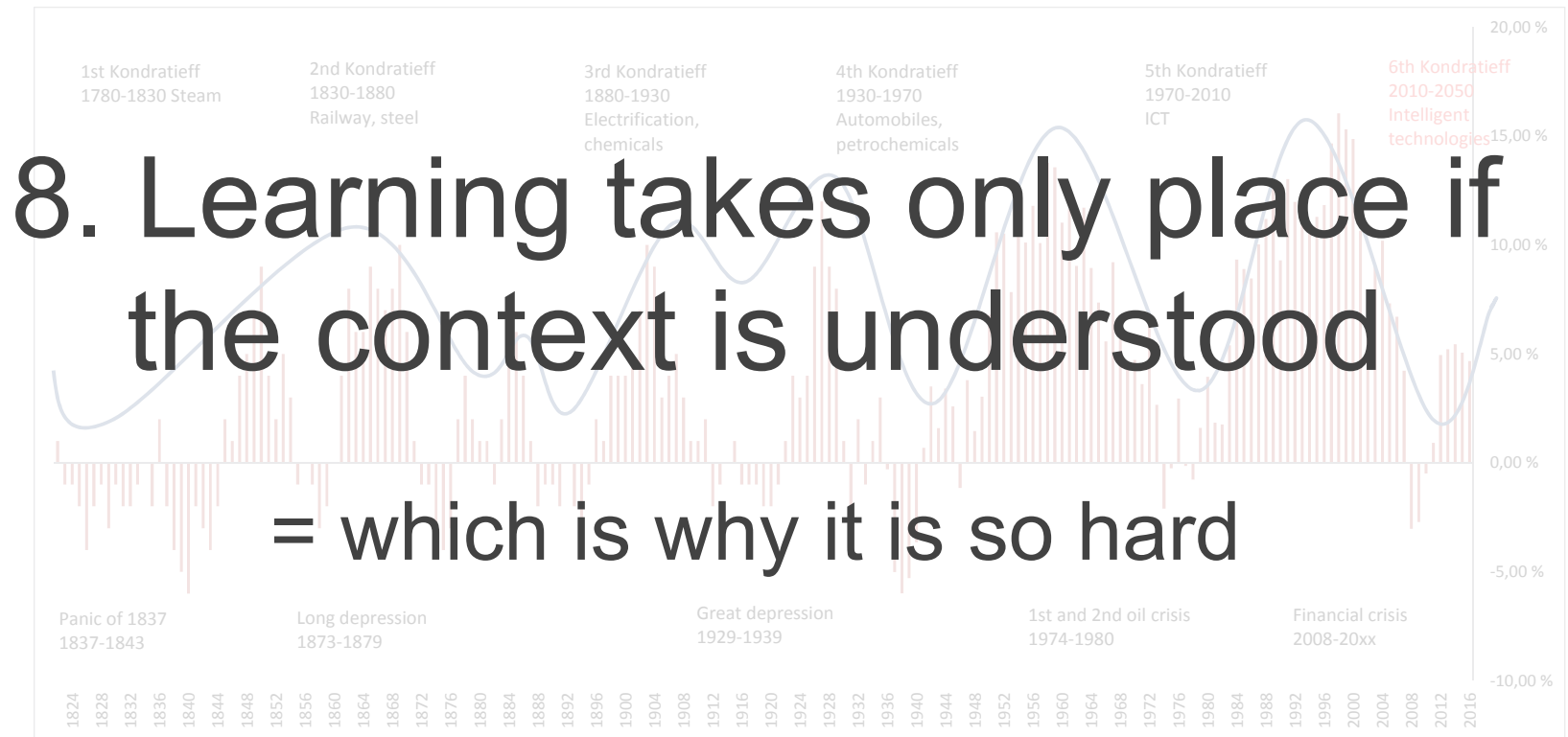


5. Complexity provokes non-adaptation which is why we believe in images instead of daring to look into realities = blurred vision induces more fear than clarity



