Financial Intermediation and Capital Reallocation

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  - When intermediaries are constrained, capital cannot flow from low to high productivity firms
  - Reallocation or redeployment of existing capital

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Measuring Misallocation (Hsieh and Klenow 2009)

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$$\text{where } EF = \frac{\left\{ \int \left(\frac{a_j}{MPK_j^{\alpha}} \right)^{\eta-1} di \right\}^{\frac{\eta}{\eta-1}+\alpha-1}}{\left\{ \int \left(\frac{a_j}{MPK_j^{\alpha}} \right)^{\eta-1} \frac{1}{MPK_j} di \right\}^{\alpha}}$$

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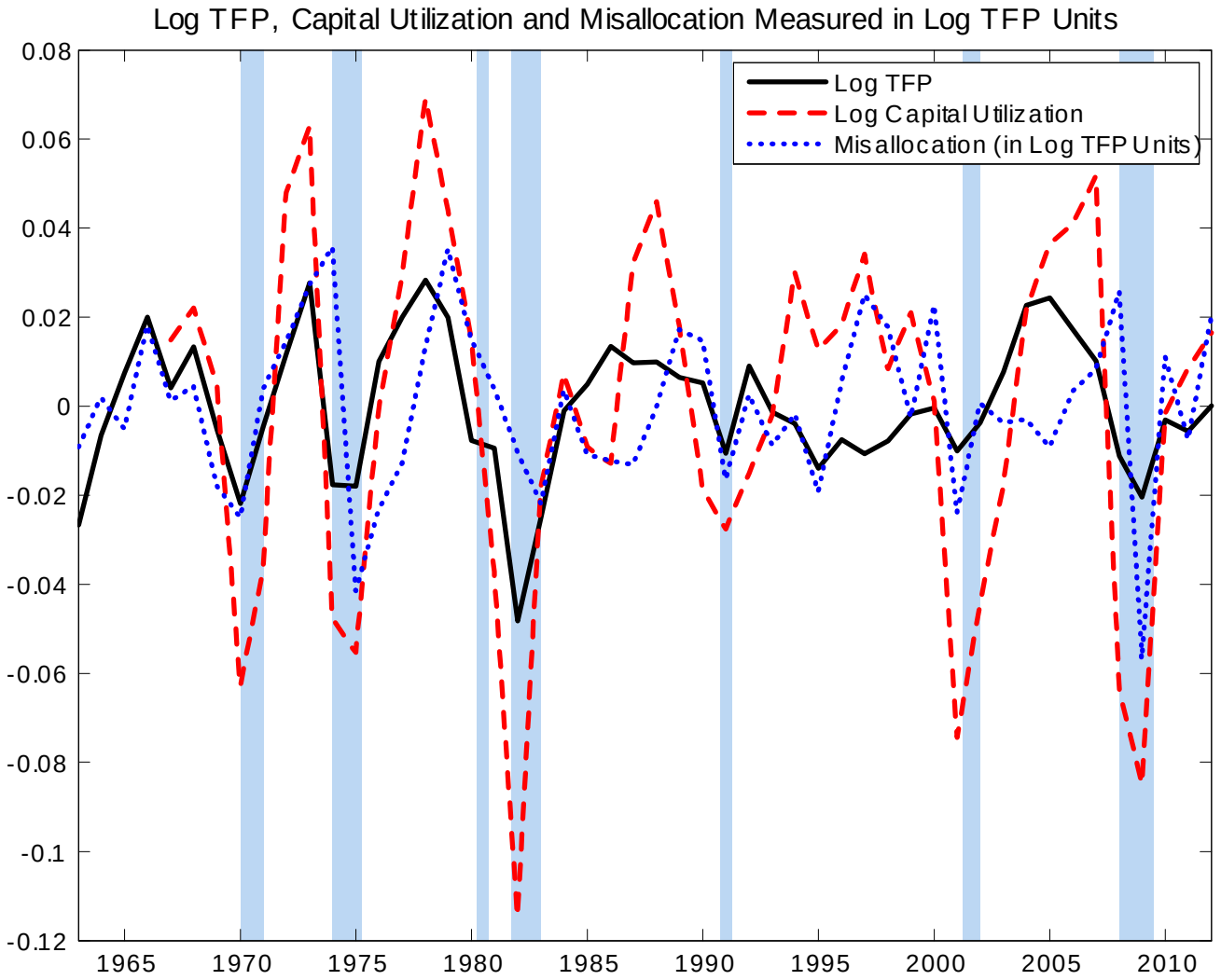
- A first order Taylor approximation:

