Financial Markets and Monetary Policy
Walsh Chapter 10
1 Interest Rates

- Price level indeterminacy with interest rate peg
  
  - Model
    
    * Aggregate Supply
      
      \[ y_t = y^c + a (p_t - E_{t-1} p_t) + e_t \]
    
    * Aggregate Demand
      
      \[ y_t = \alpha_0 - \alpha_1 [i_t - E_t (p_{t+1} - p_t)] + u_t \]
    
    * Money Market Equilibrium
      
      \[ m_t - p_t = y_t - c_i t + v_t \]
* Nominal interest rate (Fisher relation)

\[ i_t = r_t + E_t (p_{t+1} - p_t) \]

* Interest rate rule: central bank pegs interest at fixed target

\[ i_t = i^T \]

- Money demand is no longer relevant because central bank must adjust money supply to set interest at target
- Price appears only as a price surprise or as an expected rate of change
- Any price level consistent with targeted expected rate of change and with expected price is an equilibrium
• Multiply all price terms by a constant, multiplying money by the same constant to keep \( i \) fixed – nothing changes

• Price level is indeterminate

• Money supply is indeterminate

* Can write system in inflation, instead of price

\[
y_t = y^c + a (\pi_t - E_{t-1} \pi_t) + e_t
\]

\[
y_t = \alpha_0 - \alpha_1 [i_t - E_t (p_{t+1} - p_t)] + u_t
\]

\[
i^T = r_t + E_t \pi_{t+1}
\]

• Since price does not appear, it is not determined
- If \( i^T \) adjusts to expected inflation, many solutions for inflation, depending on \( E_t \pi_{t+1} \) – issue of multiple equilibrium since inflation is in system

- If \( i^T \) is fixed, then inflation is determined, but not the price level

* Bring monetary aggregates back and price becomes determinate

\[
m_t = \mu_0 + m_{t-1} + \mu_1 (i_t - i^T)
\]

- Use money demand to determine price

- Money and price are both \( I(1) \)

- Alternative rule can leave money and price trend stationary

\[
m_t = \mu' + \mu_0 t + \mu_1 (i_t - i^T)
\]
• Underlying behavior of money not determined by target for the interest rate alone

• When add back underlying behavior of money used to target interest rate, money supply and price become determinate

• Interest rate pegs under cash-in-advance (Carlstrom and Fuerst)
  
  – Model
    
    * Euler equation with cash-in-advance
      \[
      \frac{u_{ct}}{1 + i_t} = \beta E_t R_t \frac{u_{ct+1}}{1 + i_{t+1}}
      \]
    
    * Labor-leisure choice
      \[
      \frac{u_{lt}}{u_{ct}} = \frac{MPL_t}{1 + i_t}
      \]
* Gross return on capital

\[ R_t = 1 + E_t M P K_{t+1} \]

* Cash-in-advance

\[ m_t = \frac{M_t}{P_t} = c_t \]

* Fisher equation (definition of nominal interest rate)

\[ 1 + i_{t+1} = E_t \frac{R_t P_{t+1}}{P_t} \]

– The model under an interest rate peg can replicate equilibrium in a real non-monetary model

* Under fixed interest rate, first equation is identical to counterpart in a non-monetary model
* Labor-leisure choice has extra interest rate term

* If labor is inelastic, lose labor-leisure choice

* Interest rate peg eliminates distortionary effects of inflation tax, improving welfare

  - Inflation and the money growth process are determinate under an interest rate peg

* Inflation must satisfy

\[ E_t \frac{R_t P_{t+1}}{P_t} = 1 + \bar{i} \]

* Nominal money must satisfy

\[ M_t = P_t c_t \]
* If utility is logarithmic, then Euler equation combined with cash-in-advance yields

\[
\frac{1}{c_t} = \frac{P_t}{M_t} = \beta E_t R_t \left( \frac{P_{t+1}}{M_{t+1}} \right)
\]

· Rearranging yields

\[
1 = \beta E_t R_t \left( \frac{P_{t+1}}{P_t} \frac{M_t}{M_{t+1}} \right)
\]

· With inflation determined above, money growth is also determined

· However, neither \( P \) nor \( M \) are determined

· If \( P_t \) is pre-determined, then equilibrium nominal and real money supply are determinate
- Interest rate peg can lead to same equilibrium as real model (if labor is inelastic) and to determinacy

