The background of the slide is a collage of Japanese banknotes. At the top, there are 10,000 yen notes with the text '一万円' (10,000 yen) and '日本銀行' (Bank of Japan). Below this, a green banner contains the title and author information. At the bottom, there are 5,000 yen notes with the text '五千円' (5,000 yen) and '日本銀行', and a 10,000 yen note featuring the portrait of Emperor Meiji. The text '12039' is visible on the right side of the top right note.

Multinationality and cash holdings: Evidence from Japan

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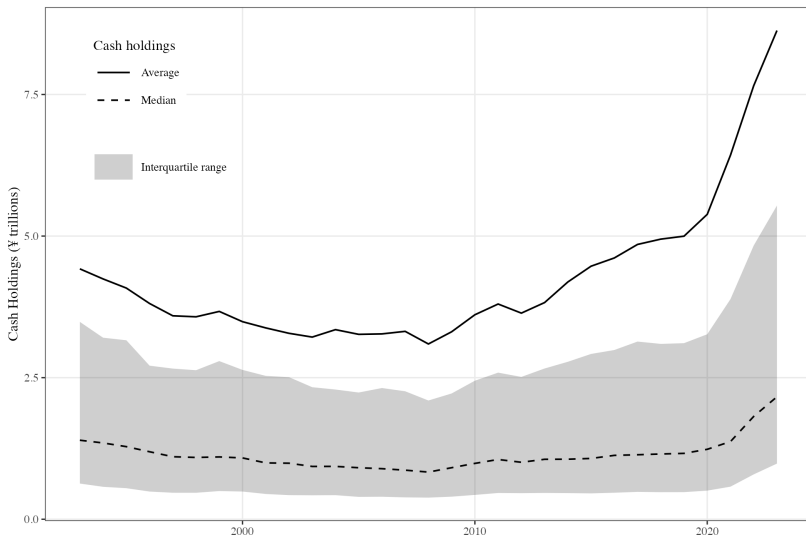
Nippon Finance Association 6th Fall Research Conference

Fukuoka, 9 November 2024

The Punchline

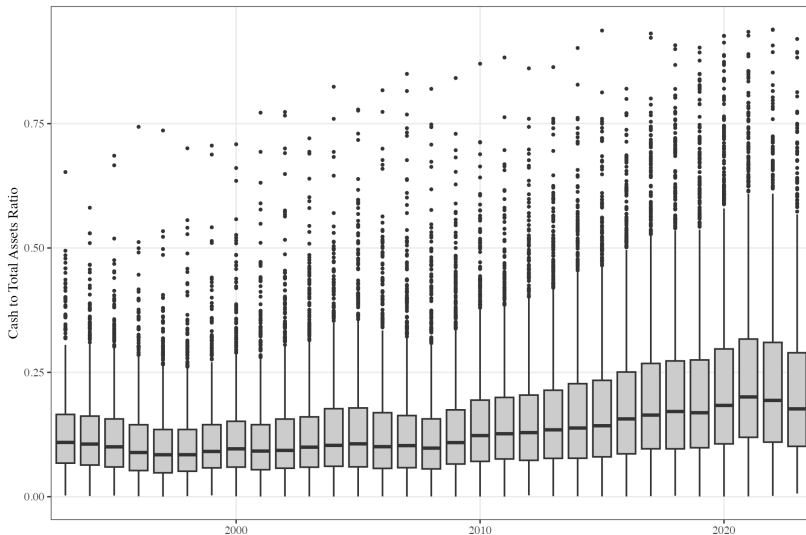
- Corporate cash holdings have been rising around the world, including in Japan.
- Transactions, precautionary and agency motives incentivise firms to hold cash.
- Does “multinationality” have an impact on precautionary cash holdings?
 - Overseas sales, foreign ownership
 - Cultural heterogeneity between parent and overseas affiliates
- Cash holdings are positively related to overseas sales within- and between-firm, but negatively related to foreign ownership within-firm.
- Some cultural differences matter: cash holdings are positively related within-firm to power distance, individualism – collectivism, uncertainty avoidance, long-term orientation.

