Testing Heterogeneous Currency Exchange Rate Pass-through: Evidence from Firm-Level Cotton Yarn Export Data

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"Internationalization of firms in the industry life cycle"

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1-1. Introduction: "Pass-through 101"

- Currency exchange rate ⇒ export price measured in ***X*** (e.g., ***yen***)

E.g., $\log(\textit{yen export price}) = \alpha + \beta \log(\textit{yen/USD}) + \varepsilon$

⇒ $\beta \fallingdotseq 0$: Complete pass-through

⇒ $\beta \fallingdotseq 1$: No pass-through

- "Incomplete" pass-through: $\beta \neq 0$

1-2. Introduction: Some backgrounds

- Well known **"incomplete"** pass-through phenomenon
  - ⇒ Exactly what?
- Potentially many firm-level **"heterogeneity"**
  - Price level, market share, product quality, import intensity & market share
    - ⇒ Selected factors separately examined?
- Less than **"ideal"** data for examining specific mechanisms
  - Aggregate data or unit value
    - ⇒ Still coarse & not interacted w/ firm-level heterogeneity?

2. This paper

- **Ideal data**
  - Narrowly defined & differentiated product
  - Cotton yarn in a specific count: "16-bante"

    ⇒ Even better than Fitzgerald & Haller (2014): SIC 8 digit-level

    (E.g., 22810302: COTTON YARN, SPUN)

  - High frequency (monthly) firm-level export price data
  - Exogenous currency exchange rate dynamics

- Pinning down ***"financial cost"* channel** with controlling for a comprehensive list of other firm attributes

⇔ **Historical but unparalleled data** (Braguinsky et al. AER 2015)

3. Key takeaways

- Low unconditional pass-through rate (⇔Fitzgerald & Haller 2014)

- Pass-through depends on…
  - TFP, firm size, import intensity, labor skill (⇔Product quality), as in the extant studies

- Pass-through also depends on ***"financial cost"*** factor …
  - Proxied for by Inventory turnover

⇒ **First analysis** employing **ideal price data** to pin down **financial cost factor** affecting pass-through with controlling for a list of comprehensive firm attributes

4-1. Literature: "Mark-up" channel

- Larger β when…
  - Lower price (⇔higher TFP: Melitz & Ottaviano *RES* 2008; Berman et al. *QJE* 2012)
  - Higher market share (Atkeson & Burstein *AER* 2008)
  - Higher product quality (Baldwin & Harrigan *AEJ-Micro* 2011)

← Lower demand elasticity

⇔ Higher **mark-up** elasticity ⇔ Lower pass-through

4-2. Literature: "Marginal cost" channel

- Larger β when…
  - Higher import intensity of intermediate goods (Amiti et al. *AER* 2014)
  - Central product (Chatterjee et al. *AEJ-Policy* 2013)
  - Higher local distribution cost share (Corsetti & Dedola *JIE* 2005)
  - Higher productivity (Berman et al. *QJE* 2012)

← Higher **marginal cost** elasticity

⇔ Higher elasticity of home currency-measured price

⇔ Lower pass-through

4-3. Literature: Some new angles…

- Employ some of them jointly…
  - Amiti, et al. (*AER* 2014): (i) Firms w/ larger market share and/or (ii) firms w/ higher import intensity shows larger mark-up dynamics (⇔ lower pass-through)

- Attempting to claim something new…
  - Strasser (*JME* 2013): Financially constrained firms pass-through the change in exchange rate more

← Gopinath (*JME* 2013): "*important to* ***control for other firm level factors*** *before attributing causation to financial friction*"

5-1. Data: Firm-month export price

- Hand-collected from industry report (*Geppo*: 大日本紡績連合会月報)
- Monthly frequency firm-level export price data
- 1897/5～1898/6, 1901/10, 1902/4～1903/12, 1911/6～1914/12
  - ⇒ Note: The gold standard was introduced in 1897
  - ⇒ Note: Periods associated with major events (e.g., The Boxer Rebellion, Japan-Russo war) are excluded
- Firm ID, count-level (e.g., 16, 20, etc.) export price
  - For each firm × count, we have max (highest reported prices in each month), min (lowest in each month), avr (average price in each month)
  - Mainly 16 and 20 count data are available (also 10, 12, and 14)
  - Price information from China and Indian producers are also available
- Domestic price (製糸十六番手一梱平均代価)
- Export quantity (16 and 20 count: converted to 梱数)
- Many missing data on export quantity (even when prices are reported)
- Mumbai price is also partially available