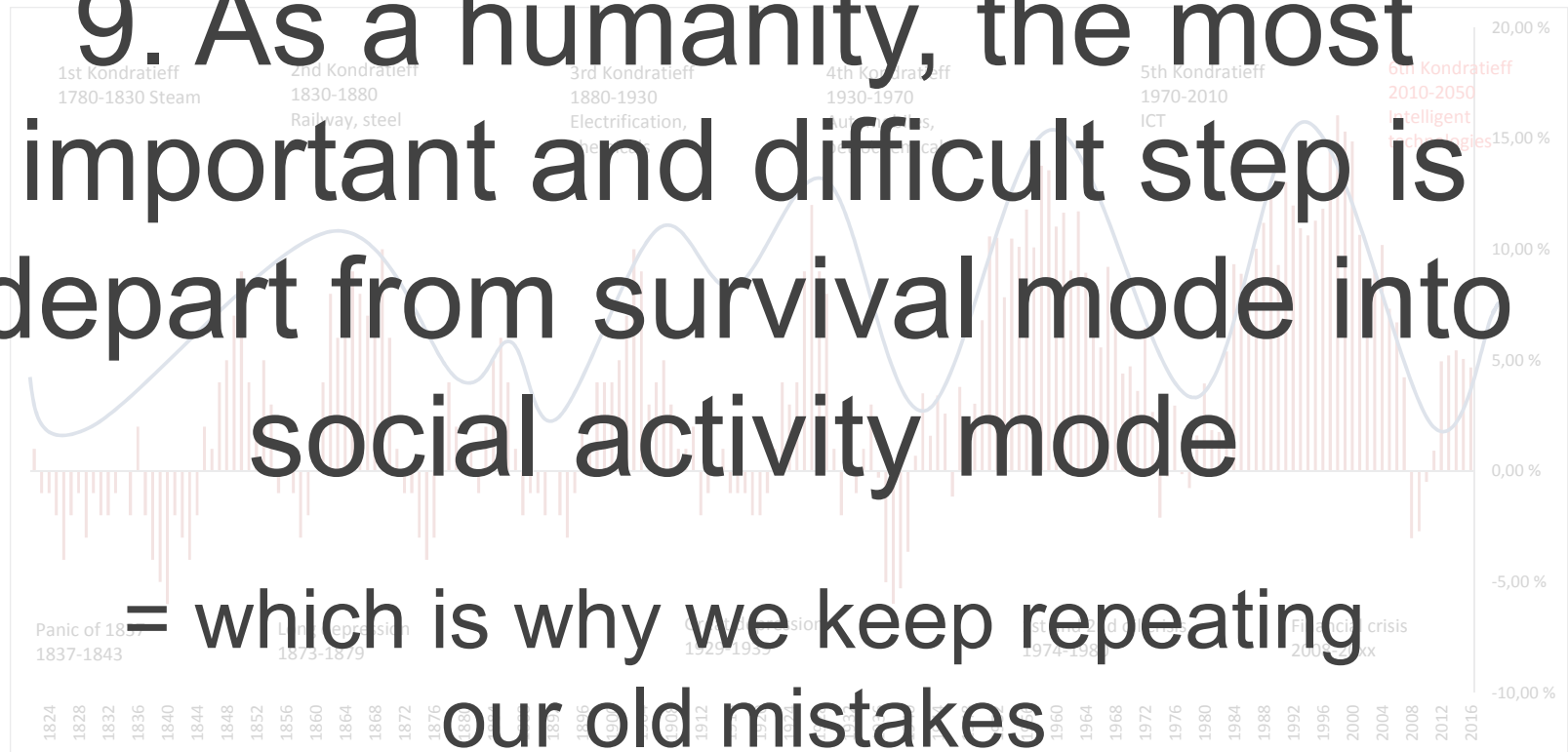


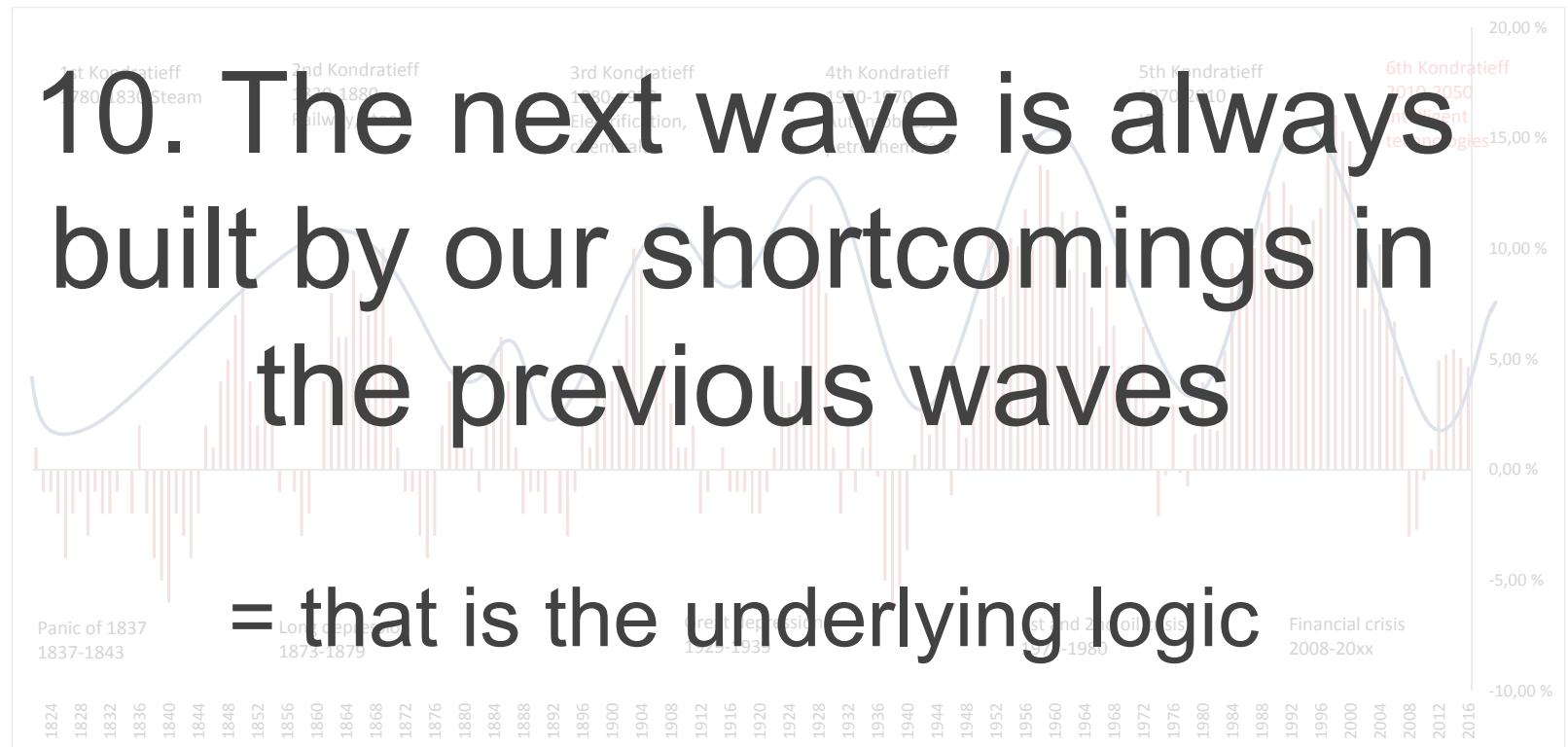




