Looking at the future Learning from history

THE GOLDEN AGE AHEAD IS BOTH DIGITAL AND GREEN

Carlota Perez

Centennial Professor, London School of Economics, U.K. Professor of Technology and Development, Nurkse Institute, Tallinn, Estonia Honorary Professor, SPRU, University of Sussex, U.K.

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A GOLDEN AGE AHEAD?

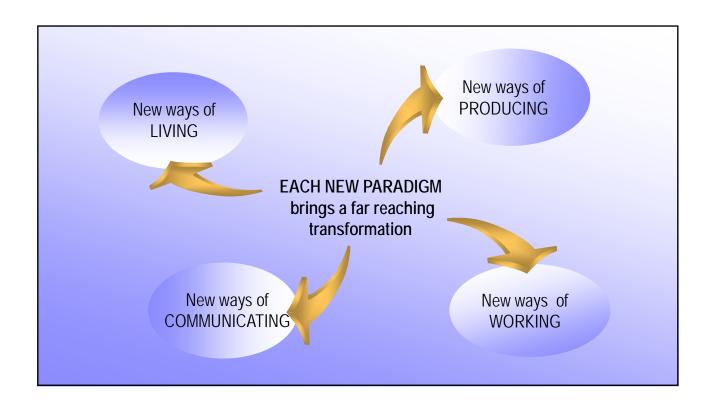
Can anybody be optimistic in today's uncertain world?

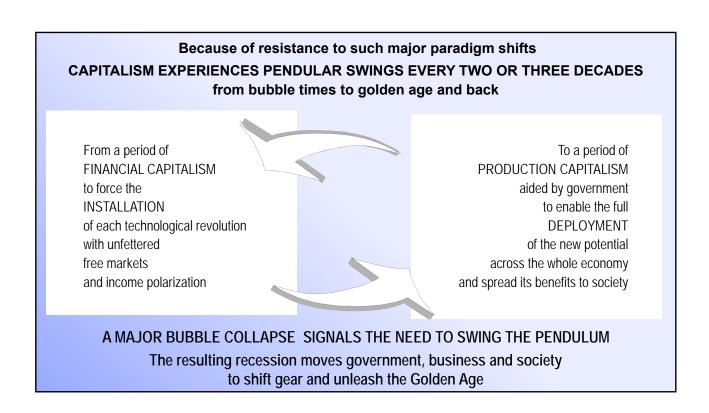
YES!

By having a historical understanding of technological revolutions and of how markets and governments influence their patterns of diffusion

The history of technological revolutions teaches us that golden ages have risen from the recessions that follow major financial collapses

| | FIVE TECHNOLOGICAL REVOLUTIONS IN 250 YEARS |
|------|--|
| 1771 | The 'Industrial Revolution' (machines, factories and canals) |
| 1829 | Age of Steam, Coal, Iron and Railways |
| 1875 | Age of Steel and Heavy Engineering (electrical, chemical, civil, naval) |
| 1908 | Age of the Automobile, Oil, Petrochemicals and Mass Production |
| 1971 | Age of Information Technology and Telecommunications |
| 20?? | Age of Biotech, Nanotech, Bioelectronics and new materials? |
| | CH ONE LEADS TO A TECHNO-ECONOMIC PARADIGM SHIFT ection for innovation and organisation across the economy and society |





| | | The historical | record: bubble p | rosp | eritie | es, recessions ar | nd golden ages | |
|-----------------|------|---------------------|--|---------|--------------------------------|--|----------------|--|
| | | INSTALLAT | ION PERIOD | rece | collaps ssion | DEPLOYMEN | T PERIOD | |
| | | | Bubble prosperity | | NING INT | 'Golden Age' prosperity | Maturity | |
| 1 st | 1771 | | Canal mania | 179 | 3–97 | Great British leap | | |
| 2nd | 1829 | | Railway mania | 1848 | 3–50 | The Victorian Boom | | |
| 3rd | 1875 | | n funded global market infrastructure build-up entina, Australia, USA) | 189 | 0–95 | Belle Époque (Europ 'Progressive Era' (US | • | |
| 4 th | 1908 | | The roaring twenties Autos, housing, radio, aviation, electricity | 19 I | urope 29–33 JSA 29–43 | Post-war Golden age | | |
| 5 th | 1971 | Inte Global fina | ernet mania, Telecoms, emerging markets ancial casino & housing | 2000-03 | 2008 20?? | | | |
| | | | | | We are I | nere | | |

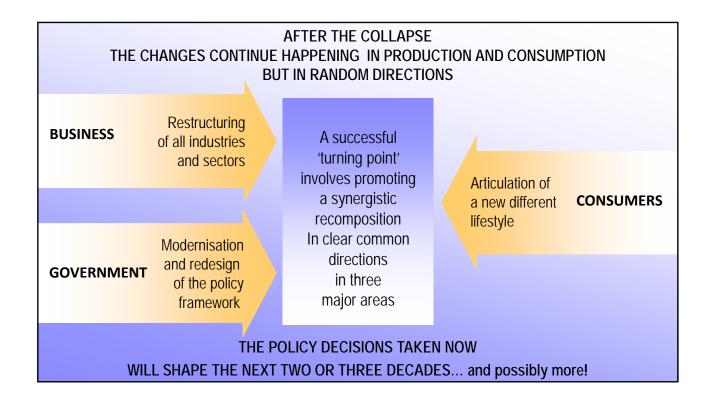
BUT GOLDEN AGES DON'T COME AUTOMATICALLY

They must be facilitated by an active State
giving a direction for innovation
widening markets
and ensuring social stability

WHY?

