

ICT and New Economy

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Features of ICT I

ICT are

- a) a set of technologies, that
- b) change social processes and
- c) show microeconomic as well as
- d) macroeconomic implications.

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Features of ICT II

Relevant aspects:

- Ø Demand- and supply-sided increasing returns to scale
- Ø Network externalities
- Ø Human capital intensive
- Ø General Purpose Technology
- Ø Productivity growth

A New Economy? I

What is new?

- Ø New economic rules?
- Ø Growth without inflation?
- Ø Stock market boom?
- Ø New industry structures?
- Ø New factors of production?
- Ø An information society?

A New Economy? II

Topics in a New Economy

- Ø Attention and Experience goods
- Ø Property rights
- Ø Competition - Monopoly
- Ø Network effects
- Ø Lock-in
- Ø Path dependence

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Network effects I

Network effects

User	0	10	20	30	40	50	60	70	80	90
Tech A	10	11	12	13	14	15	16	17	18	19
Tech B	4	7	10	13	16	19	22	25	28	31

Source: based on Arthur 1989

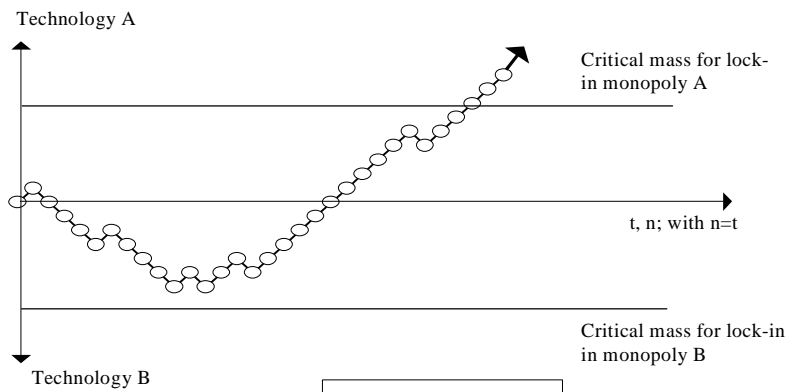
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Network effects II

Path dependence: Alternative Technologies



Quelle: based on Arthur (1989), p. 120.

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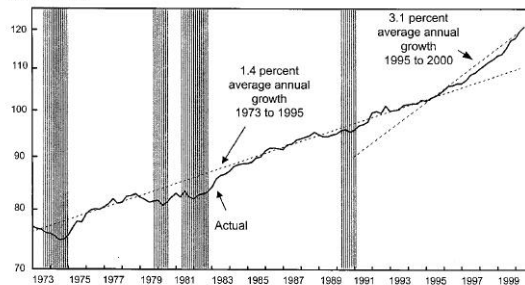
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A New Age? I

The rate of productivity growth increased after 1995.

Chart 1-3 Output per Hour in the Nonfarm Business Sector
Index, 1992 = 100



Note: Productivity is the average of income- and product-side measures. Productivity for 2000 is inferred from the first three quarters. Shading indicates recessions.
Sources: Department of Commerce (Bureau of Economic Analysis) and Department of Labor (Bureau of Labor Statistics).

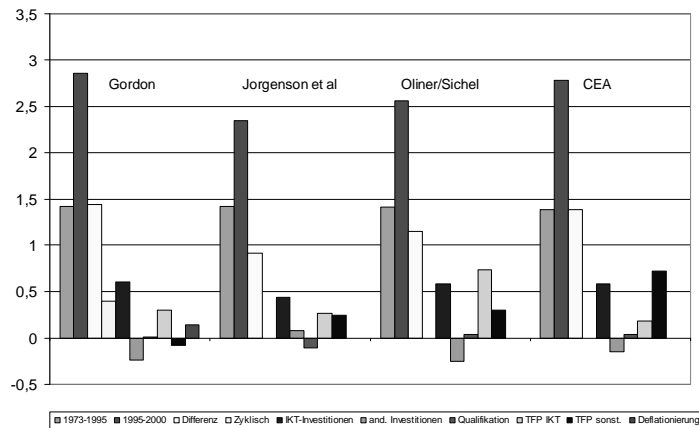
Quelle: CEA 2001, S. 27

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A New Age? II



Source: based on data by Krämer (2002) and Baily (2002)

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What's going on?