The cash holdings of Japanese firms have risen



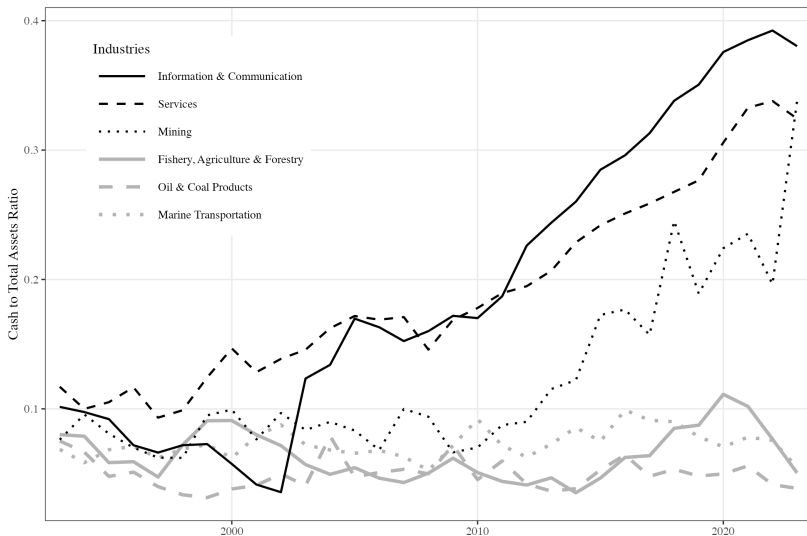
Tokyo Stock Exchange Prime (First) Section firms.

As has the cash to total assets ratio



Tokyo Stock Exchange Prime (First) Section firms.

But substantial cross-sectional variation



Tokyo Stock Exchange Prime (First) Section firms.

Related literature, culture and cash holdings

- Culture (Guiso et al., 2006): “those customary beliefs and values that ethnic, religious, and social groups transmit fairly unchanged from generation to generation.”
- Chang and Noorbakhsh (2009): U.S. firms' cash holdings positively related to home country uncertainty avoidance, masculinity and long-term orientation.
- Chen et al. (2015): Firms' cash holdings negatively associated with individualism, positively associated with uncertainty-avoidance through the precautionary motive.
- So and Zhang (2022): U.S. multinational firms' cash holdings positively associated with cultural heterogeneity between parent and subsidiaries.

Hypotheses

- *H1: Cash holdings are positively associated with the ratio of **overseas to total sales (OSNS)**.*
 - Cash flow, exchange rate, political and corporate risks. Financial constraints.
- *H2: Cash holdings are positively associated with the degree of **foreign ownership (FSHR)**.*
 - High liquidity stocks favoured by foreign investors have greater crash risk.
- *H3: The cash holdings of Japanese multinational firms are positively associated with their **cultural heterogeneity (CH)**.*
 - Management challenges, information asymmetry, financial constraints, corporate risks, potential agency costs.

$$CASH_{i,t} = \alpha + \beta_1 OSNS_{i,t} + \beta_2 FSHR_{i,t} + \beta_{3,d} CH_{d,i,t} \\ + \delta CONTROLS_{i,t} + \gamma COUNTRY_{i,t} + \phi INDUSTRY_{k,t} + \epsilon_{i,t}$$

- Two measures of (consolidated) cash holdings:
 - Natural log (LCASH), cash to total assets (CATA).
- Firm-level financial controls:
 - Size, market-to-book, cash flow to total assets, cash flow volatility, net working capital to total assets, leverage to total assets, capital expenditure to total assets, R&D expenditure to total assets, acquisitions to total assets, payout to total assets, number of business segments.
- Country-level controls:
 - Financial development index (IMF FDI) and corporate taxation differential with Japan.
- Industry fixed effects.

