Keynesian Growth and Instability

Steven Fazzari, Piero Ferri, Edward Greenberg, and Anna Maria Variato (ROKE, 2013 + recent extensions)

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Demand and Growth

• *Intrinsic* Keynesian model: demand generation process *not* automatic
• Long-term growth persistent, where does demand growth come from?
• Moments near full employment
• Mainstream growth models emphasize technology and resources: necessary but not sufficient
Rediscovering Harrod

- Baseline Keynesian growth model
  - Simple, one-sector model; linear saving and production
  - Investment targets expected capital-output ratio (utilization)

- Results:
  - Warranted rate – steady-state growth rate:
    - If it’s expected, it actually prevails
  - But steady state unstable: knife edge
  - Unattractive as empirical prediction: economies don’t seem to explode or implode

- Conclusion: basic Keynesian demand dynamics unstable, but that can’t be the whole story
  - Need alternative structures to explain realistic growth paths
Vision of New Work

- Can Harrod’s instability result explain persistent growth?
- Upward instability drives demand growth until resource constraints bind
  - Systematic demand growth not an “equilibrium” or “steady state” result
  - Moments of full employment
  - Link to Marc Lavoie point: full employment as a “fluke”
- Also need to contain downside instability
  - Hicks & Minsky: floors and ceilings
A Twist on Harrod’s Theme

- Instead of “disappointment,” instability is our friend
  - Source of persistent demand growth
  - Allows economy to exploit expanding production possibilities, at some points in time
- If resource constraints bind; follow “potential” path
- But potential path is not stable
  - Negative shocks send system to “floor” again, until unstable positive growth restored
Basic Model

- Demand drives output
  \[ Y_t = \min (AD_t, Y^*_t); \quad AD_t = C_t + I_t \]

- Linear consumption:
  \[ C_t = (1-s) EY_t = (1-s)(1+Eg_t)Y_{t-1} \]

- Investment targets adjustment to desired capital
  \[ K^*_{t+1} = v^* EY_{t+1} = v^*(1 + Eg_t)^2 Y_{t-1} \]
  \[ I_t = v^*(1 + Eg_t)^2 Y_{t-1} - (1-\delta)K_t \]
Basic Growth Dynamics

- Law of motion for growth rate, conditional on expectations and lagged utilization of capital

\[ 1 + g_t = v^*(1 + E g_t)^2 - (1 - \delta)(K_t / Y_{t-1}) + (1 - s)(1 + E g_t) \]

- Note typical Keynesian features: rising demand components stimulate growth

- Warranted rate:

Set \( g_t = E g_t = g^* \); set \( v_t = v^* \) \( \Rightarrow g^* = (s / v^*) - \delta \)
Basics of Instability

- At $E_{g_t} = g^*$:
  
  \[ \frac{d g_t}{d(E_{g_t})} = 1 + s + 2v^*(1 - \delta) > 1 \]

- Any deviation of $E_{g_t}$ from $g^*$ is magnified for any value of basic parameters

- Behavioral restriction:
  
  \[ g_t < E_{g_t} \implies E_{g_{t+1}} < E_{g_t} \] (and reverse)

- Learning: instability reinforces expectation rule; moves expectation in direction of most recent error.
  
  - Behavioral expectations: contrast with RE

- Conditions (1) and (2) \implies instability; does not depend on parameter values
A Harrod Collapse
Containing Downside Instability

- Autonomous source of demand
  \[ F_t = F_0 (1 + g^A)^t \]

- Stabilizes demand on downside. Key variable \( F_t / Y_{t-1} \) in law of motion
  - \( F_t / Y_{t-1} \) gets “large” as growth of \( Y_t \) falls below \( g^A \)

- Find \( Y' \) at minimum of cycle
  - Set \( E_g \) to zero and \( v=v^* \): standard Keynesian multiplier
  - \( Y' = F / [s - \delta v^*] \)
  - Denominator: propensity to save less “accelerator”
The “Floor” (f* = 0.01; tiny)
Interpreting the “Floor”

- Find $Y'$ at minimum of cycle

- Set $E_g$ to zero and $v=v^*$: get standard Keynesian multiplier result
  - $Y_t' = F_t / [ s - \delta v^*]$ (time dependent path)
  - Denominator: propensity to save less “accelerator”
Labor Constraints and the Ceiling

- Effective labor supply (productivity adjusted) grows exogenously at rate $g^*$ (simplest case); generates potential output $Y^*$
- If $AD_t > Y^*$, $Y_t = Y^*$
- Demand drives growth until system hits resource constraints
More Realistic Application

- Autonomous demand share 35%; limits downside volatility
- Capital-output ratio of 1.0 (2009 about 1.2)
- Random, uncorrelated shocks with standard deviation of 0.5%
- Growth path contained in corridor
One Realization (Random Shocks, f share 35%)
What is Important Here?

- No price adjustment / monetary policy mechanism to close “demand gap”
- Demand growth is the result of positive instability plus floor imposed by autonomous demand
- Simulations occasionally touch supply-constrained steady state, but \( Y^* \) path is typically unstable
- Demand is proximate constraint on output most of the time
Variation in Growth of F

- No need for F to grow at same rate as potential Y
- Below growth of supply => corridor widens
- Faster than supply => corridor goes to zero
  - Seems unrealistic: fluctuations do not seem to disappear
  - Autonomous spending rises faster than potential output
Possible Stable Steady-State with F

- Presence of F always bounds demand/output path away from zero; creates “floor”
- May create endogenous ceiling on demand
- In this case, growth path driven by autonomous demand + basic multiplier
- Explanation for stagnation in “growth phase” of cycle
  - In unstable model, positive growth accelerates until resource constraints bind
- Empirical relevance of two regimes; what leads to switch?
- Important implications for fiscal policy (current project)
  - Need F to grow at rate that maintains full employment
  - Austerity affects levels and growth rate
Effect of Large “F”

- Constrains demand path away from potential output
Extensions

- Price and interest rate adjustment
  - Prices probably not too interesting
  - Interest rates and saving / investment; monetary policy
- Endogenous productivity: from demand to supply
- Finance: Minsky fragility as “ceiling” (2007??), financial cleansing as floor
- Income distribution, consumption, household debt in fully dynamic context
  - Explore formal dynamics of the “Consumer Age”
Conclusion: Trivial, Intriguing, Profound?

- **Trivial:** neoclassical synthesis in new clothes? But ...
  - Fundamentally different adjustment mechanism
  - Full employment inherently unstable
  - Institutional links to downside containment
  - Possibility that demand never reaches potential path

- **Intriguing:** a truly different perspective. But ...
  - Upward instability of demand a robust empirical feature of modern capitalism?
  - Empirical role of autonomous demand in containment?

- **Profound:** A simple idea, but one that could change the way we think about growth.
Kaleckian Growth Model

- Autonomous investment function drives growth in K
  - Capacity utilization / animal spirits / distribution
  - Demand and growth

- Issues
  - Target capacity utilization as equilibrium result vs. behavioral concept
  - How to explain “moments” of near full employment?

- Useful, but explore different conception