

Discussion of “The Factor Cost Channel of Interest Rate Transmission”

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Summary of the Paper

- ▷ Premise: interest cuts will *increase* firms' growth rate.
- ▷ First, this paper finds that this effect is weaker *with factor competition*.

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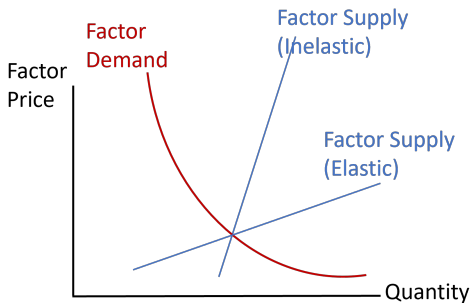
- ▷ Premise: interest cuts will *increase* firms' growth rate.
- ▷ First, this paper finds that this effect is weaker *with factor competition*.
- ▷ Additionally, this paper argues that the cash flow duration of the economy is important.

Specifically, when the **cash flow duration of the economy is high**:

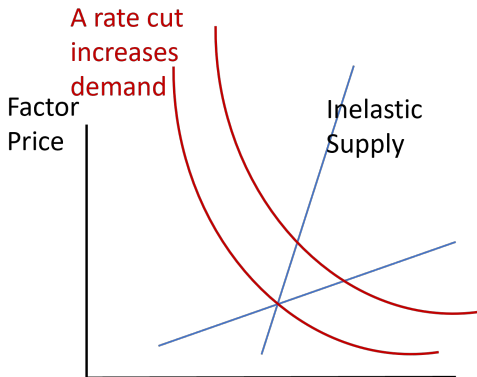
- Real estate prices increase relatively more to a rate cut
- But, the growth rate of other factors (labor) will be lower

The supply and the demand curve

- ▷ Viewing the main intuition of this paper from a supply-demand curve:

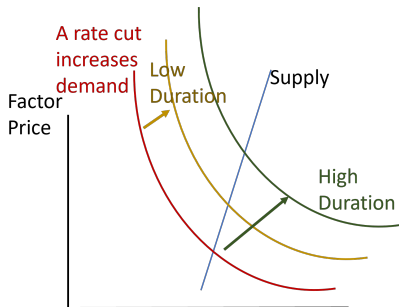


The effect of a rate cut - most baseline case



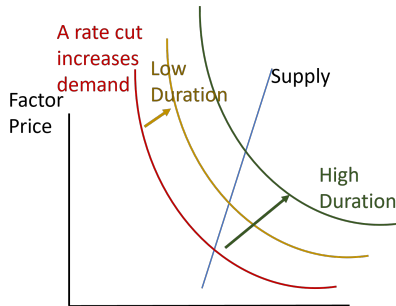
- ▷ Interest rate cut \rightarrow increase in firm investment \rightarrow increase in demand for input factors
- ▷ The factor price will increase more for inelastic factors (i.e., land compared to employment)

The effect of cash flow duration



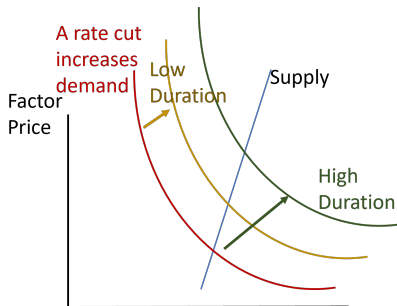
- ▷ Firm Value \approx PV of production - Investment cost
- ▷ When duration is high:
 - “PV of production” will be more sensitive to interest rate changes
 - $MB \gg MC$ per additional unit of investment
 - The demand curve of capital will move further up

Prediction 1: Factor price and interest rate



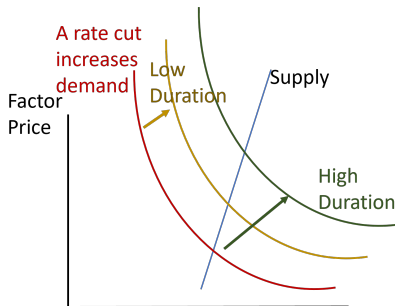
- ▷ Prediction 1: Factor prices will be more sensitive to changes in interest rates if the duration of the economy is high.