$$\ln EF = -\frac{1}{2} \left[\alpha (\eta - 1) + 1 \right] \alpha Var \left[\ln MPK_j \right]$$

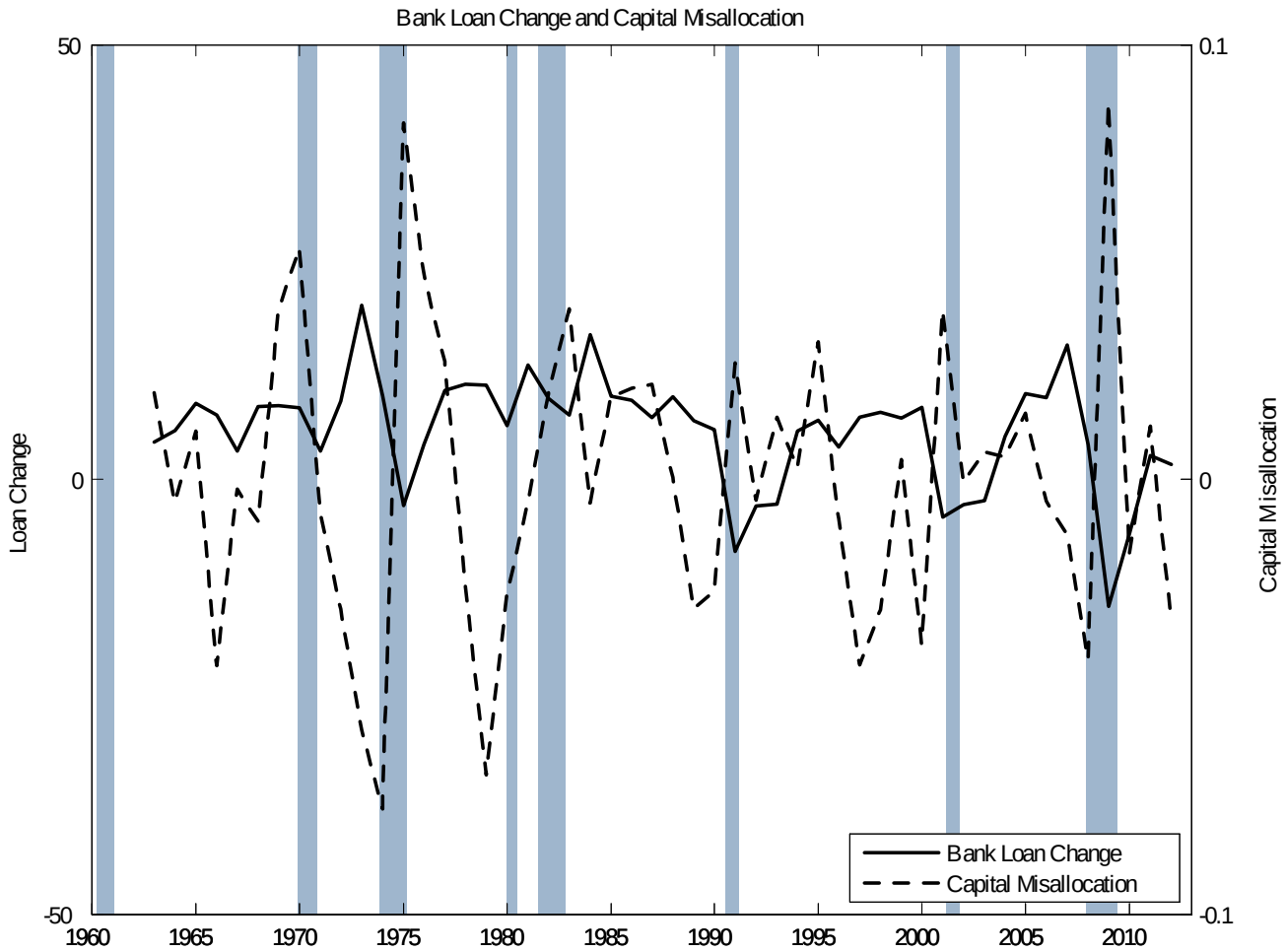
Empirical Evidence_

Capital Misallocation and TFP



Empirical Evidence

Bank Loan and Misallocation



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- Recursive policy function iteration approach, global solution, crisis dynamics

Literature

- Credit market frictions/financial intermediation
  - Bernake and Gertler (1989), Kiyotaki and Moore (1997), Rampini and Vishwanathan (2015).
  - Gertler and Kiyotaki (2010), He and Krishnamurthy (2014), Brunnermeier and Sannikov (2014).
- Capital Reallocation