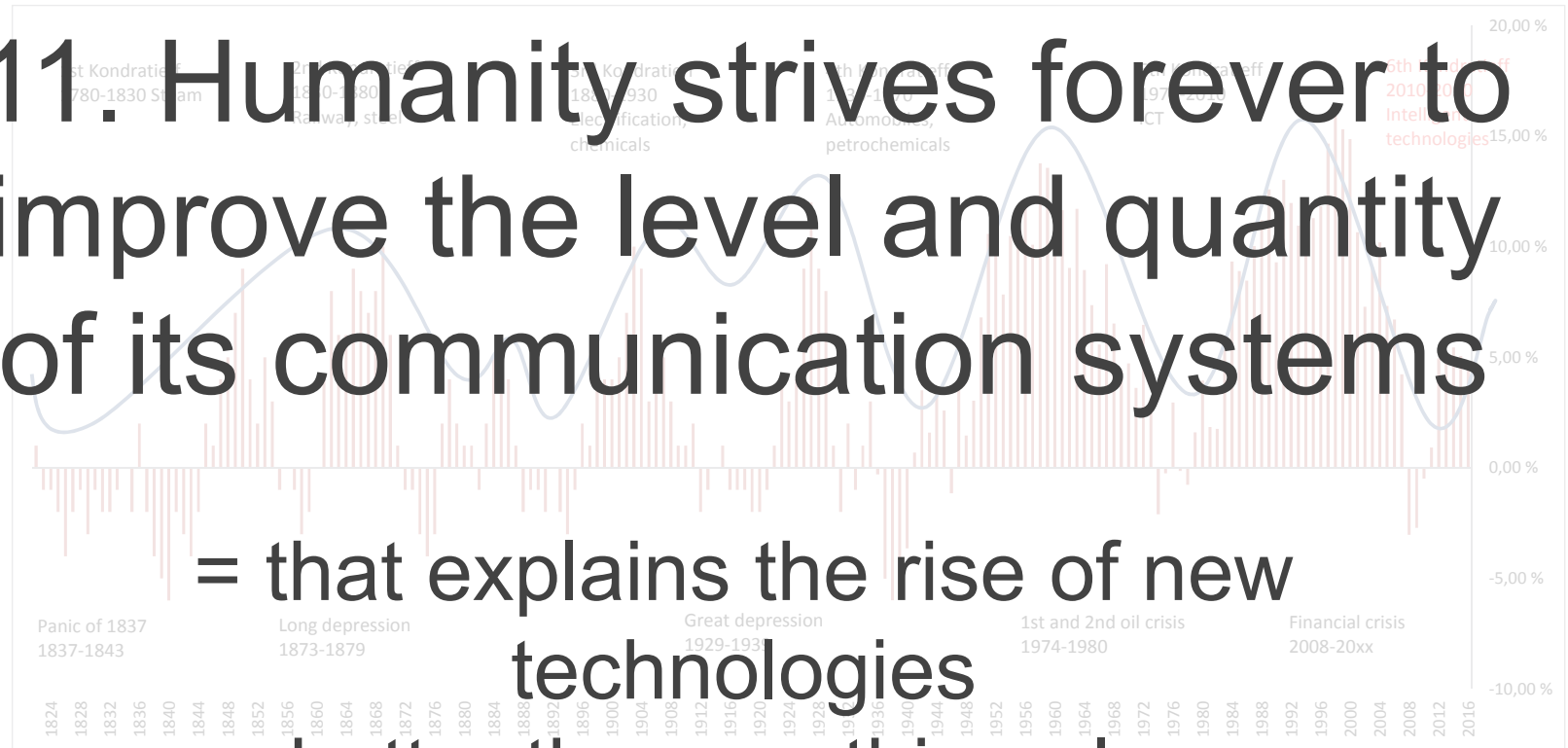
9. As a humanity, the most important and difficult step is depart from survival mode into social activity mode

