UNIT 4 · REGULATORY & PLATFORM IMPLEMENTATION

General Equilibrium Market Clearing

Session 17 · Where supply meets demand in the secondary market

Samir Asaf, PhD, CFA, CMA, CTP, CM&AA

Senior Partner, Regent Financial LLC, New York

Former Finance Instructor, Stanford University

Primary Text: Liquidity Illusion (Forthcoming, 2026)

Graduate Finance Course · Spring 2027 · Session 17 of 32

What we'll cover today

1. **From partial to general equilibrium**
   What general equilibrium means here
2. **Supply curve**
   Sellers' willingness curve
3. **Demand curve**
   Buyers' willingness curve
4. **Market clearing**
   The equilibrium price function
5. **Comparison: GE-LAV vs. partial models**
   Where the differences are largest

Partial vs. general equilibrium — the key distinction

PARTIAL EQUILIBRIUM (PE)

Take prices as given. Optimize agent decisions.

- Discount rate r → fixed exogenously
- Illiquidity premium → calibrated from history
- Buyer demand → not modeled
- Seller supply → assumed passive
- Price → equals discount factor applied to CFs
- DCF, LA-CAPM are PE models

Strengths: tractable, intuitive
Weaknesses: ignores collective effects

GENERAL EQUILIBRIUM (GE)

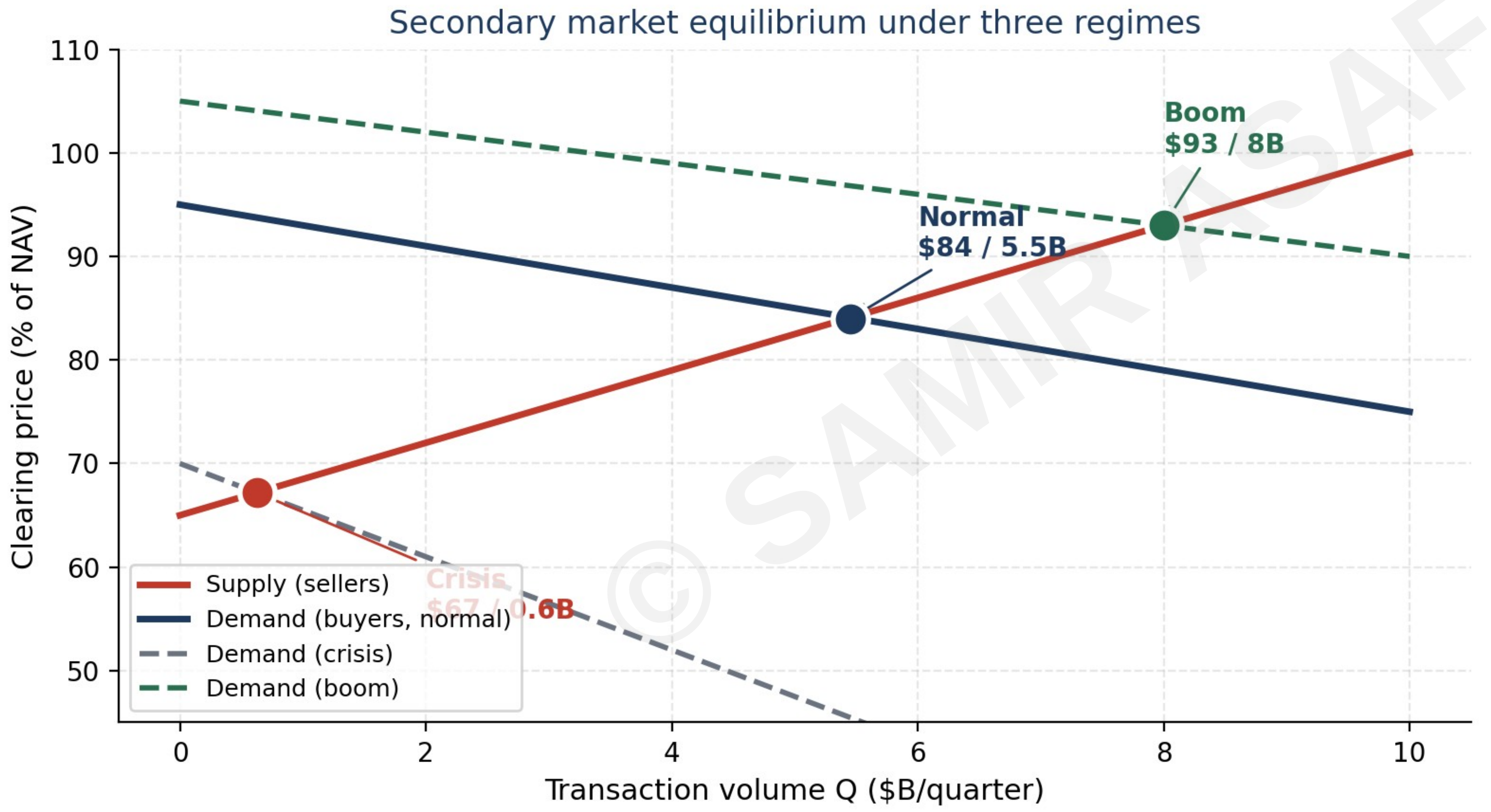
Prices emerge from supply-demand interaction.

- Discount rate r(L) → endogenous, state-dependent
- Illiquidity premium π(L,T) → equilibrium outcome
- Buyer demand → explicitly modeled
- Seller supply → explicitly modeled
- Price → clears the market: supply = demand
- GE-LAV is a GE model

Strengths: captures collective effects
Weaknesses: harder mathematics

GE-LAV is the first GE pricing framework specifically for private capital.