- Liquidity traps
  
  - Euler equation evaluated at steady state
    
    \[ \frac{P_t (1 + i_t)}{P_{t+1}} = \frac{u_{ct}}{\beta u_{ct+1}} = \frac{1}{\beta} \]
    
    * Linearize
      
      \[ \pi_{t+1} = i_t \]

  - Taylor Rule
    
    \[ i_t = \pi^* + \delta (i_t) [\pi_t - \pi^*] \]
where $\delta (i_t) > 1$ for $i_t$ substantially above zero, but $\delta (i_t) = 0$ once $i_t = 0$

- Combining

$$\pi_{t+1} = \pi^* + \delta (i_t) [\pi_t - \pi^*]$$

- Model is unstable for high values of inflation and interest

$$\frac{\partial \pi_{t+1}}{\partial \pi_t} = \delta (i_t) > 1 \quad \text{large } i_t$$

but becomes stable for low values

$$\frac{\partial \pi_{t+1}}{\partial \pi_t} = \delta (i_t) < 1 \quad \text{small and zero } i_t$$
- Two equilibria
  - Unstable equilibrium with large inflation at $\pi^*$
  - Stable equilibrium with negative inflation at $i_t = 0$: a liquidity trap
  - Nothing to assure that we reach the positive inflation equilibrium

- Ways to get out of a liquidity trap
  - Non-Ricardian fiscal policy and increase present value future deficits
    - The surplus could fall and debt rise whenever inflation became very low
  - Quantitative easing and put real balances into consumption equation (OLG model)
* Raise expected future inflation
  - Promise to depreciate exchange rate in future
  - Price level target, so that as prices fall inflation necessary to reach price target increases, raising expected inflation
  - Raise inflation target temporarily
• Term structure

- Price of a two-year discount bond

\[ P_{2t} = \frac{\text{face value}}{(1 + i_t)(1 + i^e_{t+1})} \]

- Arbitrage - Will the investor prefer the two year bond above or two one year bonds?

* For every dollar you put in a two year bond, get \( \frac{1}{P_{2t}} \) two year bonds. At the end of the first year, now you have \( \frac{1}{P_{2t}} \) one year bonds valued at \( P^e_{1t+1} \) for a total value of \( \frac{P^e_{1t+1}}{P_{2t}} \).

* For every dollar you put in a one year bond, get \( 1 + i_t \).
* Which do you prefer in the first year? Arbitrage requires

\[ 1 + \hat{i}_t = \frac{P_{1t+1}}{P_{2t}} \]

- Yield to maturity on an n-year bond or equivalently the n-year interest rate is defined as that constant annual interest rate that makes the bond price today equal to the present value of future payments on the bond.

* What is the yield to maturity on a two year bond?

* Definition of yield to maturity (ignoring Jensen’s inequality problems)

\[
\frac{\text{face value}}{(1 + \hat{i}_t) (1 + \hat{i}_{t+1})} = \frac{\text{face value}}{(1 + \hat{i}_{2t})^2}
\]
Rearranging yields

\[ 1 + 2i_{2t} + i_{2t}^2 = 1 + i_t + i_{t+1} + i_t i_{t+1} \]

\[ i_{2t} \approx \frac{1}{2} (i_t + i_{t+1}) \]

* In general, for \( n \)-period bonds

\[ (1 + i_{nt})^n = E_t \prod_{i=0}^{n-1} (1 + i_{t+i}) \]

\[ i_{nt} \approx \frac{1}{n} \sum_{i=0}^{n-1} E_t i_{t+i} \]

- Long-term rates are the average of expected future short-term rates (ignoring risk)
– Fisher relationship

\[ i_{nt} = \frac{1}{n} \sum_{i=0}^{n-1} E_t \left( r_{t+i} + \pi_{t+i} \right) \]

* If expected future real interest rates are constant, then the \( n \)-period interest rate fluctuates with expected inflation
– Yield curve – plots interest rates against term to maturity

* Generally positively sloped due to higher risk premia at greater maturities

* If yield curve is rising even more, then expected future one-period interest rates are higher than current one-period interest rates
  
  • Perhaps expected inflation is rising
  
  • Or the real interest rate is expected to rise

* Inverted yield curve often predicts recession

  • Lower future real interest rate implies lower future consumption growth from Euler equation
– Risk Premia

* Optimizing model

\[ E_t \frac{1 + i_{t+1}}{1 + \pi_{t+1}} u_c(c_{t+1}, m_{t+1}) = E_t \frac{P_{1t+1}}{P_{2t}} u_c(c_{t+1}, m_{t+1}) \]

where \( P' \)s represent bond prices.

