

MINSKY'S TWO-PRICE THEORY OF INVESTMENT: UNCERTAINTY, FINANCIAL STRUCTURE, AND ARBITRAGE BETWEEN NEW AND EXISTING CAPITAL ASSETS

Eric Tymoigne, Lewis & Clark College
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Question 1

- What is investment?

Investment = addition to the quantity of physical/capital assets

$$K_t = K_{t-1} + O_{It}$$

K: stock of existing capital assets (old capital assets)

O_{It} : investment good output (new capital asset) (to simplify let's assume that all investment is net investment)

Question 2

- What determines the level of investment? i.e. When entrepreneurs want to increase their production capacities, how do they choose between buying new capital assets (investment) or old capital assets (mergers, acquisitions)?

Minsky's answer: it depends on the relationship between the demand price and the supply price of capital assets

The demand price of capital assets (P_{Id}) is the price that entrepreneurs are willing to pay for acquiring (old or new) capital assets.

The supply price of capital assets (P_{Is}) is the replacement cost of *new* capital assets.

These two prices are determined very differently.

Question 3



- What determines the relationship between the demand price of capital assets and the supply price of capital assets?

Minsky's answer: it depends on:

- State of expectations of borrowers and lenders
- State of expectation of financial-market participants
- Views about normal/acceptable/proper funding structures
- Cost of production of investment goods and mark-up over cost.

Keynes

- “If Q_r is the prospective yield from an asset at time r , and d_r is the present value of £1 deferred r years at the current rate of interest, $SQ_r d_r$ is the demand price of the investment; and investment will be carried to the point where $SQ_r d_r$ becomes equal to the supply price of the investment as defined above. If, on the other hand, $SQ_r d_r$ falls short of the supply price, there will be no current investment in the asset in question” (chapter 11)
- “The daily revaluations of the Stock Exchange, though they are primarily made to facilitate transfers of old investments between one individual and another, inevitably exert a decisive influence on the rate of current investment. For there is no sense in building up a new enterprise at a cost greater than that at which a similar existing enterprise can be purchased; whilst there is an inducement to spend on a new project what may seem an extravagant sum, if it can be floated off on the Stock Exchange at an immediate profit. Thus certain classes of investment are governed by the average expectation of those who deal on the Stock Exchange as revealed in the price of shares, rather than by the genuine expectations of the professional entrepreneur.” (chapter 12)
- “Now those assets of which the normal supply-price is less than the demand-price will be newly produced” (Chapter 17)

Keynes



- “Two types of risk affect the volume of investment which have not commonly been distinguished, but which it is important to distinguish. The first is the entrepreneur’s or borrower’s risk and arises out of doubts in his own mind as to the probability of his actually earning the prospective yield for which he hopes. If a man is venturing his own money, this is the only risk which is relevant. But where a system of borrowing and lending exists, by which I mean the granting of loans with a margin of real or personal security, a second type of risk is relevant which we may call the lender’s risk.” (Chapter 11)