  - Eisfeldt and Rampini (2006), Hsieh and Klenow (2009), Cui (2014).
  - Kurlat (2013), Fuchs, Green and Papanikoloau (2014), Whited and Li (2014).
- Financial Shocks: Jermann and Quadrini (2012)
- Asset pricing: Bansal and Yaron (2004), Corhay, Kung and Schmid (2015).

Model Setup

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  - Intermediate capial reallocation across islands
- Productivity shocks are islands specific and capital do not move freely across islands.

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- Notation:

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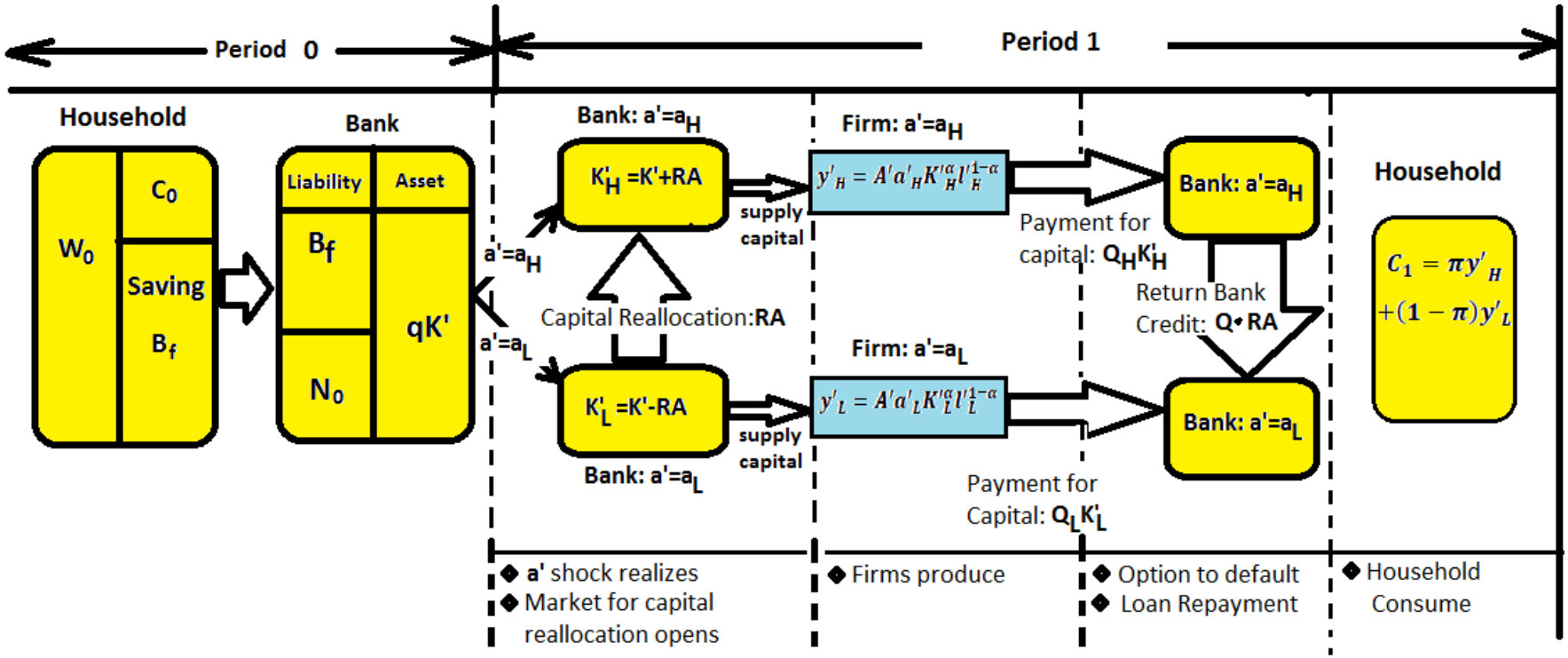
- The efficiency margin given by