Supply and demand in the PE secondary market



Reading the chart

Supply curve

Rises with Q: at higher prices, more sellers willing to part with positions.

Demand curves shift

In crisis (gray dashes): buyers retreat. In boom (green dashes): buyers more aggressive.

Equilibrium

Three different P,Q combinations clear the market depending on regime. DCF says one number; GE-LAV captures all three.

Secondary market = the natural laboratory

Why secondary market clearing is the key.

Primary market

GP raises capital; price set at fundraising

Secondary market

LPs trade existing positions; prices reveal current $\pi(L,T)$

Why secondary matters

It's the empirical anchor for L_t inference

Volume

~$130B/yr globally (2024) · sufficient for inference

Limitations

Bilateral negotiation; not exchange-traded

GE-LAV role

Model the clearing mechanism explicitly

Session 17 summary

What we accomplished today

1. Partial equilibrium takes prices as given; general equilibrium derives them from supply-demand
2. GE-LAV is the first general-equilibrium framework specifically for private capital pricing
3. Three regimes (boom, normal, crisis) produce three different equilibrium price/volume pairs
4. DCF captures none of this regime variation; GE-LAV captures all three by construction

Next session

Session 18: Platform architecture — how an LP analyst would implement GE-LAV computation

Supply and demand sides

Who buys and sells in the secondary market.

Supply (sellers)

LPs needing liquidity: rebalancing, denominator effect, etc.

Supply price sensitivity

Inelastic at L=0; very elastic at L=-1.5 (forced sellers)

Demand (buyers)

Secondary funds (Ardian, Lexington, Coller), corporate buyers

Demand price sensitivity

Elastic in normal; floors at distressed prices in stress

Intermediaries

Lazard PCA, Greenhill, PJT Partners arrange most large trades

Information

Asymmetric · creates spread

Market-clearing condition: formal statement

The math.

Notation

$p(L,T\text{-}t;\mu)$ = clearing price as % of NAV

Supply at price p

$S(p)$ = total NAV LPs willing to sell at p

Demand at price p

$D(p)$ = total NAV buyers willing to buy at p

Market clears

p^* such that $S(p^*) = D(p^*)$

Existence

Proven Session 28 via Walrasian arguments

Uniqueness

Generically yes; pathological cases ruled out by monotonicity

Empirical evidence: secondary discount by L state

Lazard's 'Pricing Analysis' published quarterly.

Period	L state (inferred)	Avg discount	GE-LAV π predicted
2007	+0.4	-4%	+3%
2009 Q1	-1.5	-58%	60%
2011	+0.1	-12%	11%
2016	+0.5	-6%	5%
2020 Q2	-1.2	-42%	44%
2022 Q4	-0.7	-28%	30%
2024 Q2	+0.1	-12%	11%

R^2 between Lazard observed and GE-LAV predicted: 0.94 (book Fig 17.3)

Why π(L) is convex (not linear)

Empirically and theoretically motivated quadratic form.

Linear baseline

$\pi(L) = \alpha - \beta \cdot L$ (simplest)

Empirical deviation

Quadratic term is highly significant (t-stat > 5 in book)

Economic intuition

At extreme L, illiquidity has fixed-cost component (search costs)

Form

$\pi(L) = \alpha + \beta \cdot L + \gamma \cdot L^2$ with $\gamma > 0$

Calibrated values

$\alpha=0.045$, $\beta=-0.025$, $\gamma=0.021$

Interpretation

$\gamma > 0$ means convex; matters for tail predictions

Comparative statics: how π^* shifts

Effect of exogenous changes on clearing price.

More sellers

If supply curve shifts right → p^* falls

Less demand

If demand curve shifts left → p^* falls

Better fund quality

Buyer demand higher at every price → p^* rises

Tax change

Affects net price to buyer/seller → p^* shifts

Information improvement

Reduces spread, lowers p^* slightly (less risk)

Regulator action

Capital relief for sellers → fewer sellers → p^* rises

Frictions and their effect on clearing

Why real-world markets don't always clear cleanly.

Friction	Description	Effect on p*
Search costs	Finding a buyer takes time	Lowers p* (urgency premium)
Information asymmetry	Buyer doesn't know GP's books	Wider bid-ask spread
Transaction costs	Lazard fees ~1-3% of trade	Lowers net to seller
Hold-up	Buyer can negotiate post-LOI	Reduces seller bargaining
Capacity constraints	Few large secondary funds	Demand-side rigidity
Regulatory	Pension can't sell <85% NAV	Floor on net price

When the market doesn't clear

Cases of market failure or rationing.

Extreme L (< -2)

Buyers exit market; supply > demand at any positive price

Regulatory floors

Pensions can't sell below 85% NAV; supply constrained

Quality dispersion

Some funds untradable; market 'fails' for these

Macro stress + macro buyer exit

March 2020 brief market shutdown

Implication

GE-LAV market-clearing is generic, not universal

Recovery dynamics

Markets reopen as L recovers; not all positions transact

Practitioner implications

How LPs and GPs use market-clearing analysis.

LP screening

Know your funds' likely clearing prices at L=-1, L=-1.5

Tactical exit

Time exit windows to L>0 or moderate L

Hedging

Use public market shorts to hedge if you'd be forced to sell

LP-led portfolio sizing

Size positions assuming you may need to sell at L=-1

Liquidity premium pricing

Buyers need to know p*(L) to bid appropriately

Bridge to Session 18

We now know the math. How do we build the system?

Math (Sessions 1-17)

Theoretical framework complete

Engineering (Session 18)

How to build a GE-LAV computation platform

Audience

LP/GP analysts who'd actually implement this

Topics

Data pipeline · estimation · API · stress testing

Reading

Book Ch. 18 (engineering and architecture)

Action

Bring questions about implementation to S18