Fisher



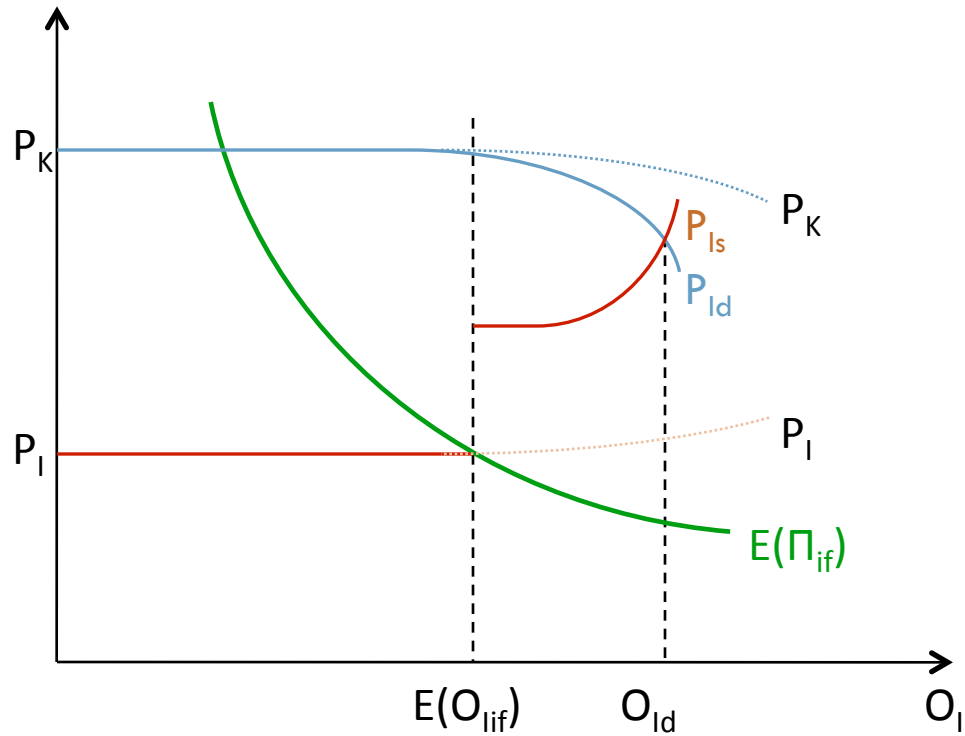
Over-indebtedness means simply that debts are out-of-line, too big relatively to other economic factors. If the debts are out-of-line relatively to only a few unimportant factors, little harm may result. The great disturbances come when the debts are decidedly out-of-line with practically everything—including assets, income, gold and liquidities (i. e., quickness or slowness of assets and liabilities.)

(Fisher 1932, 11)

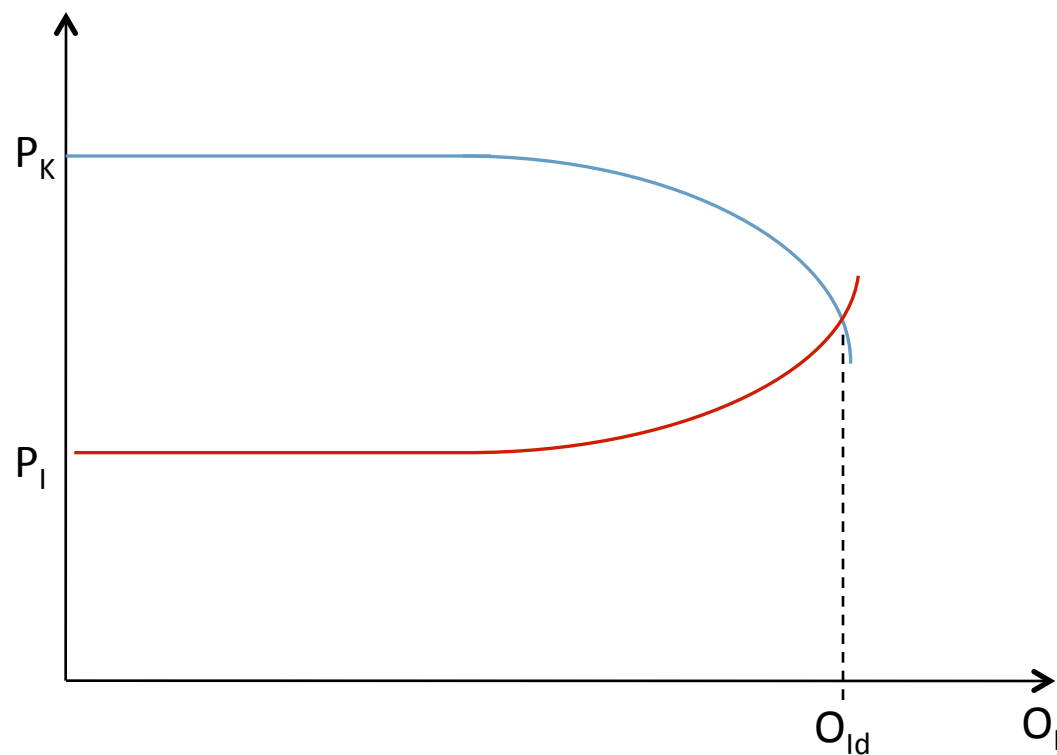
Minsky

- Let's combine Keynes and Fisher by including the role of:
 - ▣ The price of old capital (P_K) as indirectly valued by financial markets, mergers and acquisitions
 - ▣ The price at which investment goods are sold (P_I)
 - ▣ The lender's risk: views about potential default
 - ▣ The borrower's/entrepreneur's risk: views about potential failure of a project
 - ▣ Overindentedness: The role of external funding (amount of leverage) and the views regarding proper funding structure of investment (acceptable amount of leverage).
 - ▣ The state of expectation about prospective yield and internal funds ($E(\Pi_{if})$)

