JP-MOPS Projects

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Outline of Today's Talk

- Update of the human resource paper (Kambayashi)
  - Update

- Preliminary results from JP-MOPS and transaction data (Ohyama)
  - Productivity regressions
  - Years of truncational relationship regressions
  - Uncertainty regressions

JP-MOPS Projects

2017 JP-MOPS

- Manufacturing, Food & Drink Retail, Information Technology Service
- Establishment level & 2015 reference year
- 11,405 observations for manufacturing

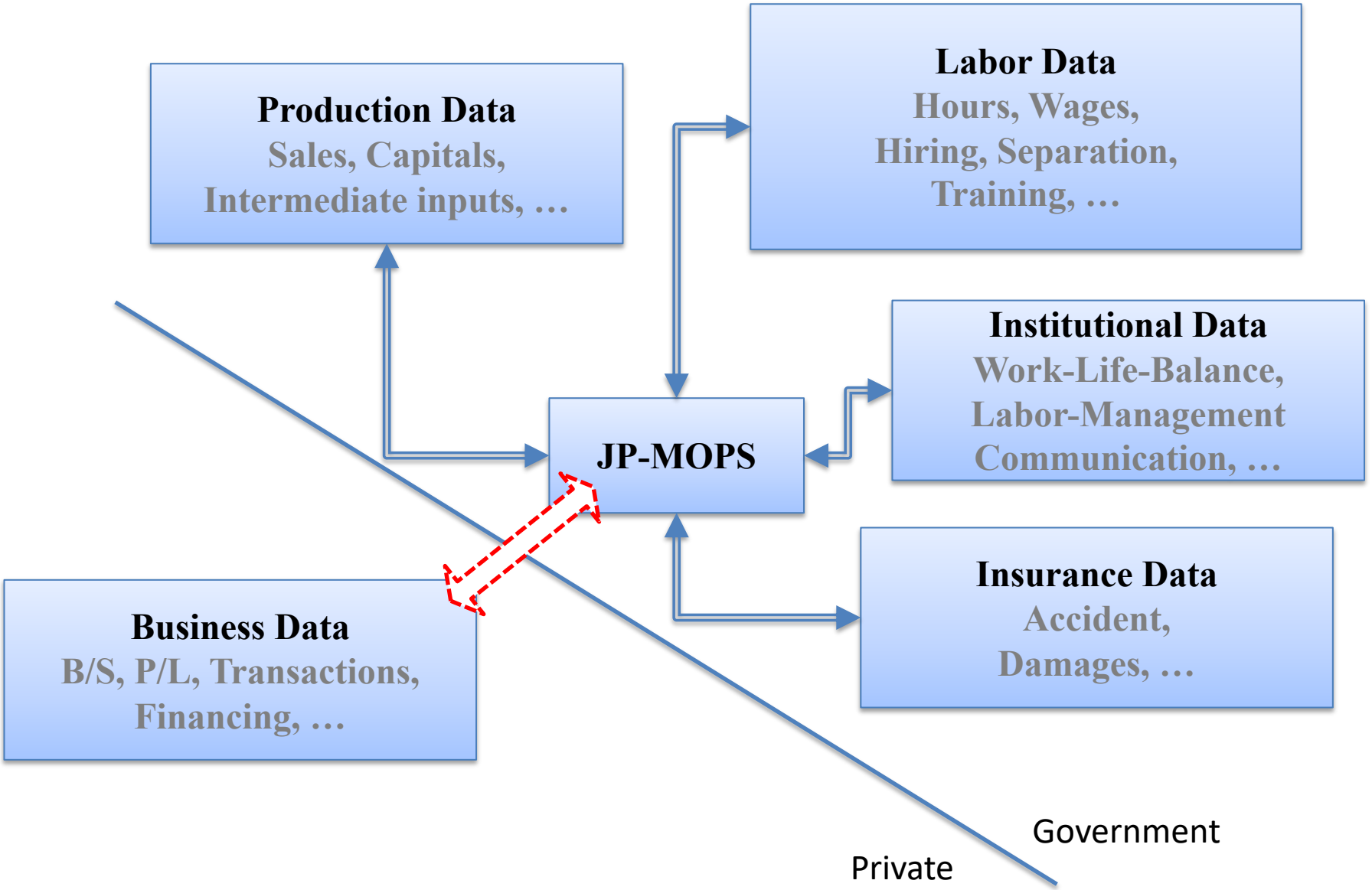
2018 JP-MOPS

- Medical and Other Health Services, Wholesale, Road Freight Transport
- Establishment level
- Medical: 5,161(32.0%), Wholesale: 12,277 (31.1%), Road Freight Transport: 3,725, (34.5%)