Because markets alone cannot change the context

| | INSTALLATION | Turning point | DEPLOYMENT |
|----------------------|--|---|--|
| Production structure | Creative destruction turbulent decline and rise | e shift | Creative construction; growing synergies in skills and supplies; new distribution of big and small firms |
| Investment | Concentrated in new technologies and finance | pse. to promot v lifestyles | Widely spread across the real economy transforming all sectors |
| Finance | Self-serving casino behaviour | le colla nework and nev | Profitable services to the new real economy |
| Government | Impotent, stays out (or is pushed or | post bubble colla trional framework oduction and nev | Active, shaping markets and guiding innovation |
| Employment | Declining with modernization and geographical shifts | Recession post bubble collapse. Need to redesign institutional framework to promote shift from finance to production and new lifestyles | Reviving with new fabric of the economy (depending on policy) and especially with new lifestyles |
| Innovation | New products, services, processes and infrastructure | R I to redesi from fin | Institutional and social innovations helping transform production |
| Direction of shaping | Technology shapes society | Neec | Society shapes technology |



EACH GOLDEN AGE BRINGS A NEW ASPIRATIONAL IDEAL OF THE 'GOOD LIFE' Based on new goods and services at 'affordable' prices

From the 1850s: VICTORIAN LIVING

The rise of the <u>urban</u> upper and middle classes different from the rural aristocracy

From 1900: THE BELLE ÉPOQUE

<u>Cosmopolitan</u> lifestyles for upper and middle classes across the world

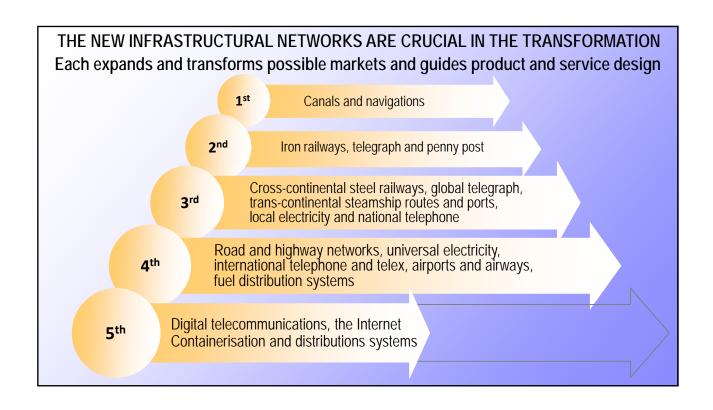
After WWII: THE AMERICAN WAY OF LIFE

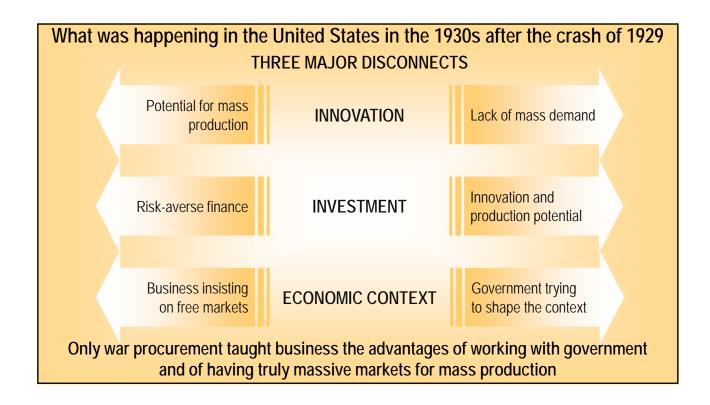
<u>Suburban</u> lifestyles, reaching all workers in the advanced countries and middle classes in the 'third world'

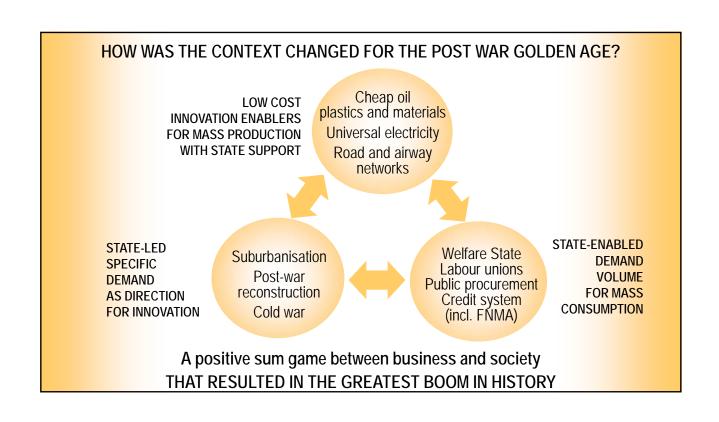
Now: SUSTAINABLE & TAILORED LIFESTYLES?

