In a Nutshell

- In a liquidity trap with firms’ high hurdle rates, neither an improved net investment return nor a lower real interest rate alone warrants increased investment.
- For a given real interest rate, there is a threshold for low investment return that bifurcates the interest-rate sensitivity of investment and thus produces a kink in the aggregate demand curve (Figs. 1 and 2).
- If investment return is below its threshold, QE helps stimulate investment by reducing financial frictions and raising inflation expectations (Fig. 3).
- If investment return exceeds its threshold, QE could backfire as a further lower real interest rate tends to reduce firms’ propensity to invest (Fig. 4); in contrast, it is *laissez faire* that can stimulate investment via falling inflation rate and improved investment return (Figs. 5 and 6).

Research Questions

- Does a lower real interest rate necessarily increase corporate physical capital investment?
- Would the aggregate demand curve necessarily be upward sloping at the zero lower bound of interest rate so that QE is the only cure of deflationary spiral?
- In a liquidity trap, what condition determines the relative effectiveness of QE versus *laissez faire* in stimulating capital investment and aggregate demand?

A Firm’s Investment Problem

- Take a risky physical investment project that promises the firm an expected rate of return $(\theta)$ versus its certainty equivalent financial investment that warrants a return per unit of capital $s(r)$, $(s’<0)$.
- Need to lever either project by borrowing a unit of capital at the market real interest rate, $r$.
- The relative investment return $\frac{\theta-r}{s(r)-r}$ plus risk preference $(b_n)$ determine a firm’s marginal propensity to invest in physical capital:

$$l'(r) = b_k \left( \frac{\theta-r}{s(r)-r} \right) > 0, \text{ if } \theta > 1 \text{ (zones C,D,E)}; \text{ or if } \theta r_1(\theta) \text{ when } \theta \leq 1 \text{ (zone B)}; \text{ or if } \theta > r_1(\theta) \text{ when } \theta \leq 1 \text{ (zone A)}.$$

Conclusions

- In a liquidity trap, corporate investment depends on firms’ expected net investment return relative to its “certainty equivalent”.
- Neither an improved net investment return nor a lower real interest rate alone warrants increased investment if a risk-averse firm’s hurdle rate is sufficiently high.
- In particular, a lower real interest rate is neither sufficient nor necessary condition for investment.
- It is the increasing boundary for real interest and low investment return that bifurcates the interest-rate sensitivity of investment and produces a kink in the aggregate demand curve.
- AD curve is not necessarily upward sloping at the zero lower bound of interest rate.
- While QE can be effectively expansionary when investment return is below its boundary value and thus the AD curve is upward sloping, QE could backfire under the opposite condition; in this case, it is *laissez faire* instead that is conducive to higher real interest rate and investment return that take firms out of their “safe haven” and stimulate investment.