Demand and Accumulation in Long-Run Capitalist Development: Unbalanced Growth and Crisis

Chapter 1 — Dissertation

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Agenda

Research Question and Hypothesis

Research question: Under persistent unbalanced growth ($\theta \neq 1$), how does class conflict shape the long-run evolution of accumulation, investment, and utilization?

Hypothesis:

- Balanced-growth closure requires $u \to 1$ and $\hat{Y}^p = \hat{K}$ ($\theta = 1$).
- When $\theta \neq 1$, dynamics are uneven and path-dependent; crises mark regime shifts until institutions Λ restructure profitability, demand, and capacity.

Method and Results

Method:

- Demand-led nonlinear system in (u, ϕ) with capacity law $\hat{Y}^p = \theta \hat{K}$.
- θ endogenized by distribution ω at given institutional regime Λ.
- Endogenous savings and open-economy leakages $s(\omega)$ and $m(\omega)$.
- Treat G, X as analytically exogenous for identification only.

Results:

- Provides a Marxist reformulation of the SSM reconciling it with harrodian instability.
- Crisis taxonomy: stagnation, partial crisis, accumulation–regime crisis.
- Maps separating policy stabilization from regime transformation $(\Lambda \to \Lambda')$.

Dual Definition of Utilization

Methodological convention

Normalize normal utilization $u^n = 1$.

Analytical definition

$u = \dfrac{Y}{Y^p}, \quad Y^p = BK$, where B is normal capital productivity $(\dfrac{Y^p}{K})$

At $u = 1$, the productivity drift satisfies $\hat{b} = (\theta - 1)\hat{k}$; utilization mediates demand and accumulation.

Utilization Typologies Across Traditions

- **Neoclassical:** factor substitution ensures convergence; u^n from cost minimization.
- **Neo-Kaleckian:** mark-up pricing, oligopolistic competition; strategic spare capacity and desired $(Y/K)^d$ (Steindl, 1952; Nikiforos2013)
- **Classical/Sraffian:** free competition, markets as sites of accumulation, long-period gravitation; reconciliation between effective u and desired or normal u^d via Kaldorian closure of balanced growth $\hat{y} = \hat{k}$ (Ciccone, 1986; Serrano, 2017).
- **Marxist Political Economy:** anarchic competition; markets as accumulation arenas; $u^n = 1$ anchors instability analysis (Shaikh, 2016; Basu, 2022).

Endogenous Savings, Consumption, and Imports

Consumption:

$$c(\omega) = c_\omega \, \omega + c_\pi \, (1 - \omega)$$

Savings:

$$s(\omega) = 1 - c(\omega) = \big(1 - c_\pi\big) - \big(c_\omega - c_\pi\big)\omega, \quad s'(\omega) < 0$$

Imports:

$$m(\omega) = m_\pi + \big(m_\omega - m_\pi\big)\omega$$

Effective leakage $s(\omega) + m(\omega)$ defines the external constraint.

Sraffian Supermultiplier (SSM)

Domain: $0 < \phi < s + m$.

$$\Phi(\phi) = \frac{\phi}{s + m - \phi}$$
$$\hat{y} = \Phi(\phi)\hat{\phi} + \hat{z}$$

- Short run:
  - Acknowledge that distribution changes marginal propensities $s(\omega), m(\omega)$, shifting Φ. However, the SSM circles around distributive conflict and focuses on marginal propensities $s = 1 - \dfrac{C}{Y}$ and $m = \dfrac{M}{Y}$
  - Capacity utilization changes: $\hat{u} = \hat{y} - \hat{k}$, induce investment share adjustments $\phi = \dfrac{I}{Y} = \gamma(u - 1)$, where 1 is a normalization of spare capacities parameter.
- Long run: $u \to 1 \Rightarrow \hat{y} = \hat{z}$.

Production, Mechanization, and Capacity Formation

Technology:

$$Y = \text{mín}\{AL,\, uBK\}, \qquad \rho \equiv \frac{Y}{K} = uB$$

Capacity building law ($\hat{k}$ is the only source of demand building productive capacities):

$$Y^p = K^{\theta(t)} \Rightarrow \hat{y}^p = \theta\,\hat{k}$$

Production, Mechanization, and Capacity Formation

Mechanization:

$$Q = \frac{K}{L}, \qquad \hat{q} = \hat{k} - \hat{l}$$

Labour Productivity as a Mechanization Function:

$$A = \frac{Y}{L}, \qquad \hat{a} = g(\hat{q}|\Lambda)$$

Hence, capital productivity at normal level:

$$B = \frac{A}{Q}, \qquad \hat{b} = g(\hat{q}|\Lambda) - \hat{q}$$

Normal Conditions of Production

Are such that there is no effects from changes in employment (Okun's Law):

$$\hat{u} = \beta\hat{\eta}$$

Hence, a A level corresponding at B requires $\hat{\eta} = 0$. Such that a mechanization function $g(\hat{q}|\Lambda)$ clean from aggregate demand effects. Is this an adequate assumption?

- Under a framework of anarchich competition it is!
- This setting portraits an efficient benchmark of capitalist mechanization.
- Nevetheless, capitalists are prone to inefficiencies by inducing mechanization throughout the business cycle looking at market conditions without identifying long-run structural tendencies, and cyclical dynamics.
- This behavior is explained because markets are *fetishied accumulation arenas*, where the capital logic subordinate workers and capitalist alike.