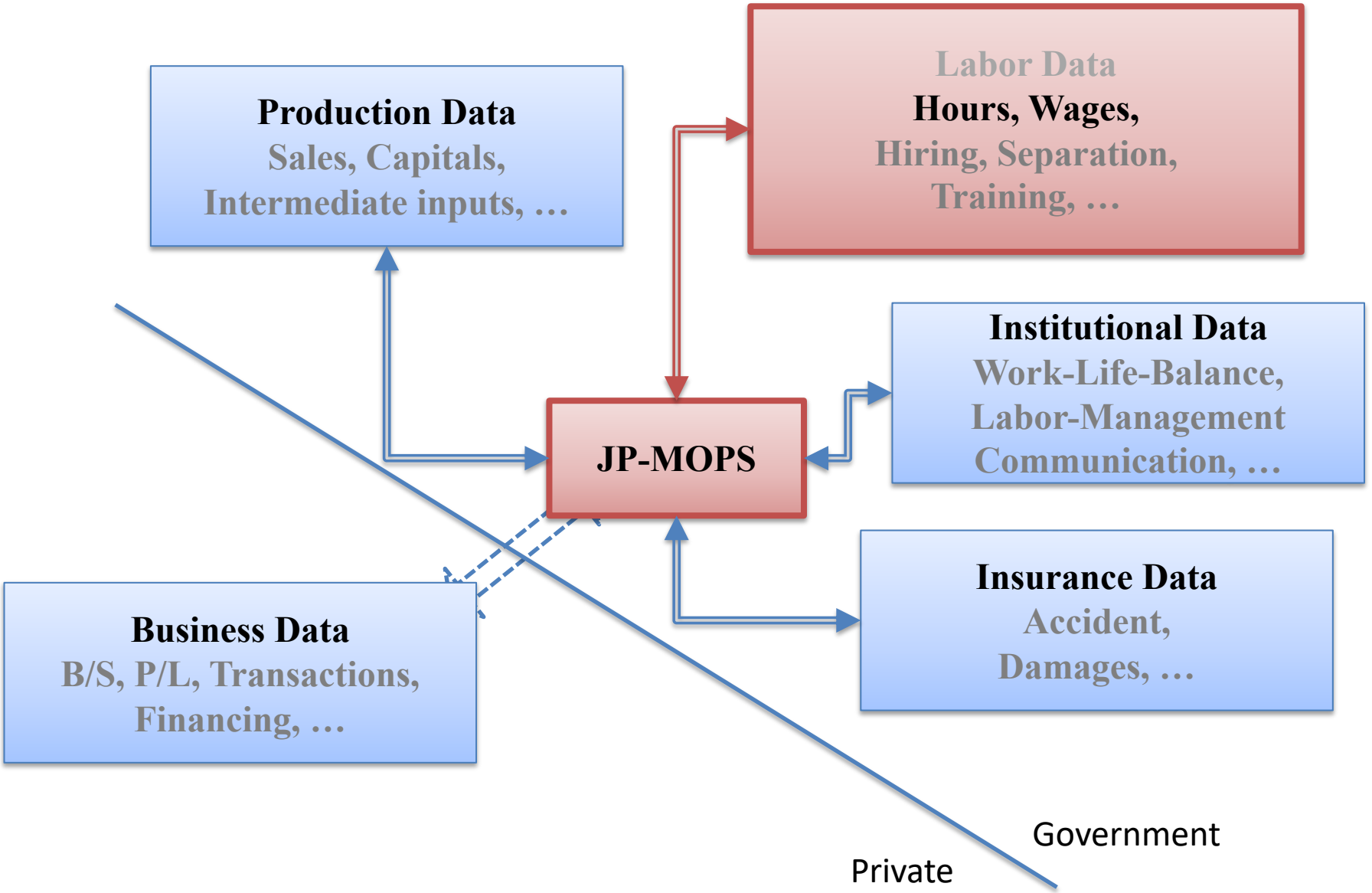
2020 JP-MOPS

- Manufacturing plus other industries
- Establishment level
- Late 2020 or early 2021