Questions:

- Ø Does a new productivity regime prevail?
- Ø Which are the effects on employment?
- Ø Can we support a growth process based on ICT?

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What's going on? I

Implications of ICT

- Ø Marginal productivity of capital rises.
- Ø Rate of exogenous technical progress rises.
- Ø Capital becomes efficient.
- Ø Labor can be saved.

What's going on? II

Consequences:

- Ø Investment rises.
- Ø Potential output grows.
- Ø Effective demand increases.
- Ø Demand-driven productivity growth

Experience in the US

Positive Feedback Loop in the US?

- Ø Stock market boom
 - Ø 'Wealth effect' and 'cheap finance'
- Ø Low inflation rates
 - Ø Caused by investment in ICT
 - Ø Low interest rates
- Ø Monetary Policy of the Fed
- Ø Investment boom in ICT

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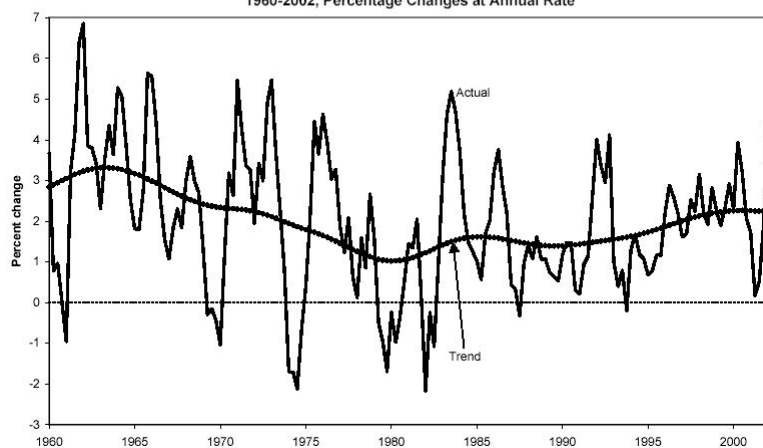
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Quelle: Gordon 2003

Figure 1

Output per Hour in the Nonfarm Private Business Sector,
Actual Change from Four Quarters Prior and Hodrick-Prescott Trend,
1960-2002, Percentage Changes at Annual Rate



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Table 2

Growth Rates of Output per Hour, Nonfarm Private Business Sector,
Selected Intervals, 1955-2002

Interval	Actual Growth	Trend Growth	Cyclical Effect
1955:Q4-1965:Q4	2.99	2.90	0.09
1965:Q4-1975:Q4	2.02	2.25	-0.23
1975:Q4-1985:Q4	1.44	1.33	0.11
1985:Q4-1995:Q4	1.39	1.54	-0.15
1995:Q4-2000:Q2	2.59	2.15	0.44
2000:Q2-2001:Q3	0.68	2.25	-1.57
2001:Q3-2002:Q2	5.46	2.22	3.24

Sources: Actual growth from Bureau of Labor Statistics, trend growth estimated as a Hodrick-Prescott filter with a smoothing parameter of 6400. The same series is plotted in Figure 1.