$$EF = uf(\phi) = u\frac{\left(\pi\hat{\phi}^{1-\xi}\phi^{\xi} + 1 - \pi\right)^{\frac{\alpha}{\xi}}}{(\pi\phi + 1 - \pi)^{\alpha}\left(\pi\hat{\phi} + 1 - \pi\right)^{\frac{\alpha}{\xi}-\alpha}}$$

Model Setup_

Timeline of Decisions



Model Setup

Limited Enforcement

- The limited enforcement constraint:

$$Q_H(A)\left[K_1 + RA_H(A)\right] - Q(A)\,RA_H(A) - R_f B_f \geq \theta Q_H(A)\left[K_1 + RA_H(A)\right]$$

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- This can be simplified:

$$(1-\theta)\,Q_H\left(A', \phi'\right) - \left[\begin{array}{c} (1-\omega)\,Q(u') \\ -(1-\theta)\,Q_H\left(A', \phi'\right) \end{array}\right]\left(\frac{u'\phi'}{\pi\phi' + 1 - \pi} - 1\right) \geq s'$$

where

$$s' = \frac{R_f B_f}{K'}$$

Implications of the Model

The Main Theorem

Proposition

There exists functions $\hat{s}(A)$, $\bar{s}(A)$ *and* $s^*(A)$, *such that*

- If $s' \leq \hat{s}(A')$, then first best achieves

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- If $\bar{s}(A') < s' \leq s^*(A')$, then the limited commitment constraint for all banks bind