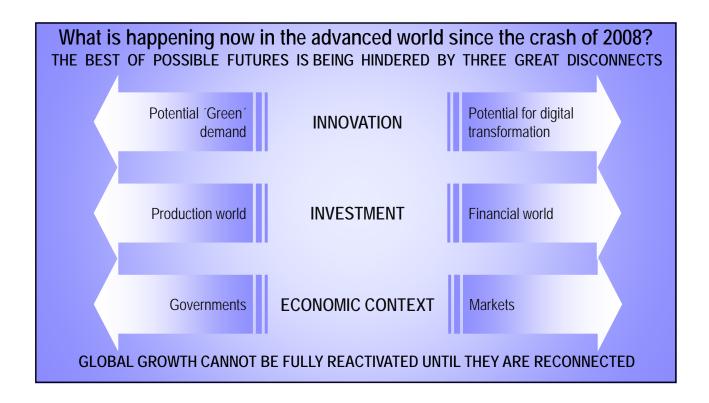
<u>Global diversity</u>, urban and rural, using ICT in a green direction and lifting all boats???

EACH NEW LIFESTYLE SPREADS FROM THE ELITES TO WIDER SECTIONS OF SOCIETY It shapes the consumption desires of the majority and guides innovation trajectories









WHY GREEN?

What is its relation with ICT?
What is meant by 'green growth'?

THE INTRINSIC CHARACTERISTICS OF ICT ARE COMPATIBLE WITH 'GREEN'

The paradigm shift that began in the 1970s has gradually made that clear

FROM THE LOGIC OF CHEAP ENERGY (oil) for transport, electricity, synthetic materials, etc.

Preference for tangible products and disposability Unthinking use of energy and materials

Unavoidable environmental destruction



TO THE LOGIC
OF CHEAP INFORMATION
its processing
transmission and productive use

Preference for services and intangible value Huge potential for savings in energy and materials

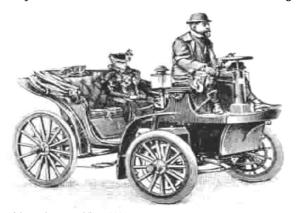
Potential environmental friendliness

SO DIGITISATION AND GREEN ARE 'MADE FOR EACH OTHER'
The environment is not the problem... It's the solution!

Dynamic growth can occur with a radical increase in the proportion of intangibles in both lifestyles and GDP
BUT THE NEW POTENTIAL IS ONLY SLOWLY EMERGING

WHY?

Because each new paradigm must at first be still wrapped in the old



Early automobiles looked like horse-driven carriages

One of the early automobiles 1898

Reproduction: L. De Vries. 1972

If and when the context is changed by intelligent policies, consumers and businesses will respond

THE TRANSFORMATION SPACES FOR THE NEW 'GREEN' PRODUCTION AND LIFESTYLES

An aspirational

'good life'

with less energy

and materials,

more ICT and

more jobs

HUMAN CENTRED SERVICES

Health and care
Leisure and sports
Entertainment
Mobility & Distribution
Diversified electricity
Education 'industry'
The arts
Intermediation
Sharing and barter
Conservation
Logistics

Maintenance
Resource recovery, recycling, reuse
Pollution reduction

And so on

MODERNISATION OF PRODUCTION

Circular economy
Truly durable products
3-D printing
Rental model
Nanotechnology
Renewable energy
Batteries & carbon capture
Sustainable architecture
New construction methods
Bio-plastics & Custom materials
FTTH and Wi-Fi infrastructure
Smart electrical grid
Complex systems engineering
Hydroponics and urban agriculture
and so on

Massive innovation and massive employment, next to robotics and Al in sustainable activities, enhanced and enabled by ICT

THE BEST OF POSSIBLE FUTURES REQUIRES THREE RECONNECTIONS

A CLEAR DIRECTION FOR INNOVATION

Digital + Green and full global development

A STRONG REVIVAL OF 'REAL' INVESTMENT

Recoupling of the financial world with production

A DYNAMIC AND STABLE ECONOMIC CONTEXT

Strong consensus between business and government

SUCH A TILTING OF THE PLAYING FIELD

CAN OPEN INFINITE BUSINESS OPPORTUNITIES AND IMPROVE THE LIVES OF THE MAJORITY

IT'S UP TO ALL OF US TO MAKE IT HAPPEN

AND THIS TIME THE EUROPEANS CAN BE THE PIONEERS

THANK YOU! For more about all this: www.carlotaperez.org