Discussion

"Labor Reallocation and Productivity Dynamics: Financial Causes, Real Consequences"
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Persistent Output Gaps: Causes and Policy Remedies

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Labor Reallocation and Productivity Dynamics

Financial Causes, Real Consequences

Punch line: Credit growth $\Rightarrow$ Misallocation $\Rightarrow$ Stagnation

1. Reallocation matters for productivity growth
   - 35%-40% of level
   - 45%-55% of standard deviation
2. Reallocation dampens fluctuations productivity growth
   - *Corr* (allocation, common) < 0
3. Credit growth *lowers* productivity growth *through* misallocation
4. Financial crisis *lowers* productivity persistently *if* there is misallocation

Outline

- Measuring reallocation
- Data
- Estimating effect credit growth on misallocation
- Estimating effect misallocation in financial crises
- Some suggestions

Measuring Reallocation

- Decomposition productivity using sector-level data (Olley and Pakes)

$$\text{aggregate prod} \;=\; \text{average prod} \;+\; \mathit{Cov}\left(\text{prod}_s, \text{size}_s\right)$$

- Decomposition productivity growth

$$\begin{aligned}\Delta \text{ agg prod} \quad = \quad & \underbrace{\Delta \text{ avg prod}}_{\text{common component}} \\ & + \underbrace{\Delta \mathit{Cov} \text{ due to } \Delta \text{prod}_s}_{\text{common component (?)}} \\ & + \underbrace{\Delta \mathit{Cov} \text{ due to } \Delta \text{size}_s}_{\text{reallocation}}\end{aligned}$$

- We might expect $\mathit{Corr}\left(\text{allocation, 'common'}\right) < 0$ because
  - Large sections have lower productivity growth
  - More productive sectors grow larger

Data

- Measuring reallocation
  - 9 aggregated (1-digit) sectors
- Estimating behavior reallocation
  - 23 countries
  - $\leq$ 6 five-year periods (high frequencies 'noisy' and 'unreliable')

Estimating effect credit growth on misallocation

- Regress

$$\text{prod growth}_{it} = \beta_i + \beta_t + \theta \left(\frac{\text{private credit}}{\text{GDP}} \right)_{it} + \text{controls} + \varepsilon_{it}$$

- Credit growth *lowers* productivity growth *through* misallocation

Estimating effect credit growth on misallocation

Table 3: Private credit to GDP growth, productivity growth and its components

	(i)	(ii)	(iii)	(iv)	(v)	(vi)
	Productivity Growth	Allocation component	Common component	Productivity Growth	Allocation component	Common component
Growth in private credit to GDP	-0.0795**	-0.0522**	-0.0272	-0.0973***	-0.0305***	-0.0668**
	(0.0346)	*(0.0205)*	*(0.0394)*	*(0.0246)*	*(0.0113)*	*(0.0271)*
Initial private credit to GDP	0.0281	-0.0164	0.0445	0.00915	-0.00253	0.0117
	(0.0361)	*(0.0229)*	*(0.0372)*	*(0.0183)*	*(0.00871)*	*(0.0197)*
Employment growth	-0.407***	0.152***	-0.559***	-0.294***	0.0852**	-0.379***
	(0.0730)	*(0.0491)*	*(0.0874)*	*(0.0782)*	*(0.0385)*	*(0.0847)*
Government consumption to GDP	-2.511***	0.228	-2.739***	-1.760***	0.110	-1.870***
	(0.733)	*(0.423)*	*(0.718)*	*(0.423)*	*(0.216)*	*(0.461)*
CPI Inflation	-0.0316	-0.0140	-0.0176	-0.0840**	-0.0179	-0.0662
	(0.0247)	*(0.0143)*	*(0.0301)*	*(0.0352)*	*(0.0164)*	*(0.0424)*
Dummy for financial crisis	-0.0106	0.0117	-0.0223	-0.00674	0.00266	-0.00940
	(0.0116)	*(0.00786)*	*(0.0145)*	*(0.00740)*	*(0.00461)*	*(0.00867)*
initial GDP per person employed (log of)	-0.362***	-0.0197	-0.343***	-0.195***	-0.0431*	-0.151***
	(0.0543)	*(0.0491)*	*(0.0884)*	*(0.0412)*	*(0.0230)*	*(0.0530)*
Observations	103	103	103	186	186	186
R-squared	0.837	0.555	0.848	0.706	0.343	0.665

Note: This table reports the estimated coefficient for independent variables reported in the first column, the dependent variable being aggregate productivity growth (columns (i) & (iv)), the allocation component (columns (ii) & (v)), the common component (columns (iii) & (vi)). Growth rates are computed using 5-year windows in estimations (i)-(iii), 3-year windows in estimations (iv)-(vi). All estimations include country and time fixed effects. Robust standard errors are in parentheses. Statistical significance at the 1%/5%/10% respectively indicated with ***/**/*.