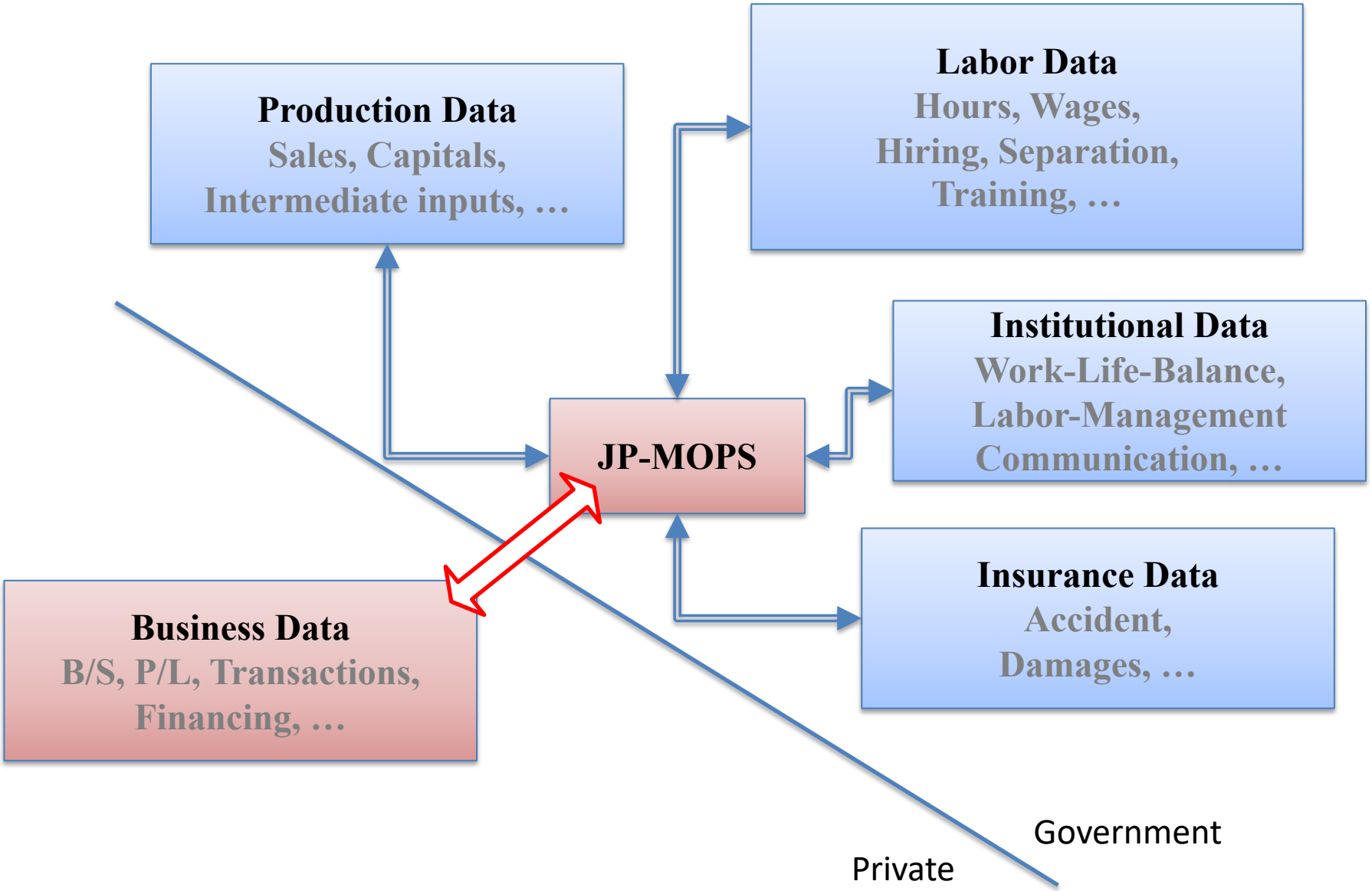
JP-MOPS and other Stats



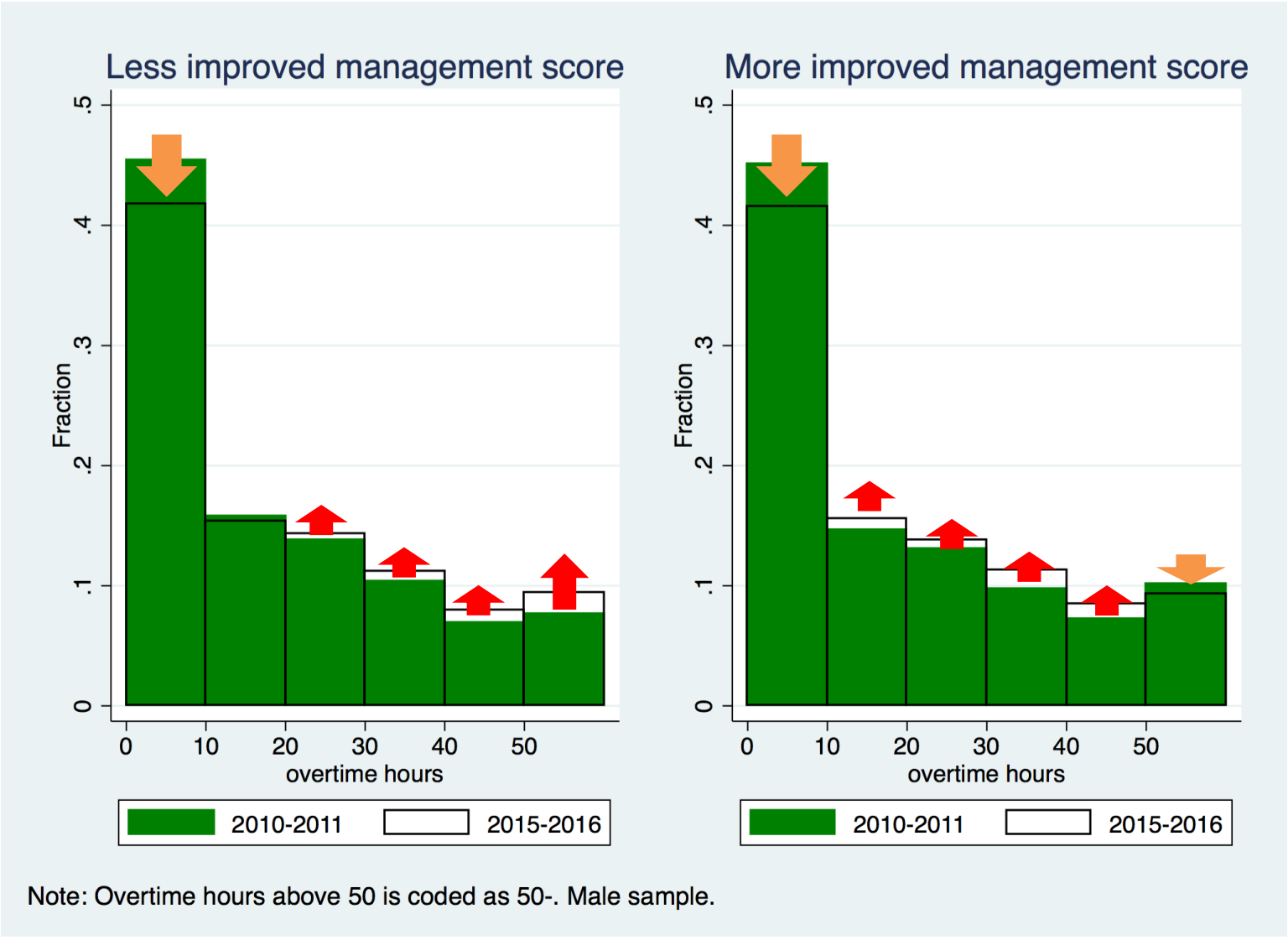
JP-MOPS and other Stats



JP-MOPS and other Stats



Change in distribution of overtime work and change in management practices



Note: Overtime hours above 50 is coded as 50-. Male sample.

Overtime work and Management Practice: Looking at changes in distribution

Binary for more overtime than k
for worker i establishment j
year t

$$\mathbb{I}(overtime_{ijt} > k) = \beta_3 M_{jt} + X_{it}\gamma_3 + \delta Z_{jt} + E_j + year_t + u_{ijt} \quad \cdots \quad (3)$$
$$(k = 5, 10, 15, \ldots, 50)$$

Management Score
of establishment j
year t

Temporal demand
shock control for
establishment j year t

Table 2. Distribution of overtime hours and management practices

Variables	(1) $\mathbb{1}(OH \geq 5)$	(2) $\mathbb{1}(OH \geq 10)$	(3) $\mathbb{1}(OH \geq 15)$	(4) $\mathbb{1}(OH \geq 20)$	(5) $\mathbb{1}(OH \geq 25)$	(6) $\mathbb{1}(OH \geq 30)$	(7) $\mathbb{1}(OH \geq 35)$	(8) $\mathbb{1}(OH \geq 40)$	(9) $\mathbb{1}(OH \geq 45)$	(10) $\mathbb{1}(OH \geq 50)$
Monitoring–target	-0.006	-0.027	-0.071	-0.114	-0.134	-0.132	-0.117	-0.096	-0.080	-0.068
	(0.070)	(0.077)	(0.088)	(0.094)	(0.093)	(0.083)	(0.067)	(0.058)	(0.048)	(0.041)
Bonus–promotion	0.218	0.258	0.257	0.261	0.235	0.179	0.140	0.097	0.057	0.044