Minsky's Diagram



Tobin's q



$$q = P_K/P_I$$

If $P_K/P_I > 1$ then $\Delta K = O_{Id} > 0$ (investment occurs)

If $P_K/P_I < 1$ then $\Delta K = 0$ (Redistribution of capital through mergers/acquisitions)

Tobin's q

- P_K and P_I come from two different set of prices and behave very differently
 - ▣ First set: asset/stock prices, i.e. prices of existing financial (P_F) and capital assets (P_K). They are influenced by:
 - Expectation of future profits
 - Liquidity preference
 - Amount of liquid assets relative to illiquid assets
 - ▣ Second set: output/flow prices, i.e. prices of newly produced commodities, investment goods (P_I) and consumption goods (P_C).

$$P_I = (1 + \text{mark up}) \times \text{unit cost}$$

Tobin's q

- As investment goes up:
 - ▣ P_K goes down because of market saturation (expected monetary profits go down)
 - ▣ P_I goes up because of pressures on unit cost as more investment occurs.
- When $P_K = P_I$, entrepreneurs are indifferent between buying new or old capital assets; therefore, we get the level of investment output demanded (O_{Id}) and the nominal level of investment ($P_I O_{Id}$)

Minsky's Criticism



- Tobin's explanation does not go far enough because it misses the role of
 - uncertainty
 - the funding structure of investment (i.e. the proportion of external funds uses to buy investment goods)

Expected Funding Structure: Internal Funding

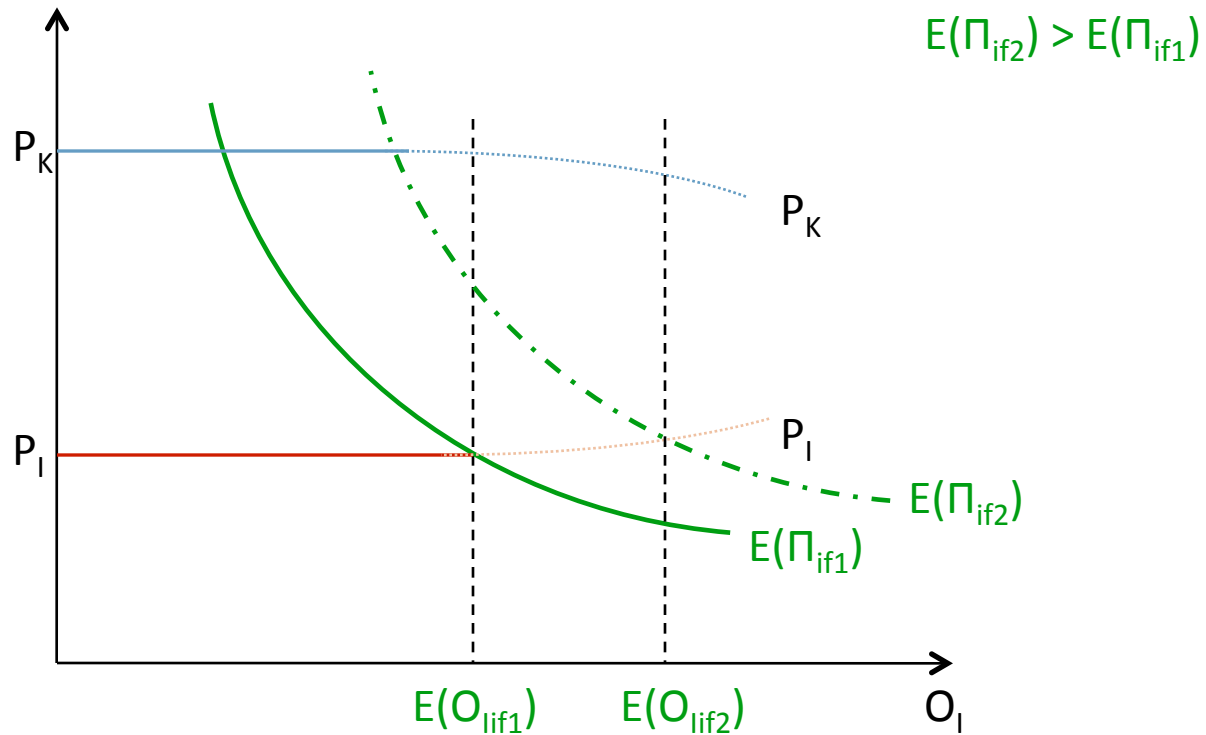
- The amount of expected internal funds $E(\Pi_{if})$ determines the dollar amount expected to be available to buy investment goods:

$$P_I E(O_{if}) - E(\Pi_{if}) = 0$$

Rearranging we get the expected amount of investment output that will be internally funded:

$$E(O_{if}) = E(\Pi_{if})/P_I$$

Expected Funding Structure: Internal Funding



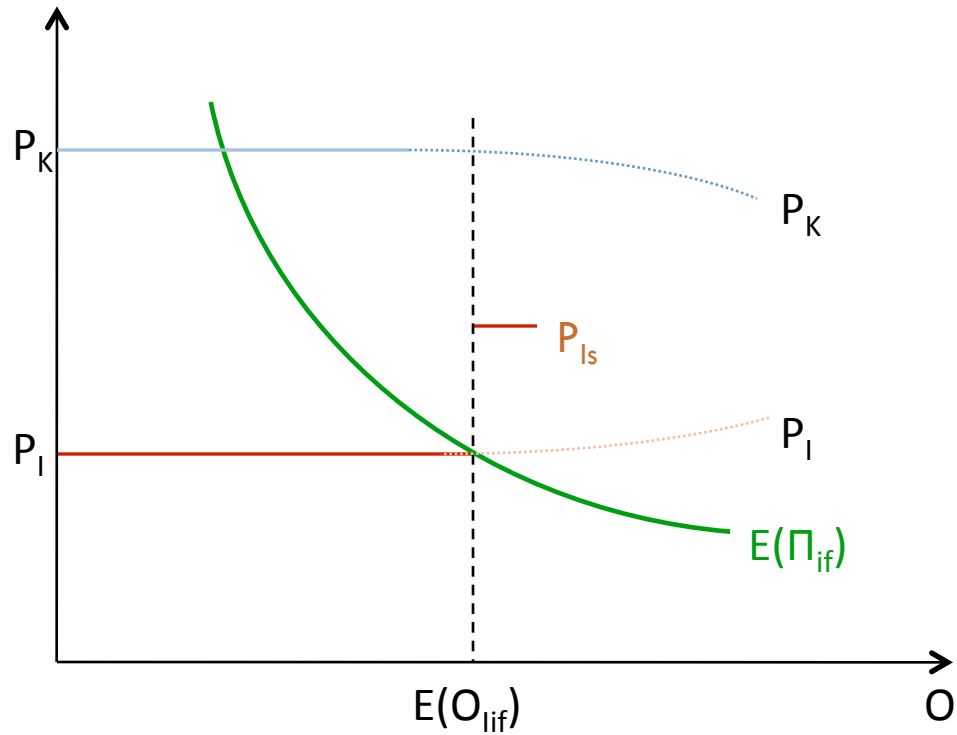
If $O_{ld} \leq E(O_{lif})$ it is not expected that external funding will be needed.