Prediction 2: Factor cost channel



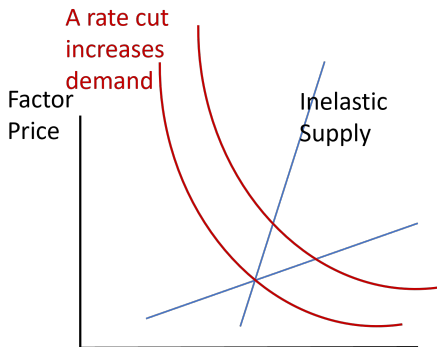
- ▷ Firm investment will respond less to interest rate changes if duration of the economy is high

Prediction 2: Factor cost channel



- ▷ Firm investment will respond less to interest rate changes if duration of the economy is high
- ▷ When the economy has high duration:
 - The factor price increases more to a rate cut.
 - The cost of new investment for firms in the economy will be higher
 - Therefore, the incentive to increase investment is lower with factor competition

Prediction 3: Factor cost channel and supply elasticity



- ▷ Factor cost channel is weaker if factor supply is elastic
- ▷ This is because factor price will not increase as much

Independence assumption in the model

- ▷ The last two predictions strongly relies on the assumption that D_i is independent of average duration of the region $E[D_i]$
- ▷ From the first-order condition (Prediction 1):

$$\frac{\partial \log k_i}{\partial r} = -\frac{\partial \log p}{\partial r} - D_i$$

- ▷ Assuming D_i is independent from $E[D_i]$, 'Prediction 2' is derived:

$$\frac{\partial \log k_i / \partial r}{\partial E[D_i]} = -\frac{\partial \log p / \partial r}{\partial E[D_i]} = \frac{1}{1 + \eta}$$

Independence assumption

- ▷ Is D_i independent from $E[D_i]$?
- ▷ When we instead set $D_i = E[D_i] + \epsilon_i$,
where $\epsilon_i \perp E[D_i]$ we would get

$$\frac{\partial \log k_i / \partial r}{\partial E[D_i]} = -\frac{\partial \log p / \partial r}{\partial E[D_i]} = \frac{1}{1 + \eta} - 1 < 0$$

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- ▷ Empirically, this translates to whether the zip code duration (D_i) is independent from the county level duration ($E[D_i]$). Some evidence that supports this assumption would be helpful.
- ▷ For example, how should we think about GM factory being located next to a Biotech cluster?

Empirical Results

- ▷ Prediction 1: Factor prices will be more sensitive to interest rate if duration of the economy is high

$$\log p_{j,z,c,t} = \beta r_t \times D_{z,t} + \psi_{c,u,t} + \zeta_j + \epsilon_{j,z,c,t},$$

z = zip code, c = county, t =year, $D_{z,t}$ zip code duration

Table 2

The factor competition channel: factor price

Dependent Variable: Factor (Property) Price

	(1)	(2)	(3)	(4)
$r =$	Cum. Shock FFR		10Y	
$r \times \text{Zip dur.}$	-0.018** (0.009)		-0.009** (0.004)	
$r \times \text{Zip IR sens.}$		-0.046*** (0.013)		-0.017*** (0.005)
Observations	1,680,778	1,680,778	1,680,778	1,680,778
Adjusted R^2	0.838	0.838	0.838	0.838

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- ▷ Should you include r_t and $D_{z,t}$ in the regression?
- ▷ Would also like to see the first order effect

Empirical Results

- ▷ Prediction 2: Firms located in high duration economy will invest less in response to the rate cut

$$\Delta E_{i,z,c,t} = \lambda \Delta r_t \times D_{z,t} + \psi_{c,i,t} + \zeta_z + \gamma \Delta E_{i,z,c,t-1} + \epsilon_{j,z,c,t},$$

Table 3
The factor competition channel: employment

	(1)	(2)	(3)	(4)
$r =$	Shock FFR		Shock NS	
$\Delta r \times \text{Zip dur.}$	2.407*** (0.384)		2.105*** (0.396)	
$\Delta r \times \text{Zip IR sens.}$		3.021*** (0.541)		3.140*** (0.595)
Observations	9,930,680	9,930,680	9,930,680	9,930,680
Adjusted R^2	0.254	0.254	0.254	0.254

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- ▷ Why is the shock Δr_t in this table and r_t above?

Relatively minor comments

- ▷ Figure 1 includes a graphical presentation of cash flow duration in the US. It is difficult to read. A more concrete examples would be helpful.
 - Is there substantial zip code level variation within a county, where one would expect that they would not exist.
 - Sonoma county? Clark county?
- ▷ Sample period is 1998-2019. These are times when aggregate firm values tend to decrease in response to a rate cut. This paper assumes the opposite.
- ▷ There seems to be several typos in the model. In Eqn. (3), should D_i be in log terms? If so, what would happen if the log Duration is negative? (if firm is near default) The model implies a sign switch?!

Conclusion

- ▷ The model has an interesting setting, with a rich set of implications to test
- ▷ Interesting analysis at the ZIP code level
- ▷ Empirical results are consistent with model implications
- ▷ I think there is some potential, but a further clean-up of the paper would be helpful!