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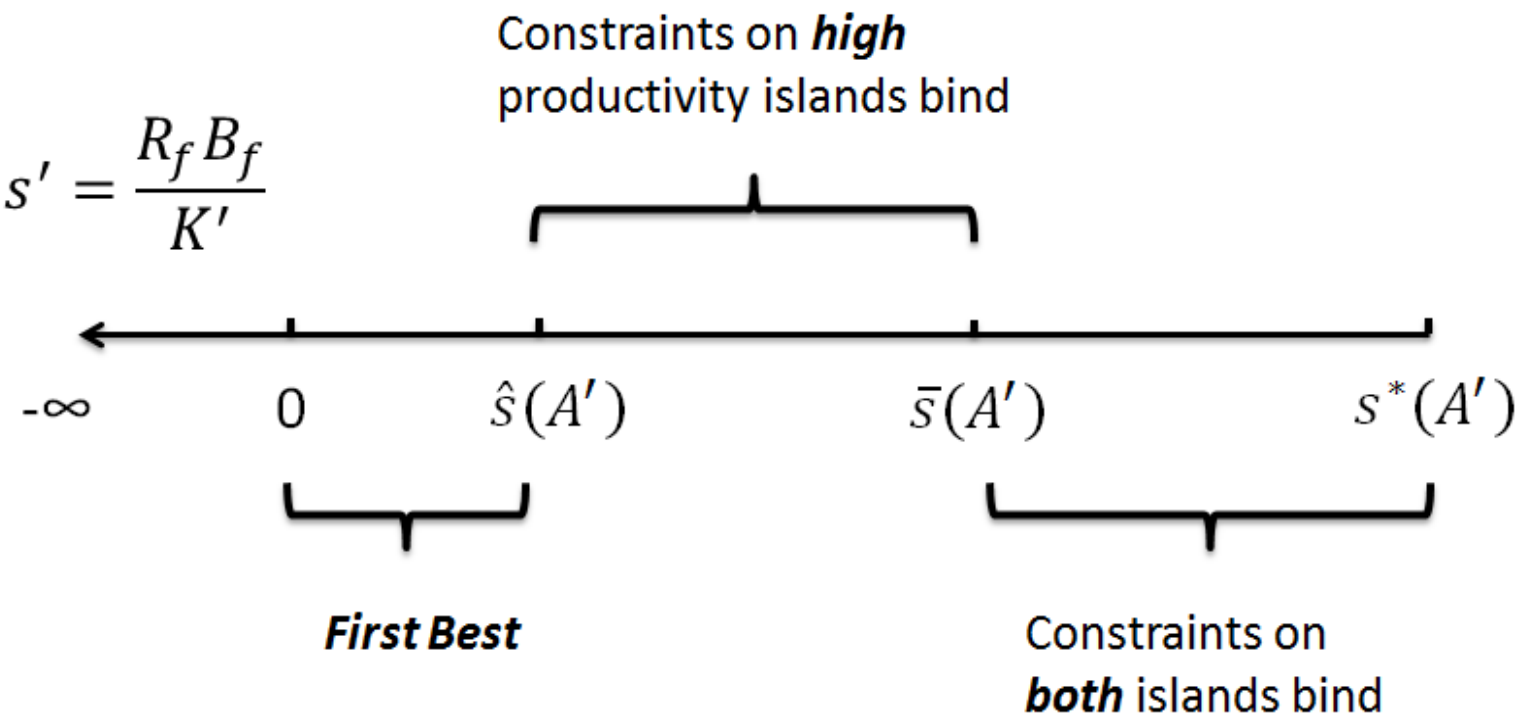
- If $\bar{s}(A') < s' \leq s^*(A')$, then the limited commitment constraint for all banks bind
- The cutoff levels, $\hat{s}(A')$ and $\bar{s}(A')$ are all increasing functions of A'