Expected Funding Structure: External Funding

- If $O_{ld} > E(O_{lif})$ it is expected that external funds (i.e. borrowing) will be necessary to buy investment goods.
- In this case, there are additional elements that affect the level of investment.
 - ▣ The replacement cost of new capital assets includes the discounted value of debt service payments.

$$P_{ls} = P_l + \text{unit cost of external funds}$$

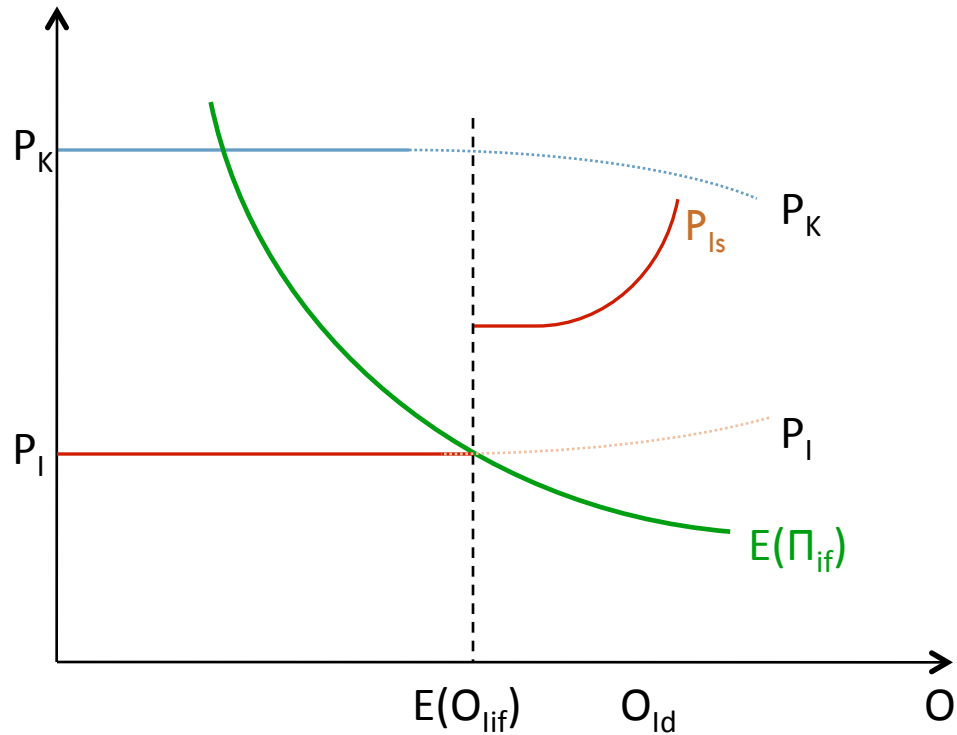
Expected Funding Structure: External Funding



Uncertainty and acceptable funding structure

- Expected funding structure is compared to what is supposed to be a “normal”/ “acceptable” funding structure. This has a strong influence on:
 - ▣ The lender’s risk: as investment increases expected external funding grows relative to the norm so bankers become more worried about credit risk. As a consequence the monetary *and non-monetary* cost of external funds goes up (higher interest rates, lower maturity, more stringent covenants) => P_{Is} goes up