Note: 22, 23, 24, 30, 32, 40, 41, 42, 60, and 80 counts were actually produced

雲龍魁玉の類には一匁高を以て當地紡績筋に數千俵先物約定出來たる爲め各銘物にも一般一二匁高直相場を示し從て實棉も五匁方騰貴を見るに至れり通州物南北雜牌類にも一般在荷薄の事なれは氣配强氣を含み尚一段上進もせさらん現況なり

今本日の出來直を上れは左の如し

品銘		出來直	品銘		出來直
通州器械繰別上		七、三〇	上海器械繰上長崎向六片入		一六、二〇
仝	上等	七、〇〇	仝 横濱中等仝		一六、二〇
仝	中等	一六、二〇	上海製通州器械繰上等		七、〇〇
仝	下等	一六、二〇	仝	中等	一六、二〇
上海器械繰雲錦		—	寧波器械繰バース附上等		一六、二〇
仝	雲龍	一七、一〇	仝	中等	一六、三〇
仝	錦玉	一六、二〇	仝	下等	一六、三〇
仝	白雪	一六、二〇	通州實綿	一號	六、三〇
仝	魁玉	一七、〇〇	仝	二號	六、四〇
仝	雪錦	一六、二〇	上海仝女姑	一號	六、四〇
仝	上一品	一六、二〇	仝	二號	六、三〇
仝南北雜牌別上		一六、二〇	仝	高庄	六、三〇
仝	上等	一六、四〇	仝	抄庄	六、一〇
仝	中等	一六、一〇	寧波仝	一號	六、三〇
仝	下等	一六、〇〇	仝	二號	六、一〇

次に本週中に於ける取組高を上れは左の如し

通州器械繰別上	三五〇	上海器械繰南北雜牌別上
上海器械繰雲龍	二〇〇	仝 上等

（六月十日報）

○其三

本週に於ける棉花市況は前報の如く當地紡績筋の當用口の望取にして買進まさるも賣人筋には在荷薄且つ實綿高直引締め居相場保合居るも需用筋には一般相場不引合を唱へて望取薄昨今の氣配稍や引緩み茲或は下落を見るやも不斗景況にして本週の取組は當地紡績筋及び儘々の牛耳筋の手合とす

今日の出來直は前報と仝樣に附き省略す而して本週間に於ける取組高を上れは左の如し

上海器械繰雲龍	六五〇	寧波器械繰バース附中等
仝 雪錦	二〇〇	仝 下等
仝南北雜牌上等	三〇〇	
仝 中等	一〇〇	

上海綿糸商況　申興洋行報

（四月廿二日報）

○其一

本週中本邦糸の商況は前週に於て天津其他北淸筋の望取ありし爲め多少の氣配も見直し居りしも其後は各當用筋共更に買進まさん摸樣もなく依然少數の手合に止ま

り買人筋は安附口の儘見送りの姿にて氣配も頓と引立ち兼品に依り二匁五分乃至五匁安にて手合出來居れり尚引續き需用薄には多少の下押は有之るが如き現況にて本週の取組高は二百三十餘俵にして在荷高は六千〇六十餘俵なり其相場は左の如し

日本糸十六手 二十手			上海糸十四手 十六手		
大阪象	七、三〇	茂生	七、三〇	七、三〇	
平野馬	七、三〇	怡和	七、〇〇	七、三〇	
堀津孔雀	七、三〇	端記	七、〇〇	七、三〇	
鐘淵魚	七、三〇	老公茂	七、〇〇	七、三〇	
東京牡丹	七、二〇	協隆	七、〇〇	七、三〇	
仝金獅子	七、二〇	裕源	七、〇〇	七、三〇	
朝日双鹿	七、二〇	大純	七、〇〇	七、三〇	
岡山花蝶	七、二〇	華盛	六、九〇	七、〇〇	
三池三管	七、一〇	新	六、九〇	七、〇〇	
浪花塔象	七、一〇	上	六、九〇	七、〇〇	
泉州戎	七、一〇	中	六、八〇	七、〇〇	
玉島和合人	七、一〇	中以下	六、七〇	六、九〇	
金巾花瓶	七、一〇	十手			
備前伏龍	七、一〇	上	六、八〇		
岸和田	七、〇〇	中	六、七〇		
天滿	七、〇〇	中以下	六、六〇		
尼ケ崎	七、〇〇				
七星	七、〇〇				