* Non-zero covariance terms yield risk premia
2 Financial Frictions

Financial market imperfections imply that the quantity of credit, in addition to the interest rate, determines aggregate demand

- Adverse selection
  - Borrowers have different risk and changes in terms of loan affect pool of borrowers
  - Model (Jaffee and Russell)
    * two types of borrowers, honest ones who always repay, and dishonest ones who choose to repay based on costs and benefits
* cost of default

* dishonest borrowers default when loan repayment amount exceed cost of default

* distribution of default costs across borrowers implies the fraction of borrowers who default is increasing in loan amount

* pooling equilibrium, lenders offer same contract to all borrowers since they cannot distinguish types

* lenders with

  - constant returns to scale

  - free entry into lending
· funds available to lenders at exogenously given opportunity cost

· will have zero profits in equilibrium

* Equilibrium interest rate on loans must equal or exceed opportunity cost to borrowers since expected return on loans is less than or equal to interest rate (since some might not pay)

* Incentive to restrict loan amount, for a given interest rate, to increase proportion who repay

– Model (Stiglitz and Weiss)

* Lender’s expected return depends on interest rate and probability he will be repaid

* Two types of borrowers
• Type G repays with probability \( q_g \)

• Type B repays with probability \( q_b < q_g \)

* If lender can observe type and funds are available at opportunity cost of \( r \)
  
  • Type G borrows at rate \( r/q_g \)
  
  • Type B borrows at rate \( r/q_b \)
  
  • Expected return to lender from either type is \( r \)

* If lender cannot observe type and so must charge same interest to both \( (r_l) \)
  
  • Let \( g \) be fraction of borrowers who are type G
• If increase in interest rate above $r$ does not change fraction of borrowers of each type

$$r = [gq_g + (1 - g)q_b] r_l$$

$$r_l = \frac{r}{gq_g + (1 - g)q_b}$$

• However, since

$$r/q_g < r_l < r/q_b$$

• Lender will attract more borrowers of type B and expected return will fall below, so need something additonal to get equilibrium
* Add additional characteristics to loan and begin with one type of borrower

  - Loan amount of $L$ and collateral of $C$

  - If project return is $R$, then lender repays if

    \[ L(1 + rl) < R + C \]

  - Otherwise, borrower defaults and lender receives $R + C$

  - Let $R = R' + x$ with probability $\frac{1}{2}$ and $R = R' - x$ with probability $\frac{1}{2}$

  - Expected return is $R'$ and variance is $x^2$, implying that increase in $x$ is a mean preserving spread representing an increase in risk
· Assume borrower receiving low return chooses default

\[ R' - x < L (1 + r_l) - C \]

· Expected profit to borrower is

\[ E\pi^B = \frac{1}{2} \left[ R' + x - L (1 + r_l) \right] - \frac{1}{2} C \]

· Expected profit to borrower is positive if

\[ x > x^* = L (1 + r_l) + C - R' \]

* Borowers expected returns are increasing in \( x \)

· \( x^* \) is increasing in \( r_l \)

· as interest rate rises, agents with riskier projects will choose to borrow
agents with safe projects will not

borrower can lose no more than collateral and stands to gain more with higher variance, making his expected returns increase in $x$ — cut off lower tail of distribution raising expected profits

Lender’s expected returns are decreasing in $x$

\[ E\pi^L = \frac{1}{2} [L (1 + r_l)] + \frac{1}{2} [C + R' - x] - (1 + r) L \]

Since lender receives fixed amount in good state, and less by $x$ in the bad state his returns are decreasing in $x$
* Add back two types of borrowers