Econometric approach

- Random effects within-between regression (REWB) developed from the work of Mundlak (1978).

$$y_{i,t} = \alpha + \beta_W (x_{i,t} - \bar{x}_i) + \beta_B \bar{x}_i + \delta_B z_i + \mu_i + \epsilon_{i,t}$$

- Researchers usually estimate pooled OLS or fixed effects.
- REWB is more general model than random or fixed effects.
- Important advantage is that REWB allows for the joint estimation of within-firm and between-firm effects.
- “REWB helps avoid the **RE versus FE false dichotomy** often discussed by scholars. Practitioners should consider estimating an REWB model to determine whether there are separate within and between effects to uncover.” (Jordan and Philips, 2022)

- Japanese firms listed on the Prime (First) Section of the Tokyo Stock exchange, excluding financial and utilities firms, Japan Post Holdings, firm-years with missing data.
- Unbalanced panel for January 2014 to December 2023.
- Overseas affiliate data obtained by machine reading firms' Annual Securities Reports (有価証券報告書, Yukashouken Houkokusho or Yuho) downloaded via the EDINET API.
- Cultural dimensions indices from Geert Hofstede's website.
- Firm-level financial data from Nikkei NEEDS.
- Financial development from the IMF, corporate tax rates from the Tax Foundation.

Obtain overseas affiliates from firms' ASRs

- ASR Section 1(4) provides information on affiliates.
- EDINET provides 10 years of past ASR for all listed firms.
- Obtain ASRs (csv files) via EDINET API and extract the overseas affiliate text block.
- Use textual analysis to record the countries where each firm has at least one subsidiary.
- Example, one page of the Toyota Motor Section 1(4) PDF version (name, location, investment, business details, percentage of voting rights held, and other information).