	(0.085)	(0.084)	(0.093)	(0.100)	(0.102)	(0.092)	(0.073)	(0.062)	(0.050)	(0.044)
Displacement	-0.072	-0.042	-0.004	-0.014	-0.013	-0.016	-0.034	-0.028	-0.035	-0.021
	(0.057)	(0.055)	(0.055)	(0.051)	(0.050)	(0.046)	(0.040)	(0.036)	(0.032)	(0.030)
Observations	116,374	116,374	116,374	116,374	116,374	116,374	116,374	116,374	116,374	116,374
Mean dep. var.	0.638	0.544	0.464	0.388	0.316	0.256	0.200	0.154	0.109	0.081

Overtime work and Management Practices
Possible explanations

Monitoring and targets practices enables leveling of production and reduce problems triggering long overtime

- Collecting and reviewing data on production progress
- Setting targets at moderate level
- Continuous improvements of production system

Individual-performance-based bonus and promotion induce more workers' effort

- Especially for short-tenured workers for career concern
- Relationship fades out for long hours: marginal productivity gain < marginal effort cost

Management Practice meets Labor Market Outcomes
Wrap up summary

Structured Management Practices ⇔

- Within-establishment overtime differentials↓
- Within-establishment wage differentials↓

The change in Management Practice is correlated with the changes in labor market outcomes, in a way consistent with HRM theories.