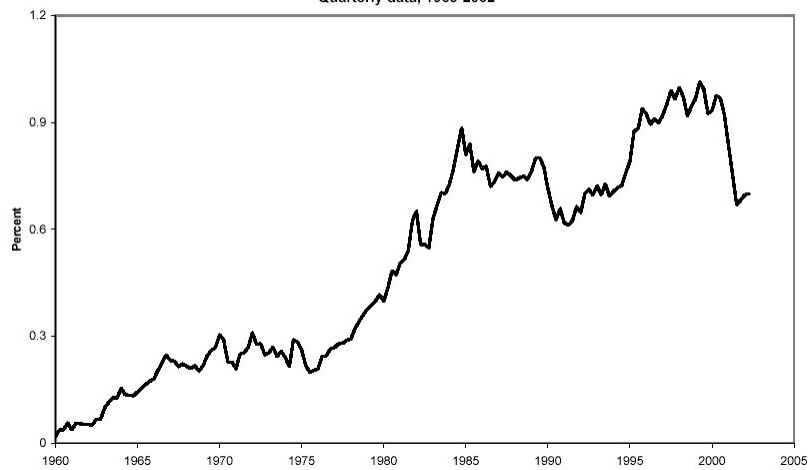
Quelle: Gordon 2003

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Ratio to Nominal GDP of Nominal Investment in Computers and Peripherals,
Quarterly data, 1960-2002

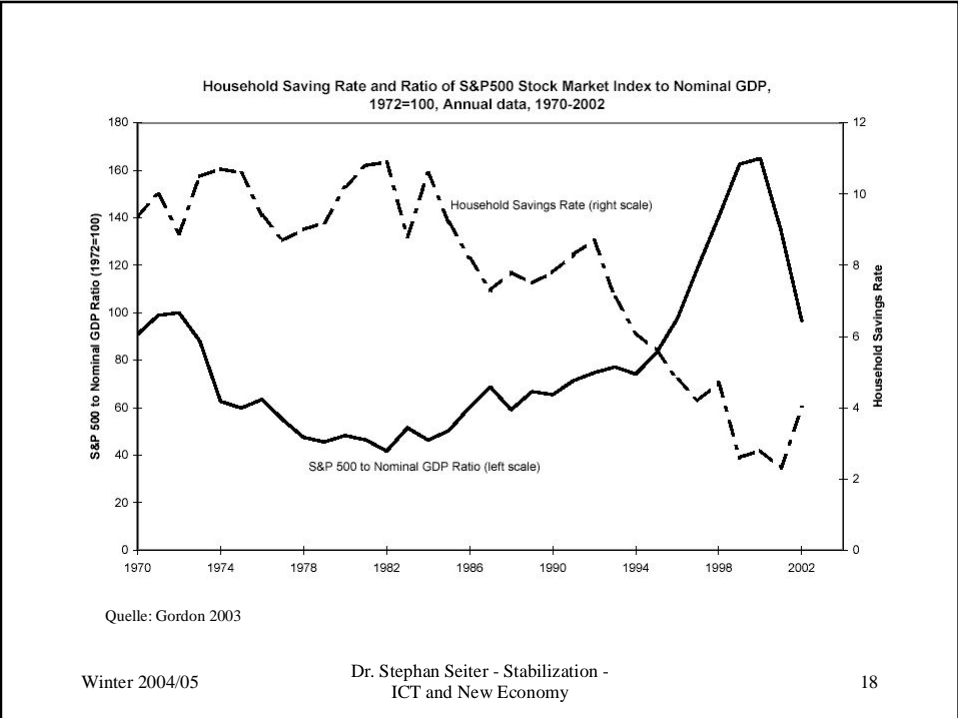
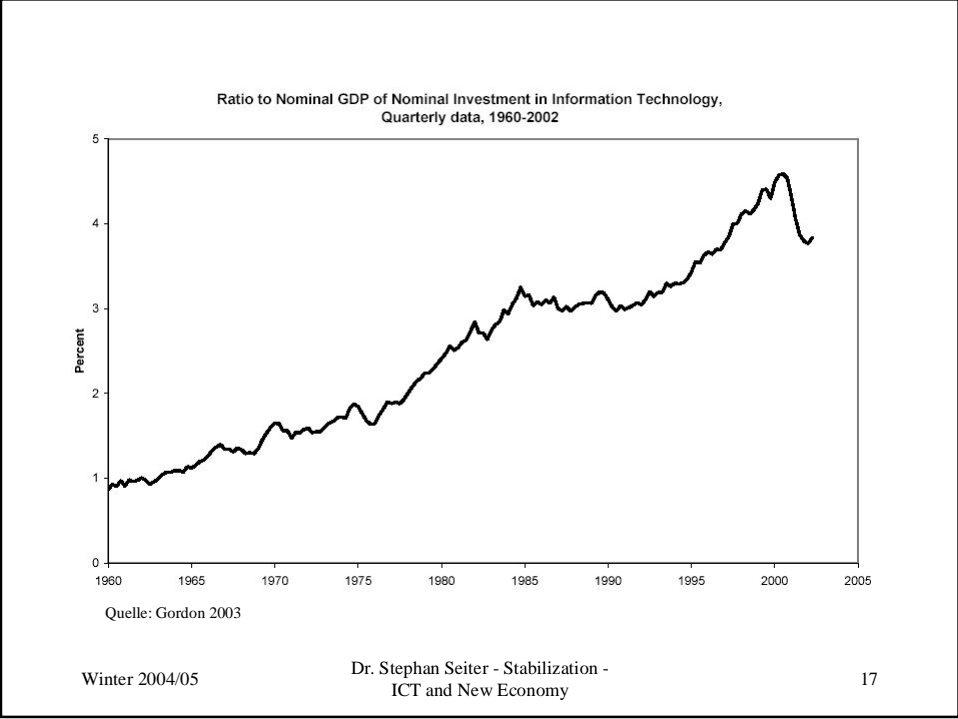


