Comments on "The Root Cause of Economic Growth under Capitalism" by Michael Jaffe

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The Research Question

- Fact: sustained Growth in Capitalistic Societies

Propose a verbal model of the engine of growth in a capitalistic world based on the role of firms

A new micro-foundation of endogenous growth:
- Market not a necessary feature
- Competing heterogeneous firms is the key
Take-off
GDP per person in Western Europe, $’000, 1990 prices

Mechanisation in farming; steam engines; Arkwright’s spinning machine (1769); Crompton’s mule (1779); bridge at Coalbrookdale, England, first structural use of cast iron (1779)

Volta’s electric battery (1800);
electromagnetic telegraph (1833);
first transatlantic telegraph cable (1858);
Bell’s telephone (1876);
Edison’s carbon-filament lamp (1878);
Marconi’s wireless patent (1896)

Padded horse collar (around 1100); first recorded windmill with vertical sails rotating about horizontal axis (1185)

First telescopes; Huygens invents pendulum clock (1658)

Domesday Book shows 5,624 watermills in England south of the Severn

Invention and development of compass; year-round navigation in Mediterranean after 1250

Gutenberg’s printing press

Blast furnace

Advances in large-scale hydraulic engineering;

Languedoc Canal joins Atlantic and Mediterranean (1681)

Bessemer and Siemens-Martin (open-hearth) processes for making steel

Car powered by internal-combustion engine (1885); Henry Ford’s Model T (1908)

Powered flight (1903)

Source: Angus Maddison
Motivation

Fact 1. Sustained growth is not only a feature of capitalism
   - Positive growth before Industrial Revolution (IR)
   - Big take off takes place after the IR

Fact 2. Sustained Growth does not happen in all capitalistic societies (No convergence)
Theory

- Engine of growth is firms’ competition through cost-reducing activities
- Firm selection produces productivity improvements in the aggregate: similar to Schumpeter Creative Destruction
- Sources of growth:
  - cost-reducing (profit seeking) firms’ competition
  - Creative Destruction
Theory

- Technological Innovation not necessary
- Cost Reduction:
  - Capital intensity
  - Developing existing technologies/machineries
  - New Technology/Innovation
  - Learning-by-doing
  - Improvising organization
  - Cutting labor costs (wages)
Comments

- Not clear why the market is not a necessary institution
- Not clear why this is different from Marx (profit-driven innovation) and Schumpeter (Creative Destruction)
- Innovation doesn’t have to come from major technological breakthrough
  - Incremental innovation
  - Development of existing technology/products (focus on D more than R)
  - Organizational change
Firm Heterogeneity and Creative Destruction

  - Engine of growth is profit driven introduction of new product/machines (Romer), of new quality of existing products/machines replacing the old (Creative Destruction)

- Heterogeneous firms
  - Similar innovation dynamics but size/productivity heterogeneity across firms/product leading to heterogeneous growth rates
Existing models so far not satisfactory in terms of some microeconomic predictions

Too much “creative destruction”; in practice, most of R&D from existing firms and plants. E.g.: Bartelsman and Doms (2000) and Foster, Haltiwanger and Krizan (2000): entry and exit account for about 25% of average TFP growth, with the remaining accounted for by continuing plants.

Too much entry by “large firms”— entering firms are small; many are unsuccessful, but some growth rapidly (Akcigit and Kerr, 2010).

Also for policy analysis: What are the implications of “industrial policy” on innovation in reality?

E.g., bailout of GM and Ford or lowering entry barriers.
Heterogeneous productivity

- Mortensen and Lentz (2008) Danish firm-level data
Heterogeneous growth

- Firm-size and Innovation inputs and outputs (Akcigit and Kerr, 2011)

**Fig. 1: Exploitation R&D behavior among US firms**

**Distributions of firm size and growth**

1A: Share of firms that self cite past work by firm

- Gray: Exiting firms, major declines
- Black: Stable employment
- White: Entrants, major growth

1B: Average share of citations that are self citations

1C: Share of firms undertaking process oriented R&D

1D: Average share of R&D that is process oriented

Notes: Figure shows basic regularities on firm R&D and patenting for innovative firms that conduct R&D or file patents. Data are taken from US Census Bureau and NBER Patent Database. The three groups of columns are chart separate firms by employment size. Within each triplet, firms are further divided by whether they self-cite past work (A) or whether they conduct process oriented R&D (C). Of the citations referred to in USR, 36% are self citations, which is highest for small firms (1-500 employees) and lowest for large firms (5001+ employees).