Management literature have shown structured management practices improve productivity. Our results suggest pathways.

Motivation

Anecdotal evidence

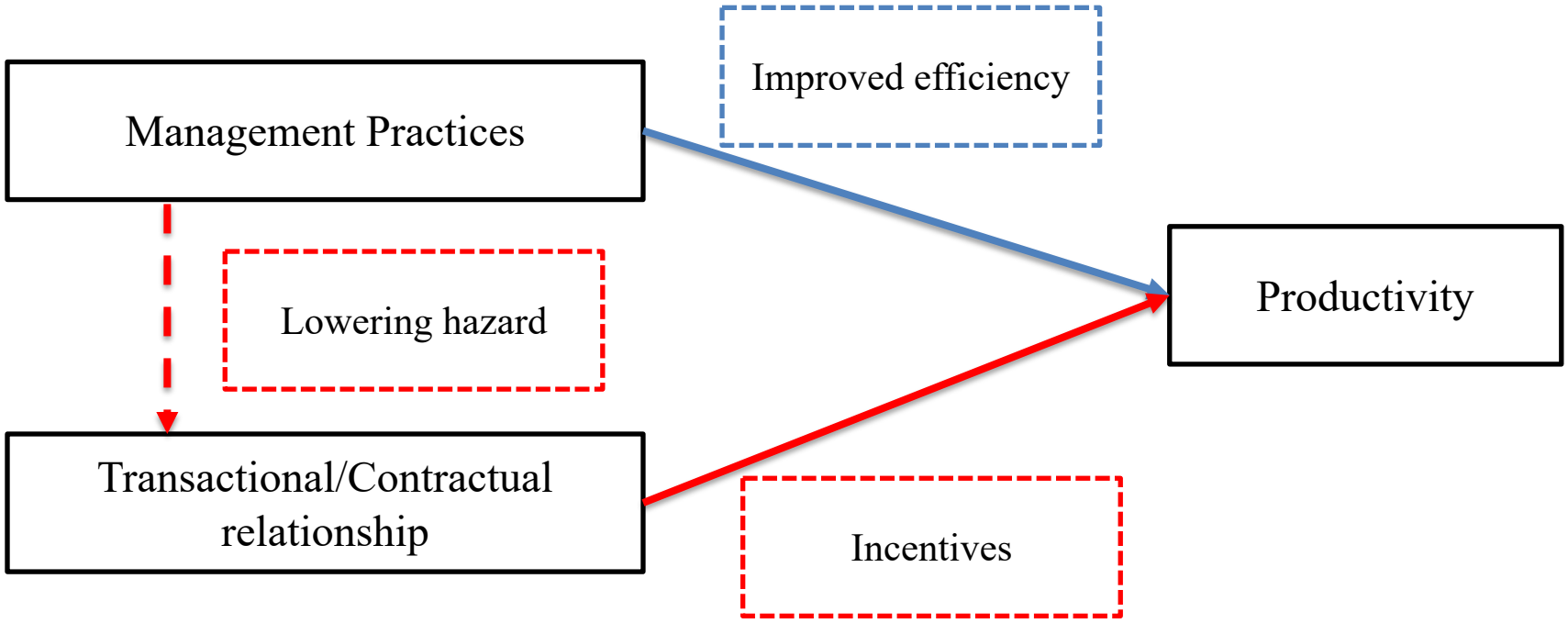
- The Japanese automobile makers developed just-in-time production and established a long-term relationship with their suppliers
- Not only the automobile makers' productivity but also the suppliers' productivity were high
- Efficient production and quality control of suppliers are critical for the just-in-time production
- The automobile makers adjusted the order volume and content, based on past performances of a supplier

Takeaways

(1) Superior management practices go hand in hand with a particular transactional/contractual relationship

(2) These two factors and their interaction affect firm performances, especially productivity, by incentives