次に本週中取組高を上れは左の如し

日本糸	十六手	一〇	上海糸十六手 二十手		孟買糸
	二十手	九〇	大阪象	七、三〇	茂生	七、三〇	二十手
孟買糸	十手	八五一	平野馬	七、三〇	怡和	七、〇〇	上	七、三〇
	十六手	三五〇	堀津孔雀	七、三〇	端記	七、〇〇	中	七、〇〇
	二十手	五五五	鐘淵魚	七、三〇	老公茂	七、〇〇	中以下	六、九〇

（五月廿七日報）

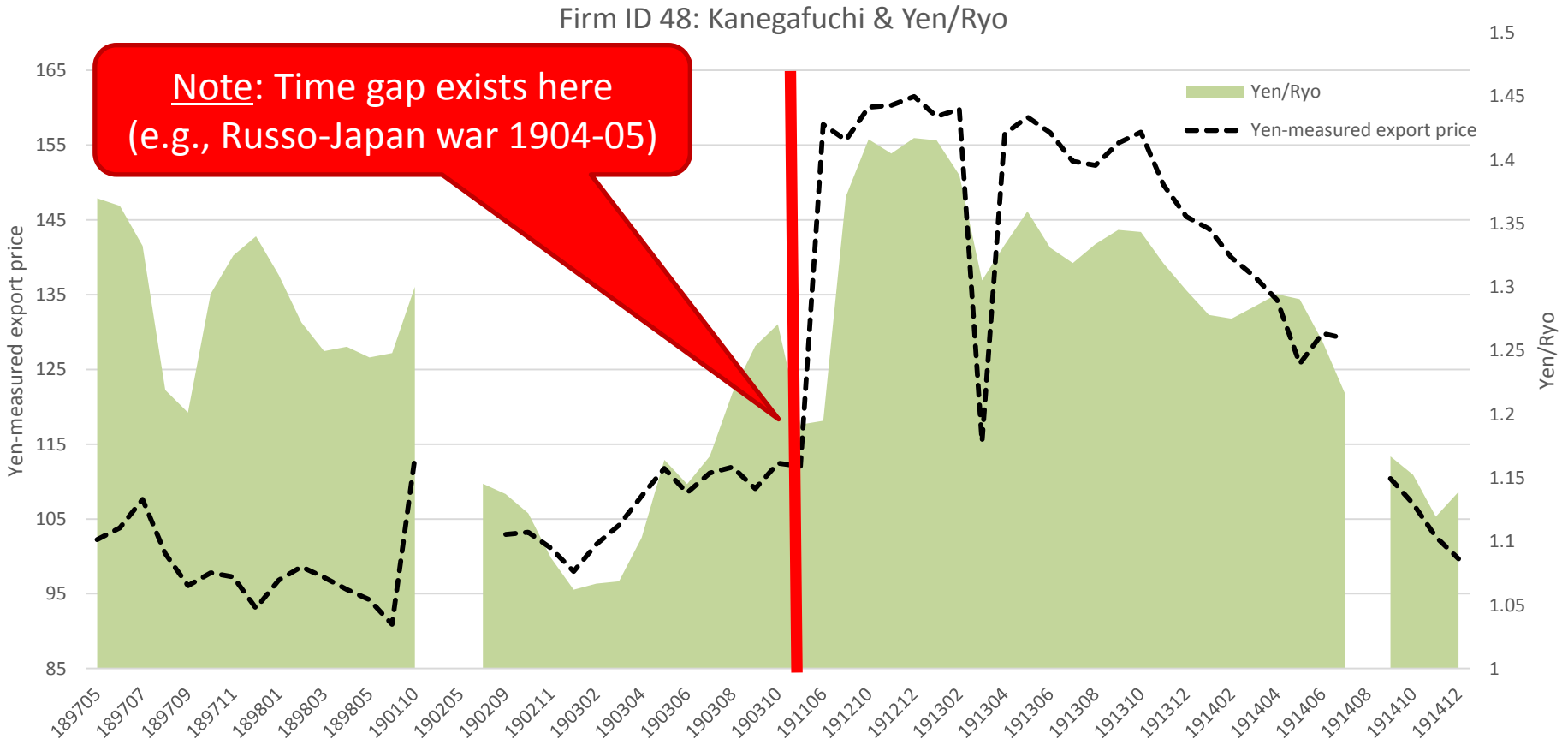
○其二

本週中糸況は本邦糸に於ては前報仝樣引續き少數の手合に止り至て需用薄昨今の處相場亂調子とも云ふか如き傾向在りて左記相場より二匁五分乃至品に依り七匁五分方安直を以て儘少の手合を生し市勢何となく賣濕り買濕りの狀態にて相場は更に一定せす買人筋には本邦安直を氣搆への向も在りて一向買進まさる等手控へ同樣の姿勢にて相場見送り居り賣人筋に於ても今後の動靜如何を氣遣ひ相場見送り居りて尚引續き不捌にて勢ひ不況を呈すべきやも不計現況なり而して其在荷は日本糸五千三百四十俵、印度糸二萬俵なり其相場は左の如し

日本糸十六手 二十手			上海糸十六手 二十手		孟買糸
大阪象	七、三〇	茂生	七、三〇	二十手	
平野馬	七、三〇	怡和	七、〇〇	上	七、三〇
堀津孔雀	七、三〇	端記	七、〇〇	中	七、〇〇
鐘淵魚	七、三〇	老公茂	七、〇〇	中以下	六、九〇
東京牡丹	七、二〇	協隆	七、〇〇	十六手	

5-2. Data: Currency exchange rate

- Data book of Japanese economic statistic (日本経済統計総観)
- Monthly frequency ***yen***/***ryo***(Chinese currency) exchange rate
  - Highest, lowest, average (used in our analysis) for each month



5-3. Data: Firm characteristics

Note: Production data are handled to compute TFPQ by following Braguinsly et al. (AER 2015)

- Firm characteristics
  - *Geppo* & financial statement (考課状)
  - Items included in the data
    - Output: Measured in physical units for two machinery (ring & mule)
    - Capital: Two-types of machinery, operating hours & days, power source
    - Labor: Male & female w/ wage information
    - Intermediate good: Cotton & coal
    - Cotton sources: Japan, China, India, US, HK, Vietnam, Egypt, others
    - Product composition: Share of 16 & 20 counts out of total production
    - Location: All the plants (with detailed information)