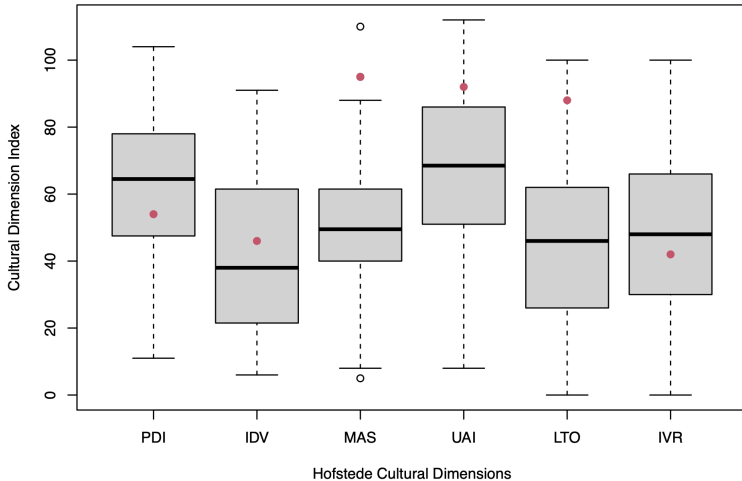
EDINET提出書類
トヨタ自動車株式会社(00204)
有価証券報告書

名称	住所	資本金又は 出資金	主要な 事業 の内容	議決権の 所有 割合(%)	関係内容
トヨタ モーター マニュファクチャリング テキサス㈱ *1	San Antonio, Texas, U.S.A.	千ドル 510,000	自動車	100.00 (100.00)	当社製品の販売。
トヨタ モーター クレジット㈱ *1 *2	Plano, Texas, U.S.A.	千ドル 915,000	金 融	100.00 (100.00)	当社製品にかかる販売金融。
トヨタ ファイナンス サービス㈱ パンク㈱	Henderson, Nevada, U.S.A.	千ドル 1	金 融	100.00 (100.00)	
カナダトヨタ㈱	Toronto, Ontario, Canada	千ドル 10,000	自動車	51.00 (100.00)	当社製品の販売。
トヨタ モーター マニュファクチャリング カナダ㈱ *1	Calderdale, Ontario, Canada	千ドル 690,000	自動車	100.00 (100.00)	当社製品の販売。
トヨタ クレジット カナダ㈱	Markham Ontario, Canada	千ドル 60,000	金 融	100.00 (100.00)	当社製品にかかる販売金融。
トヨタ モーター マニュファクチャリング パハ カラフォルニア㈱	Tijuana, Baja California, Mexico	千メキシコ ペソ 3,834,820	自動車	100.00 (100.00)	当社製品の販売。
トヨタ モーター マニュファクチャリング グアタマラ㈱	Aposol el Grande, Guatemala, Mexico	千メキシコ ペソ 3,395,529	自動車	100.00 (100.00)	当社製品の販売。
アルゼンチナトヨタ㈱	Buenos Aires, Argentina	千アルゼンチ ンペソ 260,000	自動車	100.00 (100.00)	当社製品の販売。なお、当社より資金援助を受けています。
ブラジルトヨタ㈱ *1	Sao Paulo, Brazil	千ブラジ ルレアル 6,700,980	自動車	100.00 (100.00)	当社製品の販売。なお、当社より資金援助を受けています。
トヨタ モーター ヨーロッパ㈱ *1	Brussels, Belgium	千ユーロ 3,594,469	自動車	100.00 (100.00)	当社製品の販売。自動車技術の研究開発および海外・広域活動の促進。なお、当社より資金援助を受けています。
トヨタ モーター マニュファクチャリング チェコ㈱	Kolin, Czech	千チェコ コシナ 5,140,000	自動車	100.00 (100.00)	当社製品の販売。
トヨタフランス㈱	Villacoublay, France	千ユーロ 2,125	自動車	100.00 (100.00)	当社製品の販売。
トヨタ モーター マニュファクチャリング フランス㈱	Ormeaux, France	千ユーロ 268,079	自動車	100.00 (100.00)	当社製品の販売。
トヨタ モーター ファイナンス (オランダ) ㈱ *2	Amsterdam, Netherlands	千ユーロ 908	金 融	100.00 (100.00)	当社関係会社への資金調達の支援。
トヨタセントラルヨーロッパ㈱	Warsaw, Poland	千ユーロ 100	自動車	100.00 (100.00)	当社製品の販売。
トヨタ モーター マニュファクチャリング ターキー㈱	Ankara, Turkey	千トルコ リラ 100,105	自動車	90.00 (90.00)	当社製品の販売。

CH constructed from Hofstede's cultural dimensions

- Power distance (PDI)
 - Extent the less powerful members of organizations and institutions accept and expect that power is distributed unequally.
- Individualism – collectivism (IND)
 - Extent to which people feel independent, as opposed to being interdependent as members of larger wholes.
- Masculinity – femininity (MAS)
 - Extent to which the use of force is endorsed socially.
- Uncertainty avoidance (UAI)
 - Society's tolerance for uncertainty and ambiguity.
- Long-term orientation (LTO)
 - The world is in flux, preparing for the future is necessary versus the world is as it was created, the past provides a moral compass.
- Indulgence – self restraint (LVR)
 - Its good to be free versus life is hard, importance of duty is normal.

Hofstede's cultural dimensions, Japan vs others



Japan's cultural dimension scores shown as a red dot.

Measuring cultural heterogeneity

- Euclidean cultural distance between country j and Japan:

$$CD_{d,j} = \sqrt{\frac{(I_{d,j} - I_{d,JPN})^2}{V_d}}$$

- Average cultural heterogeneity:

$$CH_{s,d,i,t} = \frac{\sum_{j=1}^J SUB_{i,j,t} \times CD_{d,j}}{BR_{i,t}}, \quad s = \begin{cases} H & \text{for } I_{d,j} > I_{d,JPN} \\ L & \text{for } I_{d,j} < I_{d,JPN} \end{cases}$$

- Two measures of heterogeneity for each dimension for affiliate country dimension index higher (H) or lower (L) than Japan.
 - Cultural dimensions are distinct (a composite may not make sense).
 - Some cultural gaps may be less disruptive than others.
 - Positive or negative gaps may have different effects.