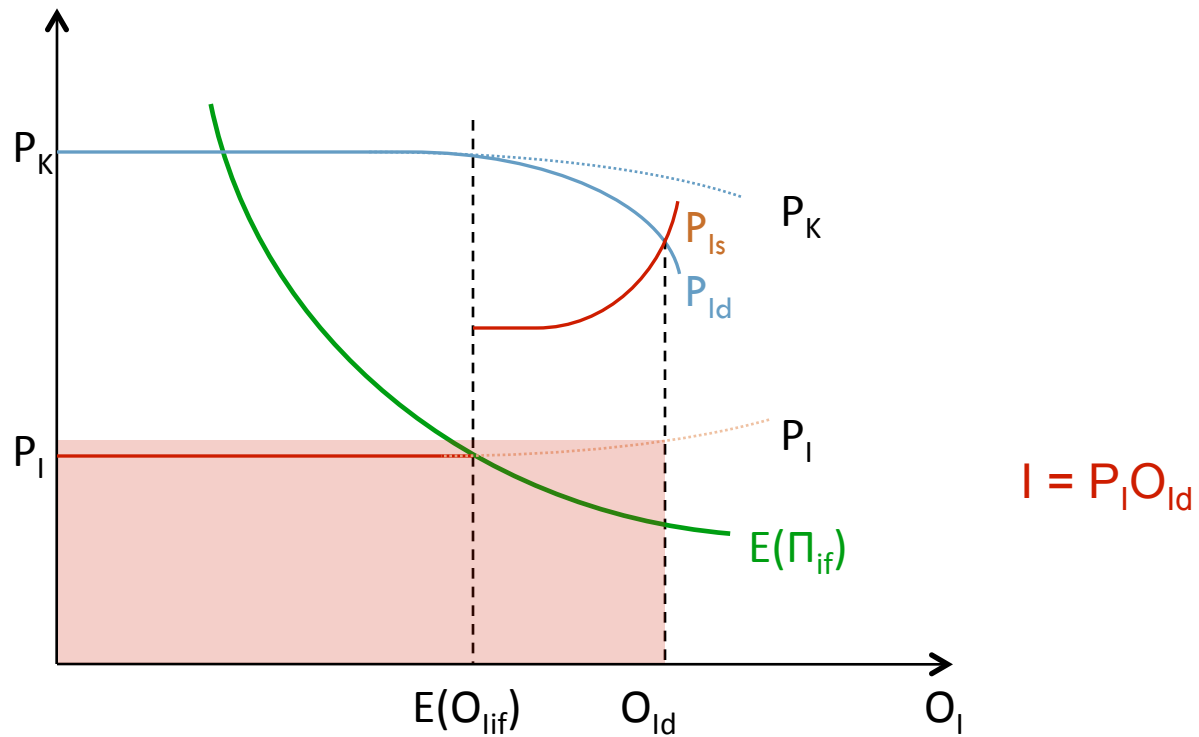
Uncertainty and acceptable funding structure



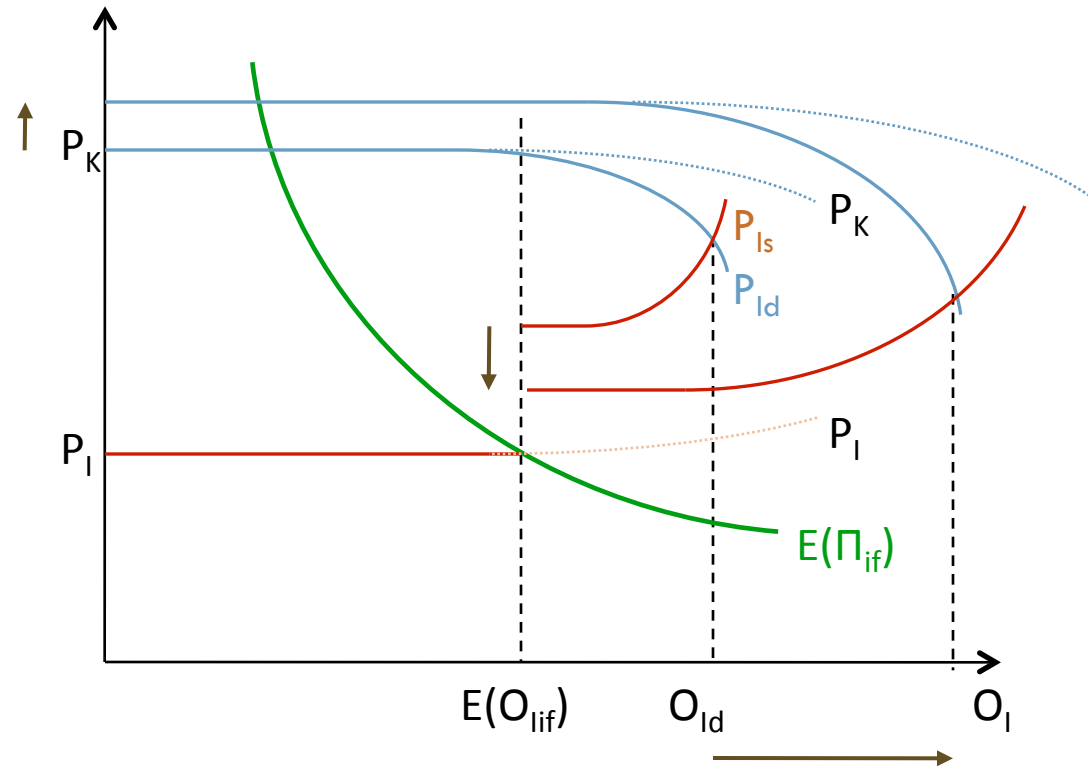
Uncertainty and acceptable funding structure