    - Almost all the P/L & B/S items (e.g., inventory, sales)
    - Firm age, board member, managers' attributes (e.g., education), plant-level attributes, entry/exit (firm & plant) ⇒ Planning to use…

⇒ At most, 32 firms × 57months (max #obs = 517 in the current analysis)

5-4. Data: Summary stat (a) - (c)

Variable	Definition	Obs	Mean	Std. Dev	Min	Max
	Sample (a): Sample for Table 2					
P	Natural logarithm of Yen(i.e., home currency)-measured 16-bante cotton exported	436	4.67	0.16	4.05	5.08
ER	Exchange rate measured as units of yen per one ryo	436	0.21	0.08	0.06	0.35
TFP	Firm-level total factor productivity obtained from fixed-effect panel estimation	436	0.00	0.13	-0.36	0.45
	Sample(b): Sample for Table 3					
P	Natural logarithm of Yen(i.e., home currency)-measured 16-bante cotton exported	353	4.67	0.16	4.46	5.08
ER	Exchange rate measured as units of yen per one ryo	353	0.22	0.07	0.06	0.35
TFP	Firm-level total factor productivity obtained from system GMM estimation	353	0.00	0.12	-0.33	0.34
	Sample(c): Sample for Table 4					
P	Natural logarithm of Yen(i.e., home currency)-measured 16-bante cotton exported	353	4.67	0.16	4.46	5.08
ER	Exchange rate measured as units of yen per one ryo	353	0.22	0.07	0.06	0.35
TFP	Firm-level total factor productivity obtained from fixed-effect panel estimation	353	0.01	0.13	-0.33	0.45
WAGE	Natural logarithm of female worker wage	353	0.00	0.29	-0.49	0.58
SIZE	Natural logarithm of output	353	0.06	1.14	-2.48	2.68

Note: All the variables other than IMPORT is demeaned

5-5. Data: Summary stat (d)