Regression specifications

- Regress cash holdings on OSNS, FSHR and each cultural dimension separately (Sep.).
- Regress cash holdings on OSNS and FSHR, all cultural dimension (Sub.).
- Regress cash holdings on all variables, without and with industry effects (All).
- Here I present only the main results (All), and summarise the results of the other models.

Main results

	Dependent variable: LCASH				Dependent variable: CATA			
	(21)		(22)		(23)		(24)	
	Within	Between	Within	Between	Within	Between	Within	Between
OSNS	0.135**	0.159**	0.140**	0.319***	0.016*	0.010	0.017*	0.045***
FSHR	-0.168**	0.424***	-0.168**	0.164	-0.022**	0.062**	-0.021*	0.016
PDIL	0.071**	0.046	0.071**	0.028	0.018***	0.015	0.018***	0.012
PDIH	-0.014	-0.054	-0.013	-0.037	0.000	-0.011	0.000	-0.008
IDVL	0.077**	0.006	0.075**	0.124	0.011**	0.006	0.010**	0.026*
IDVH	-0.083***	0.080	-0.084***	0.062	-0.012***	0.009	-0.013***	0.008
MASL	0.045	-0.135**	0.046	-0.138**	0.000	-0.024**	0.000	-0.025**
MASH	-0.037	0.114	-0.038	0.101	-0.015	0.012	-0.015	0.014
UAIL	0.043*	-0.161***	0.042*	-0.190***	0.009**	-0.019**	0.009**	-0.025***
UAIH	-0.011	0.041	-0.013	0.090	-0.012	-0.037	-0.012	-0.015
LTOL	0.053**	-0.018	0.052**	0.011	0.012***	0.004	0.012***	0.005
LTOH	0.044	0.229**	0.045	0.176**	0.004	0.027*	0.004	0.019
IVRL	-0.025	0.046	-0.024	0.072	-0.009*	0.018	-0.009*	0.019
IVRH	0.062**	0.024	0.063**	0.017	-0.003	-0.002	-0.003	-0.005
Intercept		-0.394		-1.271***		0.330***		0.244***
Controls		Y		Y		Y		Y
Country		Y		Y		Y		Y
Industry		N		Y		N		Y
Firms		939		939		939		939
Obs.		7748		7748		7748		7748
AIC		3099		3074		-25806		-25747
BIC		3496		3665		-25409		-25156
Marg. R ²		0.891		0.902		0.575		0.623
Cond. R ²		0.974		0.974		0.910		0.909

Inference summary

Variable	Within								Between							
	LCASH				CATA				LCASH				CATA			
	Sep.		Sub.		All		Sep.		Sub.		All		Sep.		Sub.	
Industry			N	Y			N	Y			N	Y			N	Y
OSNS	+	+	+	+	+	+	(+)	(+)	+	+	+	+	+	+		+
FSHR		-	-	-	-	(-)	-	(-)	+		+				+	
PDIL			+	+		+	+	+	+				+			
PDIH																
IDVL			+	+	(-)		+	+	(+)							(+)
IDVH	-	-	-	-		-	-	-	+							
MASL	+										-	-			-	-
MASH	+	+														
UAIL		+	(+)	(+)			+	+	-	-	-	-	-	-	-	-
UAIH									+							
LTOL	+		+	+	(+)		+	+								
LTOH									+	+	+	+	+	+	(+)	
IVRL	-	-			-	-	(-)	(-)	+	(+)						
IVRH	+	+	+	+					+				(+)			

- Firms hold **more** cash when they make a greater proportion of their sales overseas, both within- and between-firm.
 - Consistent with the precautionary motive. Overseas sales involve more risk than domestic sales.
 - Financially constrained firms may accumulate cash at overseas affiliates to fund future offshore expansion (these locations may have better prospects for sales growth, and/or lower production costs).