= which is why we keep repeating our old mistakes

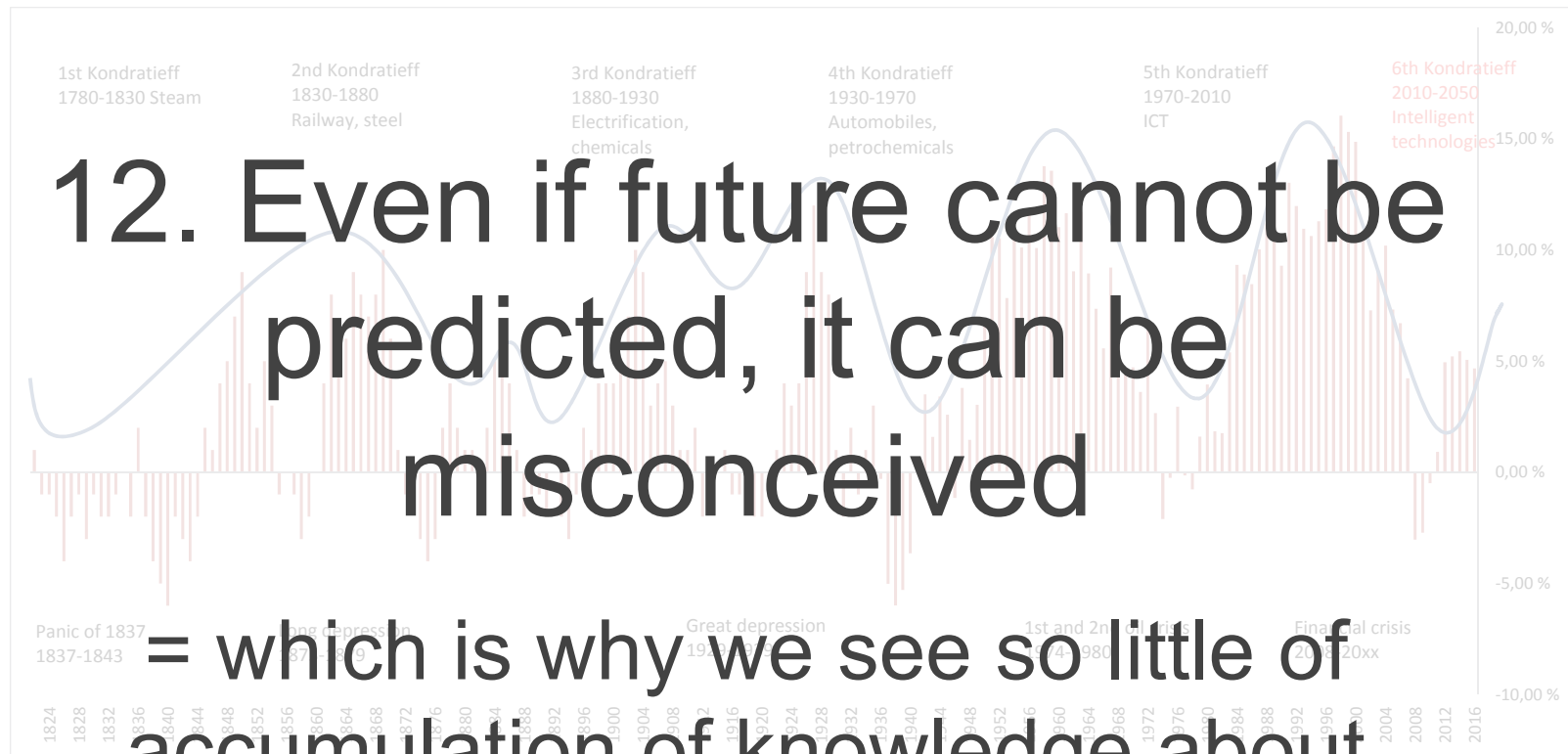




11. Humanity strives forever to improve the level and quantity of its communication systems



= that explains the rise of new technologies better than anything else



12. Even if future cannot be predicted, it can be misconceived

= which is why we see so little of accumulation of knowledge about how future unfolds

My thesis compiled

1. Social systems prevail over technical systems = humans tame technology for their own purpose
2. The adoption temporality of any technological system is the hardest to project = cultural lags can be substantial
3. The intention is specifically a human feature which separates humans from all other anticipatory systems = in this sense humans "create" their future, ie. next wave
4. In all surprising events, human factors (i.e.. endogenous factors) play the most important role = events like Fukushima
5. Complexity provokes non-adaptation which is why we believe in images instead of daring to look into realities = blurred vision induces more fear than clarity
6. Context is the least understood part of our analysis which is why drift away from what we could actually observe = the missing long view
7. The form prevails over the content = historical context defines each wave
8. Learning takes only place if the context is understood = which is why it is so hard
9. As a humanity, the most important and difficult step is depart from survival mode into social activity mode=which is why we keep repeating our old mistakes
10. The next wave is always built by our shortcomings in the previous waves = that is the underlying logic
11. Humanity strives forever to improve the level and quantity of its communication systems=that explains the rise of new technologies
12. Even if future cannot be predicted, it can be misconceived = which is why we see so little of accumulation of knowledge about how future unfolds

In my just published book you will find some more:

PATTERNS OF THE FUTURE

Understanding the Next Wave of Global Change

Patterns of the Future explains the current world using the theory of long-term development waves (Kondratiev waves). Markku Wilenius, Professor of Futures Studies, argues that we are now entering the sixth wave: the age of intelligent, integrated technologies, helping to restore the balance between humans, technology and nature by radically improved material and energy efficiency and a wiser use of human potential.

The unfolding sixth wave will challenge our current values, institutions and business models. Using a systems-based approach, *Patterns of the Future* analyses how corporations and the public sector can navigate in the sixth wave. Case studies look at specific examples of this, using high-profile companies to demonstrate both the best- (and worst-) case scenarios of innovation for change.

This book spans concepts from multiple disciplines in the social sciences, making it relevant not only to undergraduate and graduate students in futures studies, environmental studies, economics, and business, but also national policymakers, think tanks, corporate operators and indeed for any one seriously interested in the future.



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Markku Wilenius

Foreword by **Tarja Halonen**



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Thank you for your attention!

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