Research Question



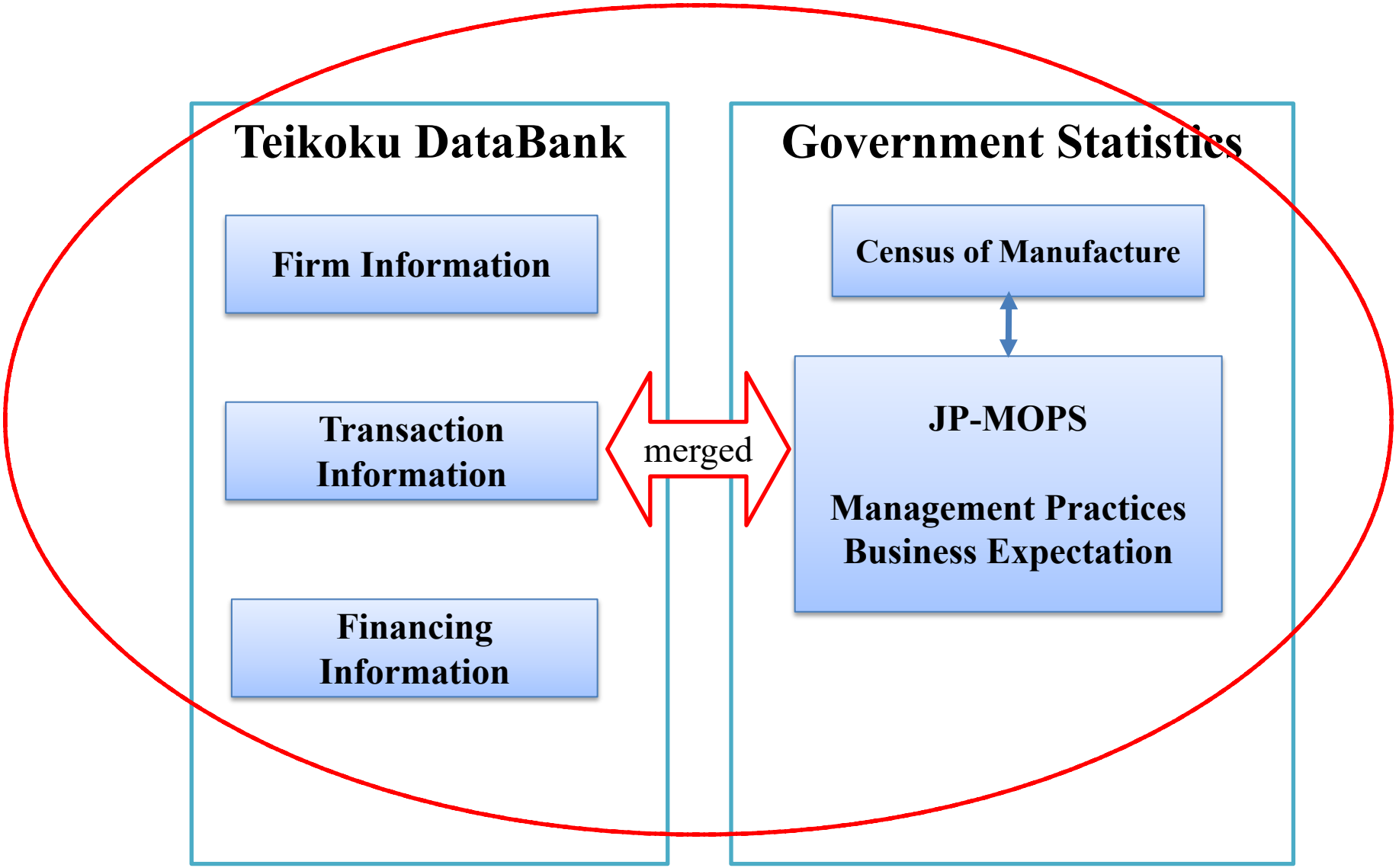
Research Question

- Do management practices reduce transaction/contractual hazard and allow a high-powered incentive system?

Research Method

- Combine management practices, transaction, and uncertainty data

JP-MOPS and TDB



* This project is part of joint research between Hitotsubashi University and TEIKOKU DATABANK LTD at CAREE

Merged Data

- Management score
  - 16 management questions in JP-MOPS
- Productivity
  - Plant-level data from Japanese Census of Manufacture
  - Firm characteristics and accounting data from Teikoku DataBank
- Transactional relationship
  - Transaction partners (i.e., seller and buyer) are identified
  - Number of transaction partners
  - Years of transactional relationship
  - Network characteristic indicators
- Uncertainty
  - Forecast about a value of shipment in 2017 from JP-MOPS
  - Forecast error from JP-MOPS and Japanese Census of Manufactures
  - Forecast variance about a value of shipment in 2018 from JP-MOPS

Management Score and Transaction Partners

	# of Employees			
# of Transaction partners (sellers)	30 to 49	50 to 99	100 to 249	250 above
1 to 4 firms	0.409	0.448	0.505	0.591
5 to 9 firms	0.425	0.478	0.509	0.579
10 to 19 firms	0.456	0.490	0.533	0.602
20 to 49 firms	0.511	0.552	0.545	0.595
50 to 249 firms	0.558	0.561	0.589	0.616
250 firms above	0.585	0.602	0.615	0.650

- For a given category of size, management score is positively correlated with the number of transaction partners

* The results in this page and in the following 6 pages use data from TEIKOKU DATABANK LTD

