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## SUMMARY 5

### GROWTH THEORY: ENDOGENOUS GROWTH

Readings: Slides, Sørensen og Whitta-Jacobsen (2005), Ch. 8.

#### **Conditions for endogenous growth**

Definition of endogenous growth; Crucial assumption for perpetual growth in GDP per capita: drop “upper” Inada-condition. Technical requirement is: marginal product of capital is bounded away from 1, or, constant returns to reproducible input(s). This is needed asymptotically at least; the AK model vs. the “asymptotic” AK model; phase diagrams; Predictions: permanent changes in structural characteristics lead to permanent changes in growth rates; the problem with lack of “conditional convergence” in Ak model; If competitive markets this requirement means capital share is (tending towards) 1 - problematic.

#### **Theories for endogenous growth: Learning by doing**

Knowledge acquired on the job; informal knowledge; the Liberty Ship (internal learning); semi-conductors (external learning); elasticity of cumulated output wrt productivity of about 0.15. Capital increases productivity as a result of learning; the required size of the impact from K to A so as to generate growth; law of motion of capital with learning and endogenous growth; the problem of scale effects – their source and a potential resolution; the steady state of the model reproduces the Kaldorian facts even though growth is endogenous.

*Empirical critique:* in OECD investments are trending, whereas growth rates do not; Across the world: growth is fairly unstable, whereas investment rates are more persistent over time; Investments correlate more with levels than growth rates; TFP unstable from decade to decade, capital accumulation more persistent.

Definition of semi-endogenous growth; empirically attractive since requirements for increasing returns to scale are lowered to (potentially) empirically reasonable magnitudes; produces a steady state where investment rates matter for levels rather than growth (consistent with evidence); the size of the population does not spur long-run growth, but raises levels; rate of population growth (or labor force growth) drives growth. *Empirical Critique:* labor force growth (or population growth) highly persistent whereas GDP per worker or TFP growth are not; the correlation between labor force growth (population growth) and growth in TFP is negative, not positive; Little evidence in favour of scale effect on levels.

Alternative view: endogenous growth speaks to “global growth”, rather than local growth. Most small countries, growth is exogenous. Technology adoption and differences in long-run levels of technology.