Implications of the Model

The Limited Enforcement Constraint



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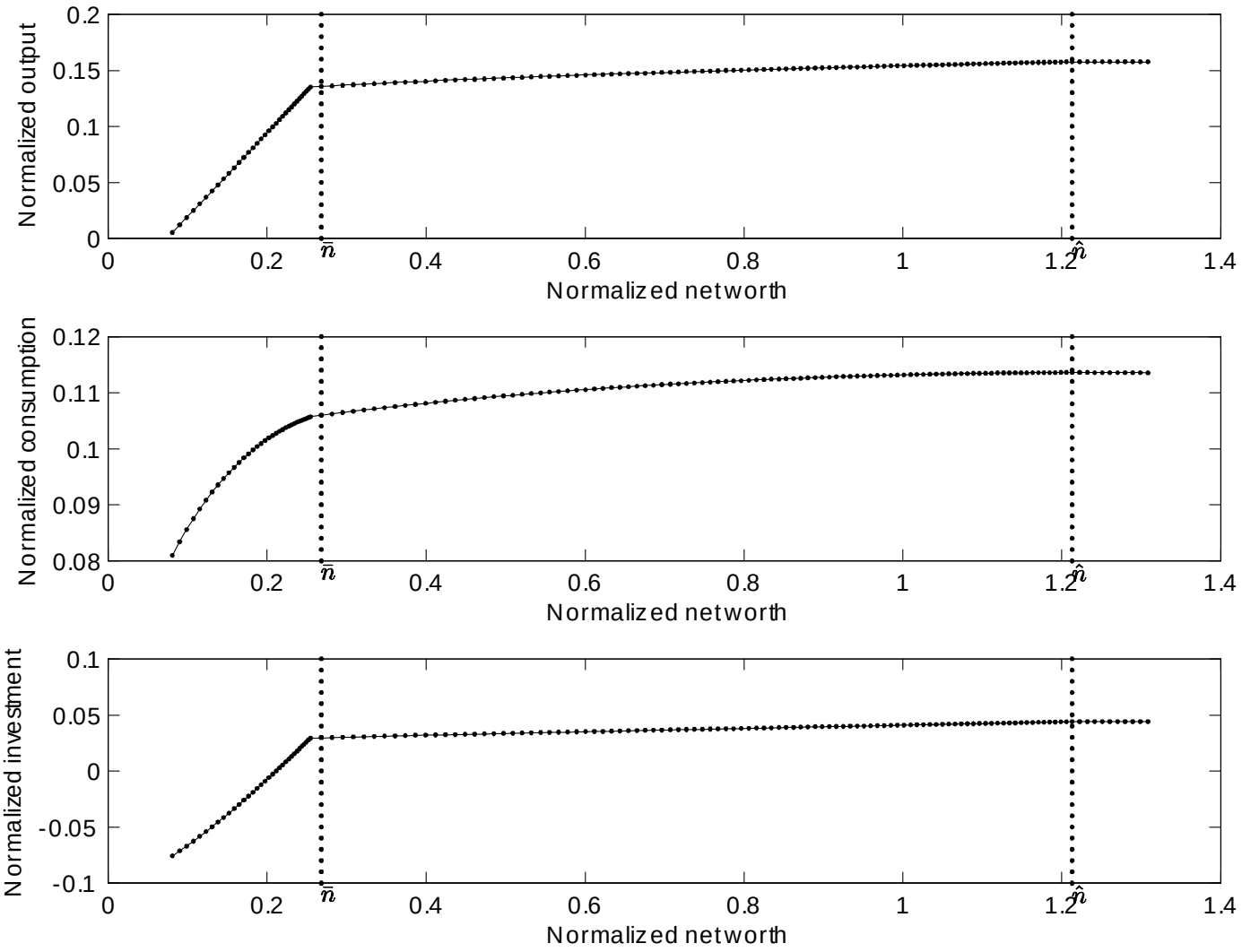
Misallocation and Capital Utilization