Optimal Mechanization and the Firm's Decision Rule

- Firms maximize incremental profitability per-mechanization growth rate:

$$\max_{\hat{q}} \ \hat{r} = \hat{a} - (1-\omega)\hat{q}$$

- Productivity gains follow $\hat{a} = g(\hat{q}, \omega \mid \Lambda)$ under institutional state Λ.
- First-order condition for interior solution:

$$g_{\hat{q}}(\hat{q}^*(\omega \mid \Lambda), \omega \mid \Lambda) = 1 - \omega.$$

- Interpretation: optimal mechanization equates marginal gain of mechanization to distributive pressure $(1-\omega)$.
- Stronger labor power (higher ω) lowers $(1-\omega)$, pushing firms toward higher mechanization intensity.

A digression on Non-Linearities

- A seldom considered identity in growth and distribution debates, is the fact that $\pi = 1 - \omega$ and ω can be re-writen as a non-linear function of the rate of exploitation.

$$e = \frac{1-\omega}{\omega}$$
$$\omega = \frac{1}{1+e}$$
$$1-\omega = \frac{e}{1+e}$$

- Hence, the first-order condition can be expressed as:

$$g_{\hat{q}}(\hat{q}^*(e \mid \Lambda), e \mid \Lambda) = \frac{e}{1+e}$$

- Is straightforward to demostrate that:

$$f^{(n)}(e) = (-1)^{n+1} \frac{n!}{(1+e)^{n+1}}$$

Class Conflict and Institutional Drift

Distributional dynamics:

$$\hat{\omega} = \Omega(\omega \mid \Lambda), \qquad \frac{\partial \Omega}{\partial \omega} > 0$$

- Positive feedback yields polarization and path dependence.
- Λ respresents institutional state here and at $\theta(\omega|\Lambda)$.
- Acc Reg.: $\mathcal{R} \equiv \{\theta(\omega \mid \Lambda), \Omega(\omega \mid \Lambda), \gamma, \hat{z}, s(\omega), m(\omega), \Lambda\}$.
- Local dynamics: fix R, study (u, ϕ) at a given Λ institutional compromise. Regime change: $\Lambda \to \Lambda'$ might shifts (in)stability boundaries.

Dynamic System of the MSM

- States: utilization u, investment share ϕ; parameters $\gamma > 0$, $\theta > 0$, $\hat{z}$.
- Laws of motion:

$$\hat{\phi} = \hat{u}(\gamma u - 1) + (1 - \theta)\gamma(u - 1), \quad \hat{u} = \hat{z} + \frac{\phi}{s + m - \phi}\hat{\phi} - \theta\gamma(u - 1)$$

- Admissible set: $\mathcal{A} = \{(u, \phi) : 0 < \phi < s + m\}$.
- $\Phi(\phi) = \dfrac{\phi}{s - \phi + m}$ well defined iff $0 < \phi < s + m$.

Long-Run Geometry: Fixed Points and Types

- Let $\delta = \hat{z}/(\gamma\theta)$; fixed points: $u^*_\pm = 1 \pm |\delta|$ (with feasibility conditions).
- On $\mathcal{A}$ equilibria are nodes or saddles only.
- Unbalanced growth tech:

$$\theta > 1 \Rightarrow u^*_- \text{ saddle (under-accumulation tendency)}$$
$$0 < \theta < 1 \Rightarrow u^*_+ \text{ saddle (over-accumulation tendency)}$$

- Zero-trace cuts split slow vs fast divergence by regime.

Harrodian Slope and Marxist Super Multiplier

- Local slope: $\Gamma(u, \phi; \theta, \gamma, \hat{z}) = \frac{d\hat{\phi}}{d\hat{u}}$.
- Feasible signs: $\Gamma > 0$ (Harrodian instability) or $\Gamma < 0$ (Harrodian reversal).
- MSM definition:

$$\mathrm{MSM}(u, \phi; \mathcal{R}) = \Phi(\phi)\,\Gamma(u, \phi), \qquad \mathrm{sgn}(\mathrm{MSM}) = \mathrm{sgn}(\Gamma)$$

No Balanced Growth (with $\theta \neq 1$, $\hat{z} \neq 0$)

- Steady state needs $\hat{u} = \hat{\phi} = 0$.
- From $\hat{u}$-equation: $u - 1 = \hat{z}/(\theta\gamma) \neq 0$ if $\hat{z} \neq 0$.
- From $\hat{\phi}$-equation: $(1-\theta)\gamma(u-1) = 0 \Rightarrow \theta = 1$.
- Hence with endogenous $\theta \neq 1$ and $\hat{z} \neq 0$ there is no interior steady state.
- Conclusion: standard SSM balanced-growth result breaks once Harrodian feedback is active, unless $\theta = 1$, but in the model becomes a knife-edge.

Taxonomy: Stagnation, Crisis, Structural Crisis

- Stagnation tendencies: $\theta > 1$ (under-accumulation) vs $0 < \theta < 1$ (over-accumulation).
- Partial crisis: realized divergence with $\mathrm{MSM} > 1$ fixable within $\Lambda \to \Lambda'$.
- Structural crisis: no nearby Λ' yields $\mathrm{MSM} \leq 1$ near the saddle; regime change is required to stabilize the system.
- Orthogonality of realization and structure:
  - Structure $S(\theta)$ selects which branch is saddle.
  - Realization: crisis iff $\mathrm{MSM}^* > 1$ at the saddle; damped if < 1.

The Marxist Supermultiplier (MSM): An Unbalanced Growth Framework

- Reformulates the Sraffian supermultiplier on Marxian grounds—profit-driven firms, endogenous technique, and institution-conditioned instability.
- Rejects balanced growth: instability is the normal condition of accumulation.
- Defines endgenous unbalanced growth $\theta(\omega \mid \Lambda)$ as the bridge linking technology, distribution, and institutions.
- Provides a taxonomy of stagnation, crisis, and regime crisis—clarifying when macro policy suffices and when institutional change ($\Lambda \to \Lambda'$) is required.