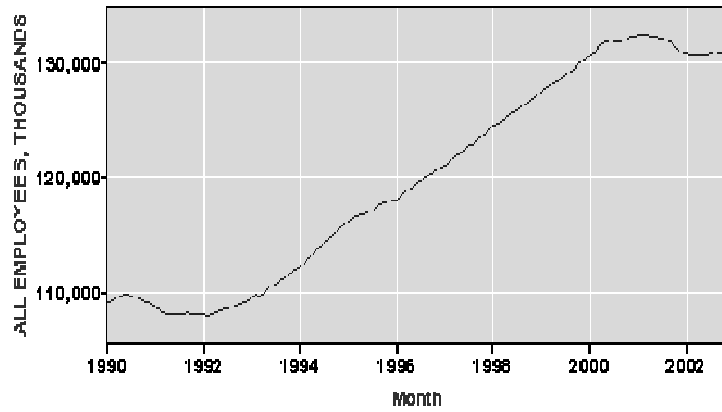
Quelle: Gordon 2003

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Quelle: BLS 2003

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Experience in the US

- Ø Effective demand was relevant for growth.
- Ø Combination of factors was perhaps unique.
- Ø "unsustainable demand for ICT" (Gordon 2003)
- Ø However: long-run effects

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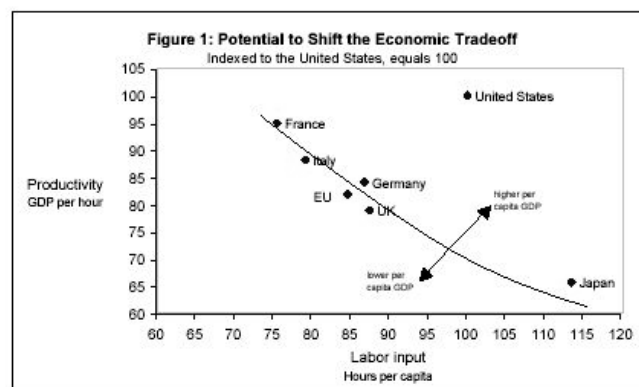
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Conclusions and Questions

- ∅ Future productivity growth is uncertain.
- ∅ Supply and Demand are crucial for recovery of the 'new economy'.
- ∅ Will effective demand 'follow' technological development?

Where are we?



Some References

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- | Baily, M.N. (2002), The New Economy: Post Mortem or Second Wind, in: Journal of Economic Perspectives, 16, pp. 3-22.
- | Gordon, R.J. (2003), Hi-Tech Innovation and Productivity Growth: Does Supply Create Its Own Demand?, NBER Working Paper #9437
- | Shapiro, C., Varian, H.R. (1999), Information Rules: A Strategic Guide to the Network Economy, Boston.
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