  - Good and bad with $x_g < x_b$, so that good borrowers have less risky projects

  - If loan rate is low enough so that

    $$x_b > x_g > x^* = L (1 + r_l) + C - R'$$

  - Both agents borrow
• If each type is equally likely, lender’s expected profit is increasing in $r_l$

$$E\pi^L = \frac{1}{2} [L (1 + r_l)] + \frac{1}{4} [C + R' - x_g]$$

$$+ \frac{1}{4} [C + R' - x_b] - (1 + r) L$$

$$= \frac{1}{2} [L (1 + r_l) + C + R'] - \frac{1}{4} [x_g + x_b] - (1 + r) L$$

where $x_g > x^*$

• Once $r_l$ rises enough that $x_g = x^*$, additional increases in $r_l$ cause good borrowers to drop out, and lender’s expected profits become

$$E\pi^L = \frac{1}{2} [L (1 + r_l) + C + R'] - \frac{1}{2} [x_b] - (1 + r) L$$
* Credit rationing

  - Let \( r^* \) be the interest rate that tips composition of borrowers
  - Assume excess demand for loans at \( r^* \)
  - If lender raises interest rate, profits fall as good borrowers drop out
  - If keeps interest at \( r^* \) and rations credit, maximizes profits
- Moral Hazard
  - Borrower can choose among projects with different risk and lender cannot monitor his choice
- Stiglitz and Weiss
  * Borrower can invest in project A or project B
    - Project A pays $R^a$ with probability $p^a$ and 0 with probability $1 - p^a$
    - Project B pays $R^b > R^a$ with probability $p^b < p^a$ and 0 with probability $1 - p^b$
    - Probability of success with project B is lower and return with success is higher
• Assume expected payoff from project $A$ is higher

$$p^a R^a > p^b R^b$$

* Expected returns to borrower

  • Project $A$

  $$E\pi^A = p^a \left[ R^a - (1 + r_l) L \right] - (1 - p^a) C$$

  • Project $B$

  $$E\pi^B = p^b \left[ R^b - (1 + r_l) L \right] - (1 - p^b) C$$
- Expected return to project A exceeds expected return to project B if
\[ p^a [R^a - (1 + r_l) L] - (1 - p^a) C > p^b [R^b - (1 + r_l) L] - (1 - p^b) C \]
\[ p^a R^a - p^b R^b > (p^a - p^b) [(1 + r_l) L - C] \]

- Define $r^*_l$ as loan rate when expected returns are equal
\[ \frac{p^a R^a - p^b R^b}{(p^a - p^b) L} + \frac{C}{L} = 1 + r^*_l \]

- For loan rates less than $r^*_l$, borrower prefers project A with less risk and higher expected payoff

- For larger loan rates, prefers riskier project even though its expected payoff is lower
Default option cuts off lower portion of risk distribution

* Expected payment to lender
  - Loan rate below critical value \( (r_l < r_l^*) \)
    \[
    p^a (1 + r_l) L + (1 - p^a) C
    \]
  - Loan rate above critical value \( (r_l > r_l^*) \)
    \[
    p^b (1 + r_l) L + (1 - p^b) C
    \]

* Since expected profits are larger when interest rate is low and borrower chooses project \( A \), increases in loan rate up to \( r_l^* \) increase profits, but any additional increase discreetly decreases profits

* Credit rationing can arise if want to reduce quantity of loans supplied, but not raise interest rate above \( r_l^* \)
• Monitoring Costs (Costly State Verification)

– Period 1

* Lenders are risk-neutral and offer loan contracts which yield expected rate of return $r$

* Borrowers have access to risky investment project of size 1 with random payoff in period 2 of $x \in [0, \bar{x}]$

* Borrowers have no resources of their own, and must borrow to do the investment
– Period 2

* Borrowers costlessly observe $x$ and report $x^s$, a signal of $x$, to lender

* Lenders observe payoff only by paying a state verification fee (monitoring fee) of $c$

* If lender monitors, payoff is dependent on $x$, $R(x)$ with net payoff from monitoring

$$R(x) - c$$

* If the lender does not monitor, payoff can only depend on $x^s$

$$K(x^s)$$

  • Hence, borrower reports smallest $x^s$ and payoff in absence of monitoring is $\bar{K}$
* Lender chooses to report $x^s$ in his best interest

  · If report low $x^s$, lender will monitor and borrower receives $x - R(x)$

  · If report high $x^s$, lender will not monitor and borrower receives $x - \bar{K}$

  · Borrower will report signal leading to monitoring if $R(x) < \bar{K}$
– Optimal contract