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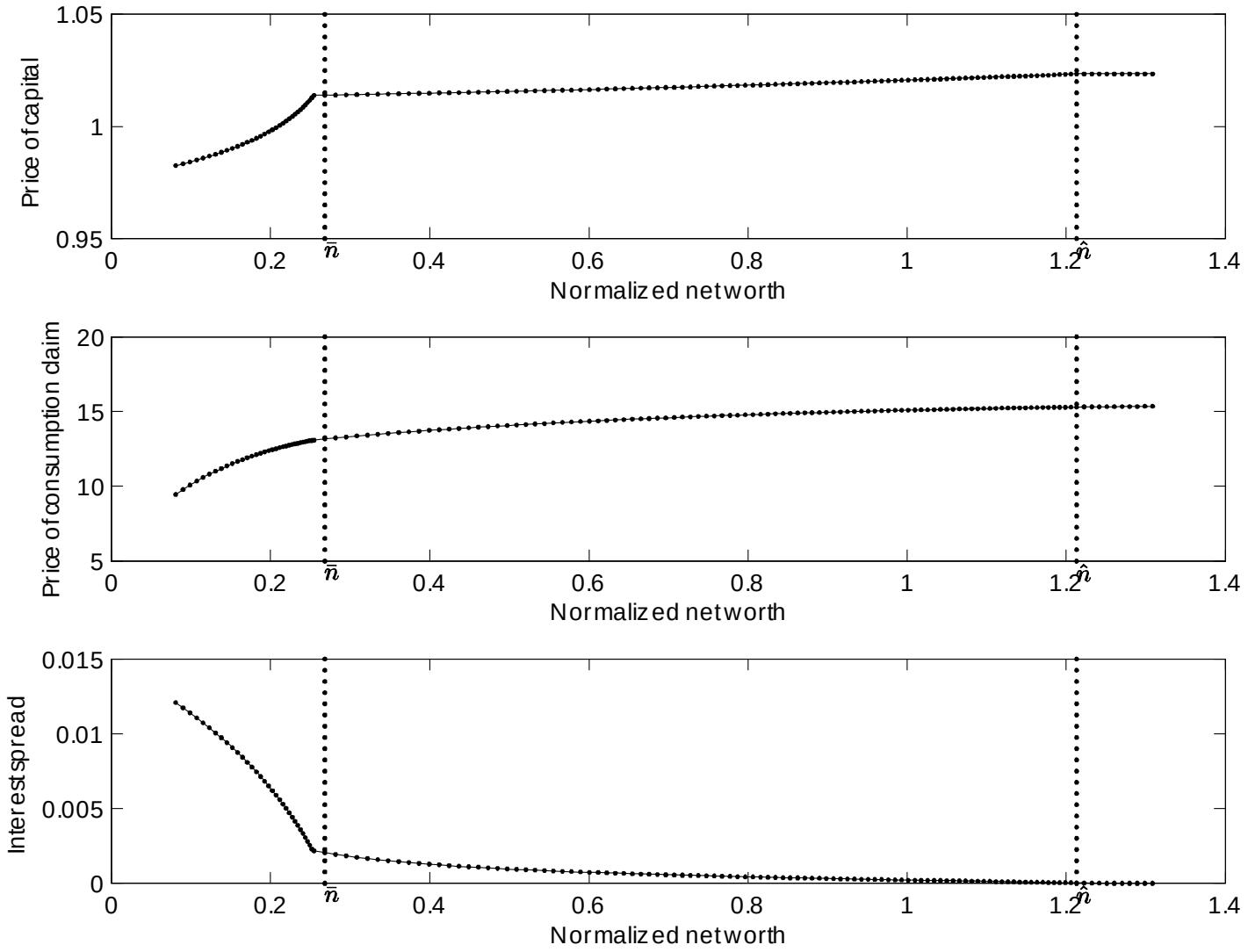
Production and Market Clearing