Sample(d): Sample for Table 5						
P	Natural logarithm of Yen(i.e., home currency)-measured 16-bante cotton exported	189	4.68	0.17	4.51	5.08
ER	Exchange rate measured as units of yen per one ryo	189	0.21	0.07	0.06	0.35
TFP	Firm-level total factor productivity obtained from fixed-effect panel estimation	189	0.02	0.13	-0.31	0.43
WAGE	Natural logarithm of female worker wage	189	0.06	0.28	-0.43	0.53
SIZE	Natural logarithm of output	189	0.26	1.23	-2.48	2.68
IMPORT	Import from Ryo export source countries / Import from all the souces (Note: this variable is time-invariant and measured as of the initial appearance in the data)	189	4.46	20.60	-39.67	39.23
INVENTORY	(Inventory + Account receivable) / Sales	189	-0.01	0.08	-0.09	0.26
RATE	BOJ's discount rate	189	-0.15	0.64	-1.05	1.14
SHARE	Output share of 16 count cotton yarn	189	0.02	0.24	-0.42	0.55
CAPUTIL	Capuital utilization rate	189	-0.01	0.14	-0.41	0.51

6-1. Theoretical underpinning

- The standard expression of export price
  - Gopinath (JME 2013)

$$P_i = \{1 + \mu_i\} MC_i$$

where

P_i: Firm-i's home currency (i.e., *yen*)-measured export price

$\mu_i(P_i/ER\,, w_i)$: Mark-up of firm-i where w_i is firm-i's attributes

$MC_i(ER, z_i)$: Home currency-measured marginal cost of firm-i where z_i is firm-i's attributes

6-1. Theoretical underpinning

- Sketch: General mechanism with local (=Ryo, e.g., distribution) cost

Suppose Yen depreciates

⇒ Share of final consumption price depending on export price falls

⇒ This reduces the elasticity of demand perceived by exporters to their export price

⇒ Induce exporters to increase mark-up on average

6-1. Theoretical underpinning

□ With heterogeneous variable inventory/financial cost

For firms facing higher variable inventory cost (⇔higher inventory turnover), a larger share of their final consumption price depends on the export price

⇒ Perceived elasticity of demand to the export price increases with such higher inventory cost

⇒ Mark-up of firms with higher inventory cost can be increased by less than that of firms with lower inventory cost in response to depreciation

⇔ **Lager financial cost** leads to smaller domestic price dynamics (i.e., higher pass-through)

6-2. Bring it to estimation

Focus on the observation with some price change (⇔ Nakamura & Steinsson 2012)

(i) Fixed-effect panel estimation:

$$\ln P_{i,t} = \alpha + \beta_1 \ln ER_t + \beta_2 x_{i,t} + \beta_3 \ln ER_t \times x_{i,t} + FE_i + \varepsilon_t$$

(ii) Allison's hybrid random-effect estimation (Allison 2009)

$$\ln P_{i,t} = \alpha + \beta \ln ER_t + \gamma_1 (x_{i,t} - \bar{x}_i) + \gamma_2 \bar{x}_i + \delta_1 \left\{ \ln ER_t \times x_{i,t} - \overline{\ln ER \times x_i} \right\} + \delta_2 \overline{\ln ER \times x_i} + RE_i + \varepsilon_t$$

(iii) Correlated coefficient random-effect estimation (Wooldridge 2010)