- The borrower's risk: as investment goes up and borrowing grows, entrepreneurs become more worried about potential default. The borrower's risk reinforces the entrepreneur's risk. The latter reflects the doubt that forms in the mind of entrepreneurs about the viability of investment as the latter goes up. Entrepreneur's risk may grow before external funding is needed. => entrepreneurs take the price of old capital assets as a point of reference and discount it to determine the price they are willing to pay for additional investment goods
- As investment goes up, P_{id} goes down because of the discounts induced by the entrepreneur's risk and borrower's risk.

Level of real and nominal investment

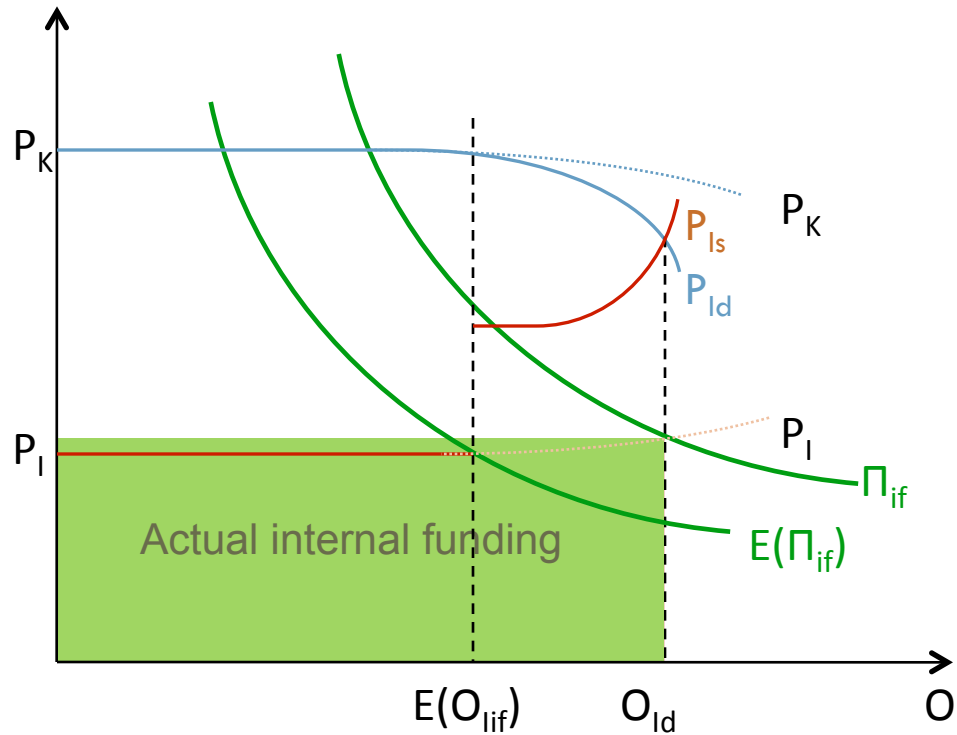


Effect of higher optimism or financial innovation



Higher optimism raises the state of expectations $\Rightarrow P_K$ goes up, borrower's risk goes down (P_{ld} flatter), lender's risk goes down (P_{ls} flatter)

Expected and Actual Funding Structure



$$P_I O_{Id} - (E(\Pi_{if}) + E(\Delta L_I)) = 0$$

$$P_I O_{Id} - \Pi_{if} = 0$$

Implications

- The availability of a greater amount of internal funds compared to what was expected boosts the state of expectations of borrowers, lenders and financial-market participants, which further promotes investment.
- At the same time more macroeconomic investment leads to more macroeconomic internal funds given everything else (Kalecki equation of macroeconomic monetary profit): $\Pi = P_1 O_1 + DEF$. As a consequence, some entrepreneurs earn more internal funds than expected.
- Investment is a highly erratic macroeconomic variable
- The analysis can be expended to other decisions than investment: consumption, financial placement.