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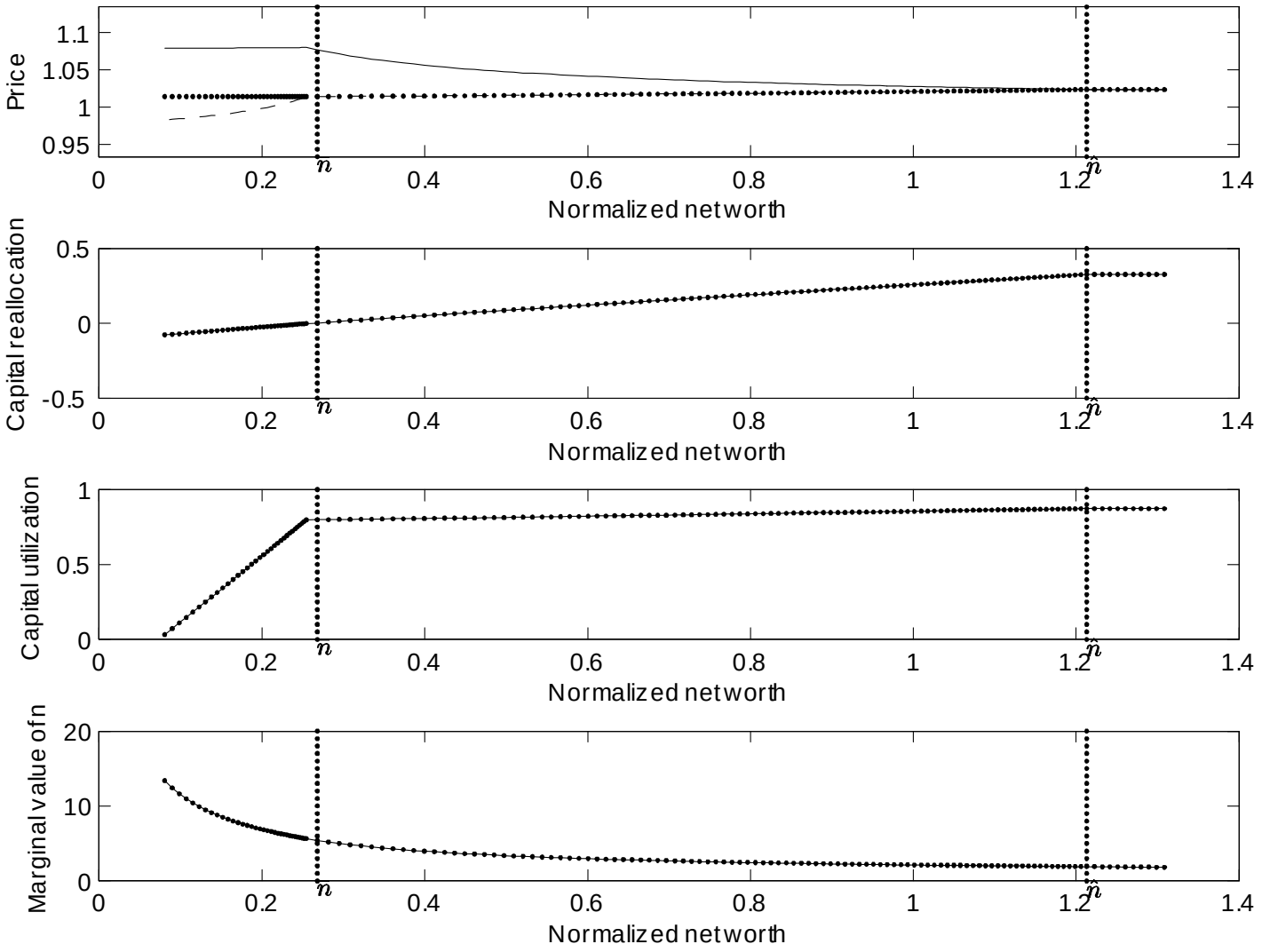

Implications of the Model

Calibration: Macroeconomic Moments

Moments	Data	TFP Shocks	Financial
$Corr\left[\Delta \ln Y, Var\left(\Delta \ln Y\right)\right]$	-0.15	-0.03	-0.44
$Var\left[\Delta uf\left(\phi\right)\right] / Var\left[\Delta TFP\right]$	$-$	11%	96%
$Corr\left[\Delta \ln \widetilde{TFP}, \Delta \ln RA\right]$	0.24	0.64	0.32
$Corr\left[\Delta \ln \widetilde{TFP}, Var\left(\ln MPK\right)\right]$	-0.14	0.37	-0.48
$Corr\left[\Delta \ln \widetilde{TFP}, \ln u\right]$	0.30	0.96	0.91

Implications of the Model

Calibration: Crisis Dynamics

Moments	Non-Recession Periods		Recession Periods	
	Data	Model	Data	Model
$Vol\left[\Delta \ln Y\right]$	3.53%	3.2%	4.18%	5.96%
$Vol\left[\Delta \ln C\right]$	2.32%	1.28%	3.42%	2.28%
$Vol\left[\Delta \ln I\right]$	9.07%	14.08%	9.86%	13.92%
$E\left[u\right]$	81.1%	81.12%	78.41%	73.23%
$Vol\left[u\right]$	3.87%	2.87%	5.27%	4.8%
$E\left[\ln R_I - \ln R_f\right]$	0.56%	0.84%	0.98%	1.62%
$Vol\left[\ln R_I - \ln R_f\right]$	0.36%	0.17%	0.59%	0.23%

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- Extensions: asset pricing, policy issues.