* Payment schedule $R(x)$ and value $\bar{K}$

* Maximizes borrowers expected return

\[
E[R^b] \equiv E[x - R(x) | R(x) < \bar{K}] \Pr[R(x) < \bar{K}] + E[x - \bar{K} | R(x) > \bar{K}] \Pr[R(x) \geq \bar{K}]
\]

* Subject to constraint that lender expects to receive at least $r$

\[
E[R^L] \equiv E[R(x) - c | R(x) < \bar{K}] \Pr[R(x) < \bar{K}] + E[\bar{K} | R(x) > \bar{K}] \Pr[R(x) \geq \bar{K}] \geq r
\]
– Solution for optimal contract

* With monitoring, pay out full return to project

\[ R(x) = x \]

* If project earns sufficient return, that is if \( R(x) = x \geq \bar{K} \), then borrower pays lender \( \bar{K} \), and no monitoring occurs

* Like a debt contract
  
  · When returns are sufficient to pay agreed debt repayment, do so
  
  · When not, default, and lender takes proceeds of project
Proof $R(x) = x$, that is lender takes all proceeds in default

* Monitoring cost ($c$) is a dead weight loss

* Optimal contract will minimize dead weight loss

* In equilibrium, constraint that lender receive at least $r$ will be satisfied with equality

* If reduce $R(x)$, monitor more often, reducing return to lender on both counts, so must pay lender more when don’t monitor ($\bar{K}$ increases)

* More frequent monitoring reduces return to borrower

Specific example yielding credit rationing
* Let $x$ be uniformly distributed on $[0, \bar{x}]$

* Equating expected return to lender with $r$ determines $\bar{K}$

$$
\int_0^\bar{x} (x - c) \frac{1}{\bar{x}} dx + \int_\bar{x}^{\bar{x}} \bar{K} \frac{1}{\bar{x}} dx = \int_0^\bar{x} \left( \frac{x^2 - cx}{2\bar{x}} \right) |_{\bar{K}} + \bar{K} \frac{1}{\bar{x}} x |_{\bar{K}} = \frac{\bar{K}^2 - 2c\bar{K}}{2\bar{x}} + \bar{K} \left( \frac{\bar{x} - \bar{K}}{\bar{x}} \right) = r
$$

$$
\bar{K} = (\bar{x} - c) \pm \left( (\bar{x} - c)^2 - 2r\bar{x} \right)^{-\frac{1}{2}}
$$

* When $(\bar{x} - c)^2 > 2r\bar{x}$, there are two real values for $\bar{K}$, one larger than $(\bar{x} - c)$ and one smaller
* $\bar{K}$ has interpretation of loan principle plus interest

* For $\bar{K} > (\bar{x} - c)$, return to lender becomes negative because more monitoring

* If loan supply = loan demand with $\bar{K} < (\bar{x} - c)$, then all borrowers receive loans

* Credit rationing and set $\bar{K} = (\bar{x} - c)$ if excess loan demand at this value for $\bar{K}$. Don’t raise loan interest rate enough to make return negative due to increased monitoring.
• Agency costs (Bernanke and Gertler)

  – Agency costs when principal yields control of project to agent as when lender yields control to borrower: inability to monitor yields agency costs

  – Model assumptions

    * Risk-neutral firms and investors

    * Costly-state verification for investors with cost of \( c \)

    * Firms are indexed by efficiency type \( \omega \), uniformly distributed over \([0, 1]\)

    * Projects require \( x(\omega) \) resources, where \( x' > 0 \)
* Projects yield return $\kappa_1$ with probability $\pi_1$ and $\kappa_2 > \kappa_1$ with probability $1 - \pi_1$

* Expected return on investment projects

$$\kappa = \pi_1 \kappa_1 + (1 - \pi_1) \kappa_2$$

* Risk-free rate of interest is $r$

* Firms have internal resources ($S$)

$$S < x(0)$$
Equilibrium with costless state verification is the social optimum

* All projects whose expected return equals or exceeds opportunity costs of resources receive funding

\[ \kappa - rx(\omega) \geq 0 \]

* Define \( x^* \) as cutoff efficiency level, such that projects requiring fewer resources receive funding and those requiring more do not

  - Firms with \( \omega < \omega^* \) borrow

\[ B = x(\omega) - S \]
Equilibrium with costly state verification

* Firm has incentive to announce bad outcome, \( \kappa_1 \)