Estimating effect credit growth on misallocation

- Regress

$$\text{prod growth}_{it} = \beta_i + \beta_t + \theta \left(\frac{\text{private credit}}{\text{GDP}} \right)_{it} + \text{controls}_{it} + \varepsilon_{it}$$

- Credit growth *lowers* productivity growth *through* misallocation
- Minor issues with inference
  - Test relevant differences directly
  - Cluster standard errors to account for autocorrelation
  - Account for 2-step estimation
- Major concerns about endogeneity

Estimating effect misallocation in financial crises

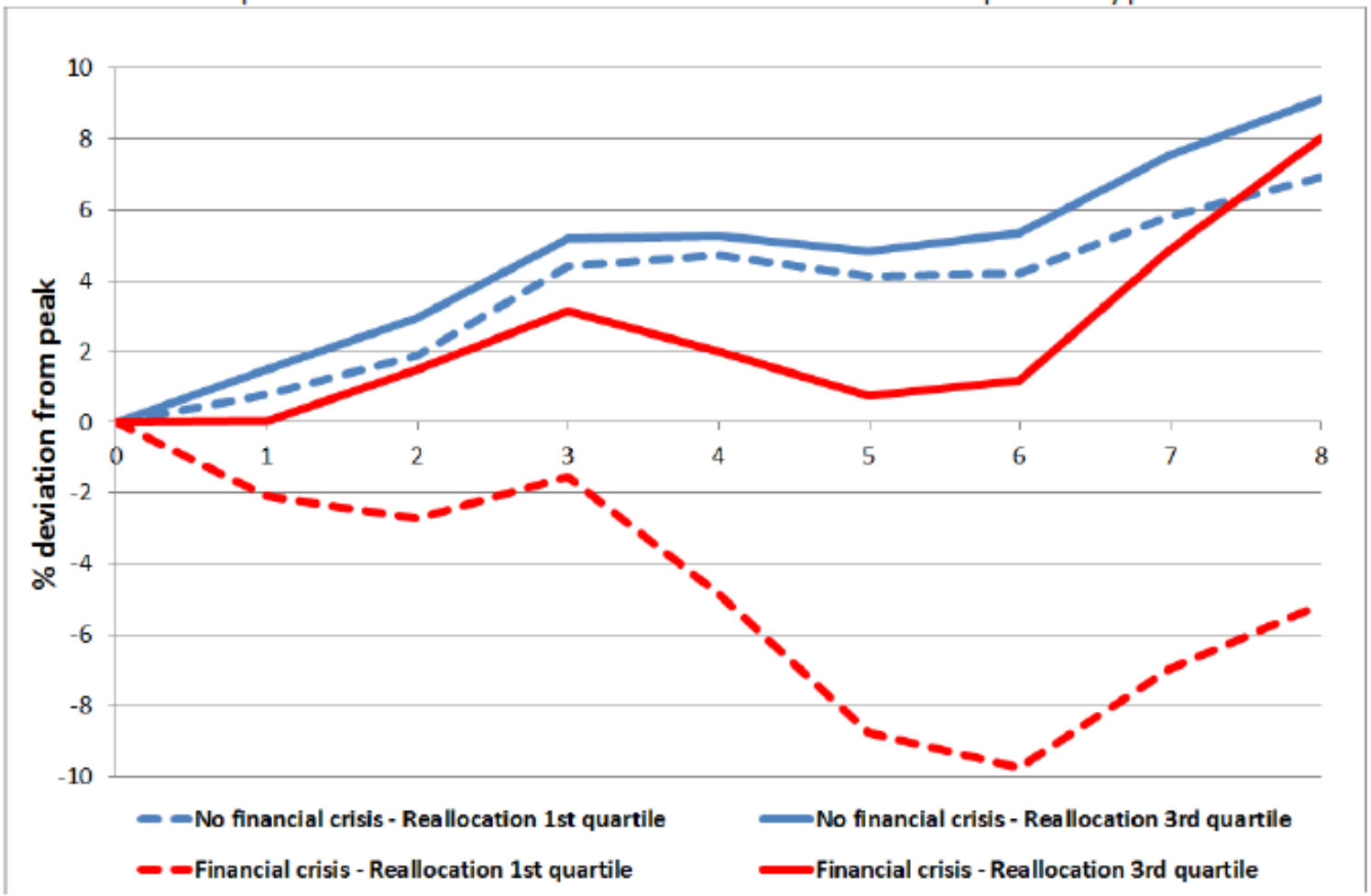
- Unit of observation: Productivity peak
- Regress (for $h = 1, 2, ..., 8$)

$$\begin{aligned} \text{cum prod growth}_{i,t,t+h} \quad = \quad & \beta_i + \theta_a^0 \ \text{alloc}_{i,t-3,t} + \theta_c^0 \ \text{common}_{i,t-3,t} \\ & + \theta_a^1 \ \text{FC}_{it} * \text{alloc}_{i,t-3,t} \\ & + \theta_c^1 \ \text{FC}_{it} * \text{common}_{i,t-3,t} + \varepsilon_{it} \end{aligned}$$