Management Score and Transaction Years

	# of Employees			
Years of Transactional relationship	30 to 49	50 to 99	100 to 249	250 above
1 to 4 years	0.451	0.492	0.528	0.624
5 to 9 years	0.437	0.476	0.530	0.576
10 to 19 years	0.428	0.470	0.516	0.571
20 years or more	0.380	0.575	0.460	0.675

- For a given category of size, we cannot see a clear pattern of the relationship between management score and the years of transaction relations

Productivity Regressions 1

	DV: Log of Labor Productivity								
	Supplier only				Customer only				
	I		II		III		IV		
Management Score	1.037	***	0.994	***	1.052	***	0.990	***	
	(0.010)		(0.023)		(0.009)		(0.019)		
Years of transactional relationship in the past	0.001	***	-0.004	***	0.0005	***	-0.004	***	
	(0.0002)		(0.001)		(0.0002)		(0.029)		
Management Score x Transaction years			0.010	***			0.006	***	
			(0.002)				(0.002)		
Industry dummy & control	Yes		Yes		Yes		Yes		
No of obs	178,002		178,002		197,705		197,705		
Adjusted R_Squared	0.450		0.128		0.386		0.171		

- The effect of years of transaction relations on labor productivity is negative for low management scores and positive for high management scores

Productivity Regressions 2

	DV: Log of Labor Productivity								
	Supplier only				Customer only				
	I		II		III		IV		
Management score	0.411	***	1.742	***	0.779	***	1.070	***	
	(0.009)		(0.027)		(0.020)		(0.024)		
Number of transaction partners	0.180	***	0.339	***	0.229	***	0.318	***	
	(0.001)		(0.004)		(0.001)		(0.003)		
Management score x Number of transaction partners			-0.304	***			-0.193	***	
			(0.006)				(0.005)		
Industry dummy & control	Yes		Yes		Yes		Yes		
No of obs	178,002		178,002		197,705		197,705		
Adjusted R_Squared	0.546		0.233		0.545		0.326		

- The effect of the number of transaction partners on labor productivity is positive for the range of management scores
- This effect decreases with management scores

Years of Transaction Relation Regressions

	DV: Years of transactional relationship in the future											
	Supplier-Customer pair				Supplier only				Customer only			
	I		II		III		IV		V		VI	
Supplier management Score in 2010	0.130	*	0.220	**	0. 129	***	0.182	***				
	(0.077)		(0.111)		(0.022)		(0.029)					
Customer management Score in 2010	0.190	*	0.279	**					-0.020		-0.027	
	(0.079)		(0.109)						(0.022)		(0.029)	
Years of transactional relationship in the past	0.102	***	0.118	***	0.098	***	0.101	***	0.107	***	0.111	***
	(0.002)		(0.008)		(0.001)		(0.002)		(0.001)		(0.002)	
Transaction years x Supplier MS			-0.011				-0.008	**				
			(0.011)				(0.003)					
Transaction years x Customer MS			-0.020	*							-0.006	*
			(0.011)								(0.003)	
No of obs	12,981		12,981		174,122		174,122		193,438		193,438	
Adjusted R_Squared	0.208		0.199		0.176		0.177		0.202		0.197	

- Management scores are positively associated with the length of transaction relations

Uncertainty Regressions 1

	DV: Weighted Variance of 2018 Forecast about Shipment		
	I	II	III
Management score	-7.47***	-7.187***	-5.255***
	(1.158)	(1.305)	(1.331)
Number of transaction partners			-1.339***
			(0.240)
Average years of transactional relationship			-0.135**
			(0.064)
Industry dummy & control	No	Yes	Yes
No of obs	6719	6719	6719
Adjusted R_Squared	0.202	0.211	0.216

- The forecasting variance is negatively associated with management scores
- The forecasting variance is negatively associated with both the number of transaction partners and the length of transactional relationship

Uncertainty Regressions 2

	DV: DV: Forecast Error Percentage about 2017 shipment		
	I	II	III
Management score	0.107***	0.011	-0.052
	(0.030)	(0.032)	(0.033)
Number of transaction partners			0.065***
			(0.006)
Average years of transactional relationships			-0.006***
			(0.002)
Industry dummy & control	No	Yes	Yes
No of obs	5576	5576	5576
Adjusted R_Squared	0.002	0.04	0.06

- The forecasting error is not associated with management scores (maybe negatively)
- The forecasting error is positively associated with the number of transaction partners
- The forecasting error is negatively associated with the length of transactional relationship