- Within-firm, cash holdings are **negatively** related to the proportion of foreign stock holders.
 - Foreign (activist) investors may put pressure on firms to decrease cash holdings.
 - Firms that increase (decrease) cash holdings may be less (more) attractive to foreign investors from a governance or capital efficiency perspective.
 - Possible endogeneity?

- Within-firm, cash holdings are **positively** related to cultural heterogeneity that is due to:
 - **lower** power distance, individuality (more collectivist), uncertainty avoidance and long-term orientation, relative to Japan
 - **higher** impulsiveness (LCASH only).
- Consistent with the precautionary motive – higher corporate risks due to difficulty in controlling culturally distant subsidiaries, possible information asymmetries, communication difficulties.

- Within-firm, cash holdings are **negatively** related to cultural heterogeneity that is due to **higher** individualism – collectivism and **lower** impulsiveness – restraint.
 - Higher individualism cultures may have lower propensity to hold precautionary cash.
 - Establishing subsidiaries in more restrained cultures may moderate the need for precautionary cash, being easier to control.

- Between-firm, cash holdings are **negatively** related to cultural heterogeneity that is due to **lower** masculinity and uncertainty avoidance.
 - The between firm effect may indicate that some firms have developed the ability to manage culturally heterogeneous affiliates (possibly due to a long history of operating with culturally diverse affiliates).
- Between-firm, cash holdings are **negatively** related to cultural heterogeneity that is due to **higher** long-term orientation.
 - Consistent with little requirement for precautionary balances. However, few cultures have higher long-term orientation than Japan, so this result should possibly be disregarded.

Some limitations

- Although the sample includes only Prime section (better governed?) firms, no governance variables included in the model.
- Alternative measures of cultural heterogeneity?
- Endogeneity?
- Is REWB (considered) appropriate?
- This research addresses only one (narrow) aspect of corporate cash holdings. Many more research questions to be answered regarding the build-up in corporate cash holdings in Japan and globally over recent decades.

Thank you

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Appendix

Main results - control variables

	Dependent variable: LCASH				Dependent variable: CATA			
	(21)		(22)		(23)		(24)	
	Within	Between	Within	Between	Within	Between	Within	Between
SIZE	1.091***	0.896***	1.089***	0.905***	0.021***	-0.014***	0.021***	-0.012***
MTB	0.013***	0.089***	0.013***	0.053***	0.004***	0.019***	0.004***	0.012***
CFTA	1.375***	1.908***	1.373***	1.319**	0.266***	0.625***	0.265***	0.451***
CFV	-1.127***	1.116	-1.126***	-0.287	-0.271***	0.352***	-0.271***	0.105
NWCTA	2.043***	1.454***	2.049***	1.713***	0.401***	0.320***	0.403***	0.358***
CAPTA	-0.705***	-1.429*	-0.703***	-1.018	-0.133***	-0.569***	-0.133***	-0.537***
LEVTA	0.341***	-0.831***	0.338***	-0.564***	0.088***	-0.048*	0.089***	-0.028
RDTA	-0.171	-2.008**	-0.223	-0.505	-0.164*	-0.586***	-0.176**	-0.296**
AQTA	-0.235	-0.988*	-0.249	-0.030	-0.039	-0.054	-0.039	0.020
POTA	-0.759***	0.775	-0.765***	0.794	-0.182***	0.213	-0.182***	0.233
SEG	-0.083***	-0.043	-0.082***	-0.035	-0.017***	-0.009	-0.017***	-0.010*
FDI	-0.085	-0.730***	-0.076	-0.546**	0.004	-0.114**	0.006	-0.089**
TAX	0.799***	-2.985***	0.789***	-2.646***	0.097***	-0.294**	0.096***	-0.228
Country	Y		Y		Y		Y	
Industry	N		Y		N		Y	
Firms	939		939		939		939	
Obs.	7748		7748		7748		7748	
AIC	3099		3074		-25806		-25747	
BIC	3496		3665		-25409		-25156	
Marg. R ²	0.891		0.902		0.575		0.623	
Cond. R ²	0.974		0.974		0.910		0.909	