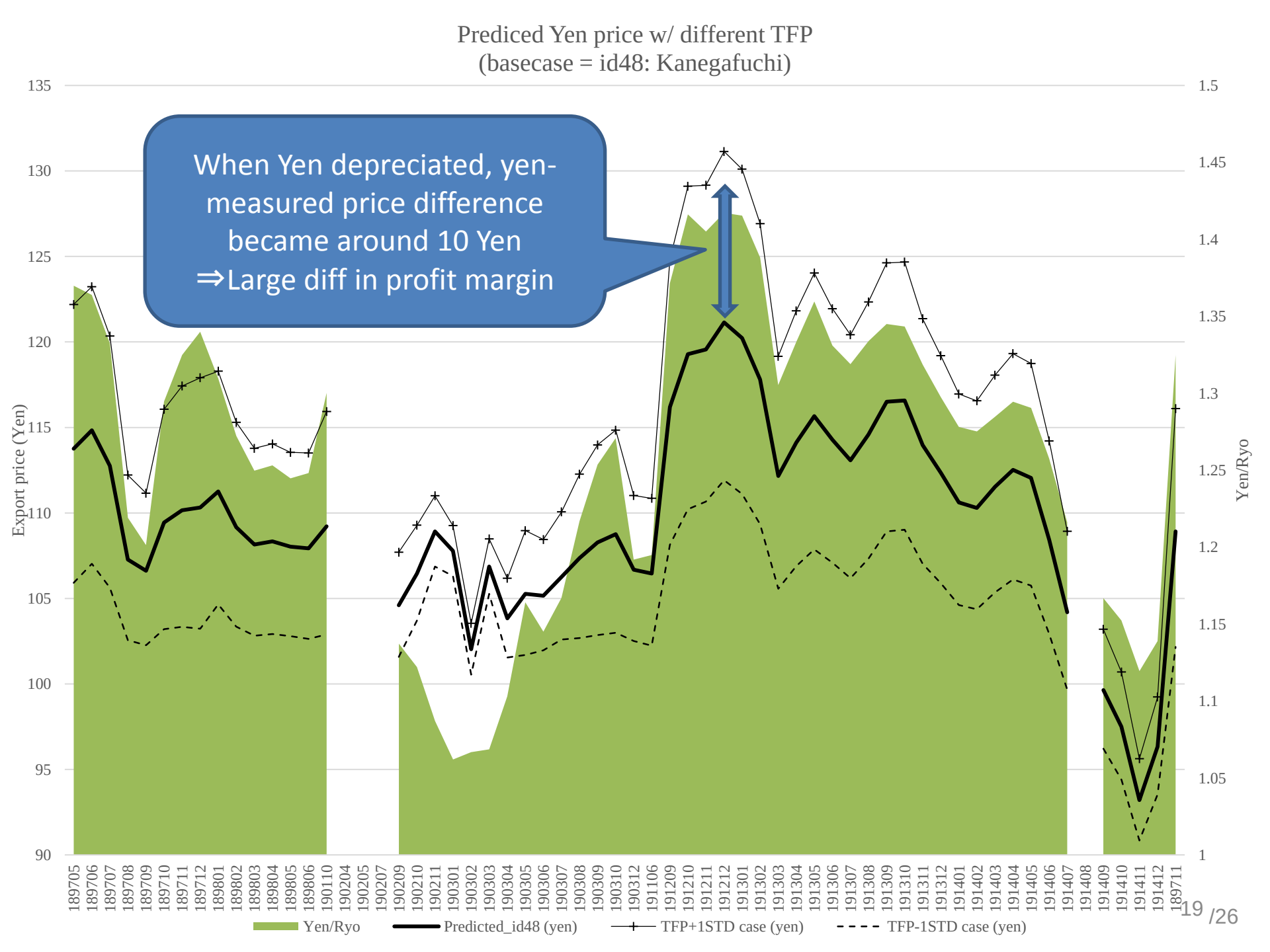
$$\ln P_{i,t} = \alpha + \beta \ln ER_t + \gamma_1 x_{i,t} + \gamma_2 \bar{x}_i + \delta_1 \ln ER_t \times x_{i,t} + \delta_2 \overline{\ln ER \times x_i} + RE_i + \varepsilon_t$$

7-1. Empirical analysis: Unconditional & TFP

Dependent variable: *P*										
	Fixed-effect model			Fixed-effect model			Allison (2009) Hybrid random-effect model			Correlated random-effects model		
Independent Variables	Coef.	Std. Err.		Coef.	Std. Err.		Coef.	Std. Err.		Coef.	Std. Err.	
ER	1.067	0.070	***	1.024	0.068	***				1.019	0.068	***
TFP				-0.400	0.150	***				-0.407	0.149	***
ER×TFP				1.748	0.629	***				1.786	0.628	***
ER - ER_AVR							1.019	0.068	***			
TFP - TFP_AVR							-0.407	0.149	***			
ER×TFP - ER×TFP_AVR							1.786	0.628	***			
ER_AVR							-0.118	0.346		-1.137	0.352	***
TFP_AVR							-0.131	0.628		0.276	0.640	
ER×TFP_AVR							0.486	2.788		-1.300	2.831	
constant	4.462	0.016	***	4.451	0.015	***	4.643	0.072	***	4.643	0.072	***
No. of Obs.	517			436			436			436		
No. of Groups	32			30			30			30		
Observation per group												
min	1			1			1			1		
avr	16.2			14.5			14.5			14.5		
max	57			57			57			57		
F or Wald chi2	231.55			76.79			227.30			227.30		
Prob > F or chi2	0.0000			0.0000			0.0000			0.0000		
R-sq												
within	0.3236			0.3637			0.3637			0.3637		
between	0.0047			0.0044			0.0136			0.0136		
overall	0.2074			0.1767			0.1791			0.1791		
corr(u_i, xb)	-0.0870			-0.1267			0 (assumed)			0 (assumed)		
F test that all u_i=0												
F	12.93			18.61			n.a.			n.a.		
Prob>F	0.0000			0.0000			n.a.			n.a.		