- Financial crisis *lowers* productivity persistently *if* there is misallocation

Estimating effect misallocation in financial crises

Graph 3: The effect of labour reallocation and financial crises on the productivity path



Estimating effect misallocation in financial crises

Table 12: Labour reallocation, sector-level productivity growth, credit expansion and financial crises

Dependent variable: Aggregate Productivity Growth								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Allocation component × FC	85.67**	204.1***	207.5**	285.2**	396.2***	466.6***	528.6***	615.5***
	(40.09)	(61.37)	(78.61)	(115.8)	(134.6)	(145.6)	(152.5)	(170.3)
Allocation component × NFC	31.30***	41.70**	37.82	37.23	52.23	69.82*	88.37**	105.6**
	(11.06)	(18.18)	(33.48)	(41.14)	(38.79)	(38.94)	(36.65)	(40.59)
Common component × FC	28.49	64.15*	74.84*	115.2**	165.3***	196.8***	224.9***	254.1***
	(24.12)	(34.53)	(43.73)	(56.54)	(56.27)	(58.78)	(61.99)	(69.28)
Common component × NFC	8.021	37.37**	35.77	44.86	59.30*	75.84**	95.95***	119.6***
	(12.41)	(18.36)	(22.95)	(28.78)	(30.58)	(31.17)	(32.75)	(37.06)
FC dummy	-2.307**	-5.643**	-5.664*	-8.201**	-10.75***	-12.13***	-12.25***	-12.82**
	(1.098)	(2.132)	(2.848)	(3.747)	(3.965)	(4.180)	(4.314)	(4.777)
Credit to GDP growth	0.707	2.117	3.754	5.359	9.766	10.80	7.445	7.638
	(2.459)	(3.515)	(5.148)	(6.686)	(6.632)	(7.046)	(8.134)	(8.811)
Observations	79	79	79	79	79	79	79	79
R-squared	0.582	0.732	0.719	0.702	0.706	0.697	0.704	0.718
H0: Alloc × FC = Alloc × NFC	*0.207*	*0.019*	*0.059*	*0.047*	*0.018*	*0.011*	*0.007*	*0.004*
H0: Com × FC = Com × NFC	*0.296*	*0.309*	*0.196*	*0.080*	*0.014*	*0.008*	*0.007*	*0.011*
H0: Alloc × FC = Com × FC	*0.121*	*0.003*	*0.025*	*0.046*	*0.029*	*0.020*	*0.012*	*0.009*
H0: Alloc × NFC = Com × NFC	*0.153*	*0.856*	*0.960*	*0.875*	*0.877*	*0.895*	*0.867*	*0.765*

Note: This table reports the estimated coefficients for each of the independent variables reported in the first column in the regression using as dependent variable aggregate labour productivity growth between peak and peak+n years, n being reported in parentheses in the second row of the table. Allocation (Common) refers to the allocation (common) component of labour productivity growth measured between peak-3 and peak as defined in equation (8) in section 2. FC dummy is equal to one if a financial crisis hits between peak-3 years and peak+2 years and equal to zero otherwise. Credit to GDP growth is measured from peak-3 years to peak. A variable name followed by the sign × FC (× NFC) indicates an interaction term which is equal to the variable when the financial crisis dummy is equal to one (equal to zero) and equal to zero (equal to the variable) otherwise. All regressions include the following unreported control variables: all real GDP and employment y-o-y growth rates between peak-3 and peak as well as country fixed effects. Robust standard errors are in parentheses. Statistical significance at the 1%/5%/10% respectively indicated with ***/**/*. The four last rows report the p. value attached to the F-test where the null hypothesis H0 is that the estimated coefficients for the two reported variables are identical.

Estimating effect misallocation in financial crises

- Unit of observation: Productivity peak
- Regress (for $h = 1, 2, ..., 8$)

$$\begin{aligned}\text{cum prod growth}_{i,t,t+h} = \; & \beta_i + \theta_a^0 \, \text{alloc}_{i,t-3,t} + \theta_c^0 \, \text{common}_{i,t-3,t} \\ & + \theta_a^1 \, \text{FC}_{it} * \text{alloc}_{i,t-3,t} \\ & + \theta_c^1 \, \text{FC}_{it} * \text{common}_{i,t-3,t} + \varepsilon_{it}\end{aligned}$$

- Financial crisis *lowers* productivity persistently *if* there is misallocation
- This regression may be asking too much from the data
- Should use level of misallocation rather than growth?

Conclusion

- A hard battle, but worth fighting
  - Data limits what can be done
  - But the story is interesting enough to try
- Drop 'peak analysis' of financial crises
- Address endogeneity
  - Lags as instruments
  - Interactions cf Rajan and Zingales (1998)
    - Regress alloc on (global credit) $*$ (country-spec ind comp)
    - Regress prod on (global fin crisis) $*$ (country-spec misalloc)
- Explore the mechanism
  - How does the effect of credit growth vary across groups of countries?