* Let \( p \) be the probability that the firm is audited when it announces \( \kappa_1 \)

* Define:
  
  \( P_1^a \) is firm’s payout when \( \kappa_1 \) is announced and auditing takes place

  \( P_1 \) is firm’s payout when \( \kappa_1 \) is announced and no auditing takes place

  \( P_2 \) is firm’s payout when \( \kappa_2 \) is announced
– Optimal lending contract is characterized by values of \( \{p, P_1^a, P_1, P_2\} \) which maximize expected payment subject to constraints

\[
\max \pi_1 [pP_1^a + (1 - p) P_1] + \pi_2 P_2
\]

* Lender’s expected return must be at least as great as opportunity costs of \( rB \)

\[
\pi_1 [\kappa_1 - p(P_1^a + c) - (1 - p) P_1] + \pi_2 [\kappa_2 - P_2] \geq rB
\]

* Firm must have no incentive to report bad state when good state has occurred: firm’s income in good state \( (P_2) \) must exceed what firm would get in good state if reported bad state. With probability \( 1 - p \), firm is not audited and turns over \( \kappa_1 - P_1 \), leaving profits of \( \kappa_2 \) less this amount. With probability \( p \) he is audited receives no profits.

\[
P_2 \geq (1 - p)(\kappa_2 - \kappa_1 + P_1)
\]
* Limited liability requires that even in bad state, payouts be non-negative

\[ P_1^a \geq 0 \quad P_1 \geq 0 \]

* Probability of audit must be between 0 and unity

\[ 0 \leq p \leq 1 \]

– First order conditions assuming an interior solution
\[ \pi_1 \left[ (P_1^a - P_1) + \mu_1 (P_1^a - P_1 - c) \right] + \mu_2 (\kappa_2 - \kappa_1 + P_1) = 0 \]

* \( p \)

\[ \pi_1 p (1 - \mu_1) + \mu_3 = 0 \]

* \( P_1^a \)

\[ \pi_1 (1 - p) (1 - \mu_1) - \mu_2 (1 - p) + \mu_4 = 0 \]

* \( P_1 \)

\[ \pi_2 (1 - \mu_1) + \mu_2 = 0 \]

* \( P_2 \)
– Results

* Since all multipliers are non-negative, $\mu_3 \geq 0$, implying that $\mu_1 \geq 1$. Therefore, constraint on lender’s return holds with equality. Add constraint to objective function

$$
\pi_1 [pP_1^a + (1 - p) P_1] + \pi_2 P_2 + \pi_1 [\kappa_1 - p (P_1^a + c) - (1 - p) P_1] + \pi_2 [\kappa_2 - P_2] - r (x - S)
$$

$$
= \pi_1 [\kappa_1 - p (c)] + \pi_2 [\kappa_2] - r (x - S)
$$

* Equivalent to minimizing expected auditing costs

* If $\kappa_1 \geq rB$, then no auditing is ever necessary because firm prefers to pay $rB$, implying case with no agency costs occurs when

$$
\kappa_1 \geq r (x (\omega) - S)
$$
• When firm’s internal resources are large enough, no auditing costs, \( p = 0 \), and
\[
S \geq x(\omega) - \frac{\kappa_1}{r} \equiv S^*(\omega)
\]

• When firm’s internal resources are smaller, minimize auditing costs by minimizing with respect to \( p \)

• Set \( p \) just large enough to make firm report good state when good state occurs and set \( P^a_1 = P_1 = 0 \), such that firm keeps nothing in bad state

\[
P_2 = (1 - p)(\kappa_2 - \kappa_1)
\]

Substituting \( P_2 \) and \( P^a_1 = P_1 = 0 \) into lender’s constraint
\[
p = \frac{r[x(\omega) - S] + \kappa_1(\pi_2 - \pi_1)}{\pi_2(\kappa_2 - \kappa_1) - \pi_1c}
\]
• Auditing probability is decreasing in returns to good state and in the firm’s own resources.

• Agency costs due to asymmetric information about outcome of project increase cost of external funds by increasing the probability of monitoring in a bad state

• Firms pursue only projects with expected return greater than opportunity costs, where that expected return depends on quantity of internal funding

• Firms with profitable projects and small internal funding can choose not to pursue them, while firms with marginally less profitable projects and more internal funding can choose to pursue their projects
· Negative net worth shocks can reduce investment