Almost same magnitude reported in Fitzgerald & Haller (2014) i.e., β=1.01 (std. 0.090)***

Fitzgerald & Haller (2014) "meets" Berman et al. (2012) i.e., depends on firm characteristics


Prediced Yen price w/ different TFP
(basecase = id48: Kanegafuchi)
When Yen depreciated, yen-measured price difference became around 10 Yen
⇒Large diff in profit margin
Export price (Yen)
Yen/Ryo
Yen/Ryo
Predicted_id48 (yen)
TFP+1STD case (yen)
TFP-1STD case (yen)

7-2. Empirical analysis: Another TFP measure

- Robust to alternative TFP computation

Dependent variable: *P*									
	Fixed-effect model			Allison (2009) Hybrid random-effect model			Correlated random-effects model		
Independent Variables	Coef.	Std. Err.		Coef.	Std. Err.		Coef.	Std. Err.	
ER	1.016	0.076	***				1.012	0.076	***
TFP	-0.469	0.187	**				-0.480	0.187	***
ER×TFP	2.529	0.789	***				2.573	0.791	***
ER - ER_AVR				1.012	0.076	***			
TFP - TFP_AVR				-0.480	0.187	***			
ER×TFP - ER×TFP_AVR				2.573	0.791	***			
ER_AVR				-0.321	0.495		-1.333	0.501	***
TFP_AVR				-0.280	1.103		0.200	1.116	
ER×TFP_AVR				1.690	4.827		-0.883	4.881	
constant	4.449	0.017	***	4.686	0.106	***	4.686	0.106	***

7-3. Empirical analysis: Full model

① Female wage (⇔quality)
② Import intensity
③ **Inventory turnover (⇔*"financial cost"*)**
④ BOJ discount rate (sign???)

t variable: *P*

Independent Variables	Fixed-effect model								
	Coef.	Std. Err.		Coef.	Std. Err.		Coef.	Std. Err.	
ER	0.272	0.090	***	0.691	0.065	***	1.078	0.127	***
TFP	-0.166	0.142		-0.079	0.108		-0.035	0.122	
ER×TFP	0.200	0.686		-0.482	0.480		-0.144	0.585	
WAGE	-0.219	0.079	***	-0.315	0.068	***	-0.045	0.072	
ER×WAGE	1.511	0.384	***	2.149	0.328	***	1.067	0.339	***
SIZE	0.037	0.019	*	0.058	0.017	***	0.071	0.017	***
ER×SIZE	0.174	0.081	**	0.108	0.073		0.033	0.071	
ER×IMPORT	0.018	0.003	***	0.015	0.003	***	0.010	0.003	***
INVENTORY	0.985	0.376	***				0.728	0.322	**
ER×INVENTORY	-7.053	1.682	***				-4.604	1.467	***
RATE				-0.072	0.015	***	-0.191	0.024	***
ER×RATE				0.324	0.073	***	0.777	0.109	***
constant	4.575	0.018	***	4.497	0.014	***	4.392	0.028	***