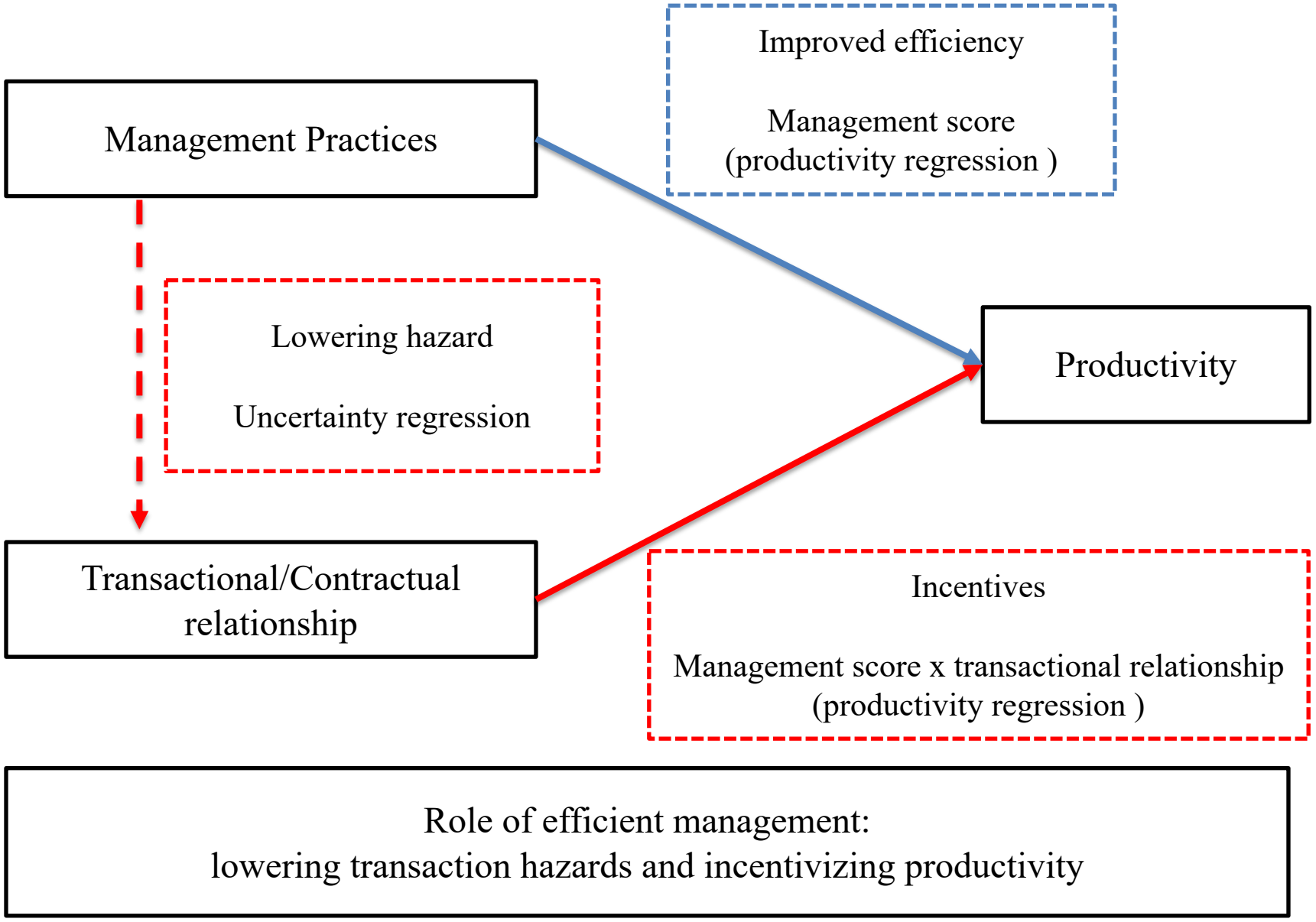
Summary of Preliminary Findings 1

- Management scores are positively associated with labor productivity
- The effect of years of transactional relationship on labor productivity is negative for low management scores and positive for high management scores
  - A role of efficient production management as lowering transaction hazards
- The effect of the number of transaction partners on labor productivity is positive
  - But this effect decreases with management scores
- Management score and stable transactional relationship in the past are positively correlated with the length of transaction relations in the future
  - Efficient production management may contribute to stable transactional relationship

Summary of Preliminary Findings 2

- Management score is negatively associated with the variance of firm's forecasting
  - Efficient production management may reduce a degree of uncertainty ex ante
- Both the length and number of transaction relations are negatively associated with the variance of firm's forecasting
  - Stable and various transactional relationship may reduce a degree of uncertainty ex ante
- Management score and forecasting error relationship
  - Needs to be examined further
- While the length of transaction relations is negatively associated with forecasting error, the number of transaction relations is positively associated with forecasting error
  - Stable transactional relationship may reduce a degree of uncertainty ex post
  - A wide variety of transactional relationship may increase a degree of uncertainty ex post

Preliminary Findings and Main Story



Future Direction

- The hypothesis must be sharpened and separated from inter-firm learning and selection stories
  - Use group-firm variation
- Incentive issues must be tested by data
- Identification issues
  - any suggestion is appreciated
- Measurement issues
  - Forecast error
  - TFP
  - Network