7-4. Empirical analysis: Asymmetry of Δ*ER*

Dependent variable: *P*									
	Fixed-effect model								
	All			ER ↑ (Yen dereciation)				ER ↓ (Yen appreciation)	
Independent Variables	Coef.	Std. Err.		Coef.	Std. Err.		p-value	Coef.	Std. Err.	
ER	1.078	0.127	***	0.863	0.113	***	0	-0.088	0.648	
TFP	-0.035	0.122		-0.018	0.104		0.866	0.738	0.418	*
ER×TFP	-0.144	0.585		0.153	0.529		0.774	-4.001	1.912	**
WAGE	-0.045	0.072		-0.108	0.063	*	0.092	-0.302	0.282	
ER×WAGE	1.067	0.339	***	1.472	0.298	***	0	1.944	1.338	
SIZE	0.071	0.017	***	0.075	0.015	***	0	0.123	0.059	**
ER×SIZE	0.033	0.071		0.024	0.058		0.683	-0.181	0.272	
ER×IMPORT	0.010	0.003	***	0.008	0.003	***	0.001	0.031	0.011	***
INVENTORY	0.728	0.322	**	0.708	0.277	**	0.013	3.308	1.081	***
ER×INVENTORY	-4.604	1.467	***	-4.300	1.213	***	0.001	-17.42	5.303	***
RATE	-0.191	0.024	***	-0.125	0.025	***	0	-0.055	0.089	
ER×RATE	0.777	0.109	***	0.568	0.115	***	0	0.170	0.385	
constant	4.392	0.028	***	4.468	0.026	***	0	4.616	0.137	***

7-5. Empirical analysis: Robustness

Dependent variable: *P*

Independent Variables	Coef.	Std. Err.		Coef.	Std. Err.		Coef.	Std. Err.	
ER	1.033	0.134	***	0.724	0.144	***	0.720	0.156	***
TFP	-0.078	0.131		-0.022	0.121		-0.068	0.128	
ER×TFP	0.171	0.615		-0.412	0.575		-0.136	0.601	
WAGE	-0.010	0.079		-0.042	0.070		-0.025	0.078	
ER×WAGE	0.818	0.372	**	1.061	0.340	***	0.883	0.378	**
SIZE	0.058	0.030	*	0.073	0.017	***	0.086	0.032	***
ER×SIZE	0.061	0.078		0.071	0.072		0.070	0.079	
ER×IMPORT	0.012	0.003	***	0.014	0.003	***	0.014	0.004	***
INVENTORY	0.669	0.328	**	0.882	0.322	***	0.891	0.336	***
ER×INVENTORY	-4.350	1.502	***	-5.796	1.524	***	-5.397	1.593	***
RATE	-0.186	0.026	***	-0.186	0.024	***	-0.182	0.026	***
ER×RATE	0.752	0.112	***	0.647	0.111	***	0.652	0.115	***
ER_R				0.211	0.616		0.078	0.648	
ER_R×IMPORT_R				-0.025	0.030		-0.035	0.037	
ER_D				7.407	1.630	***	6.965	1.687	***
ER_D×IMPORT_D				0.131	0.071	*	0.150	0.081	*
ER_S				-5.082	1.383	***	-5.043	1.432	***
ER_S×IMPORT_S				-0.705	0.694		-0.610	0.704	
constant	0.273	2.282		-3.808	1.991	*	-6.384	2.883	**
Prefecture control		yes			no			yes	
Other currency exchange rates		no			yes			yes	

7-6. Empirical analysis: Further robustness

- Incorporate and consider additional factors:
  - Interaction b/w exchange rate & centrality of 16 count: (+/-) but insig
    - ⇔ Chatterjee et al. (2013): Pass-through rate for non-centered product is high (i.e., central product shows larger β)
    - ⇔ Also, related to "**urgency**" channel (i.e., products associated w/ less efficient/flexible production (e.g., non-central)⇔ high pass-through
  - Interaction b/w exchange rate & **1**(early entry to export market): (+) but insig
    - ⇔ Early entrant has some market power
  - Interaction b/w exchange rate & **1**(headquartered in Tokyo): (+) but insig
    - ⇔ Distribution cost as in Berstein & Jaimovich (2012)?
  - Exclude the periods for WWI (July 1914～)

⇒ Results in "full model" are robust to the inclusion of these items

8. Things to be done

- "To do list" in the appendix

- Esp., further precise picture:
  - Financial friction proxied for by "**link to funding sources**" information and/or "**Leverage × BOJ rate**" etc.
  - Export quantity: Extensive margin (i.e., truncated data structure ⇔ selection), residual demand faced by individual firms

- Some additional robustness checks:
  - Use domestic price (exporter and non-exporter firms) as a benchmark
  - Dynamic (time-variant) aspect of incomplete pass-through

9. Conclusion

- Use the ideal data and confirm heterogeneous pass-through in a comprehensive way: Product quality, import, financial cost

- Hopefully, go deeper into financial/management aspects…

- Other projects using this data

  - Pre-export investment (i.e., tangibles & intangibles)

  - Pre-export & post-export productivity/profitability dynamics

  - Utilizing network information more intensively

Thank you and comments are welcome!

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