The background of the slide is a collage of various Japanese yen banknotes. Visible denominations include 10,000 yen (featuring a portrait of a man), 5,000 yen, and 1,000 yen. The text "日本銀行" (Bank of Japan) is visible on several notes. A green circular logo with a stylized 'A' is in the top right corner of the collage.

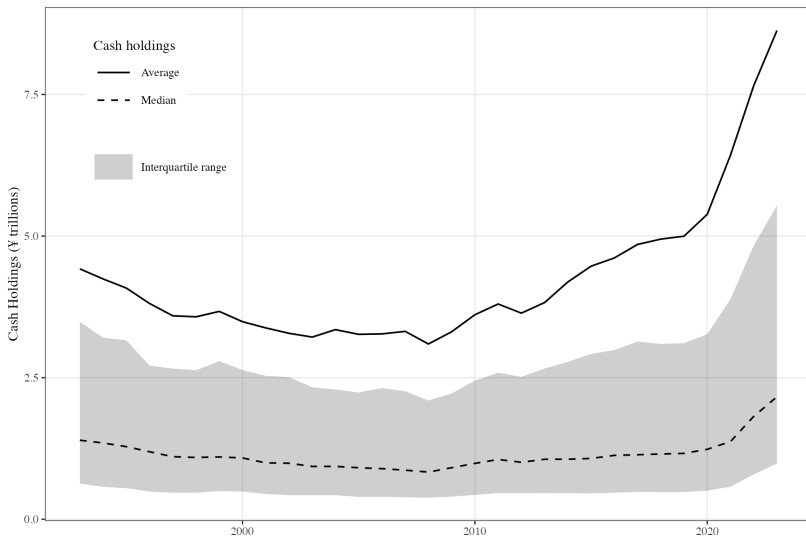
Multinationality and cash holdings: Evidence from Japan

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The Punchline

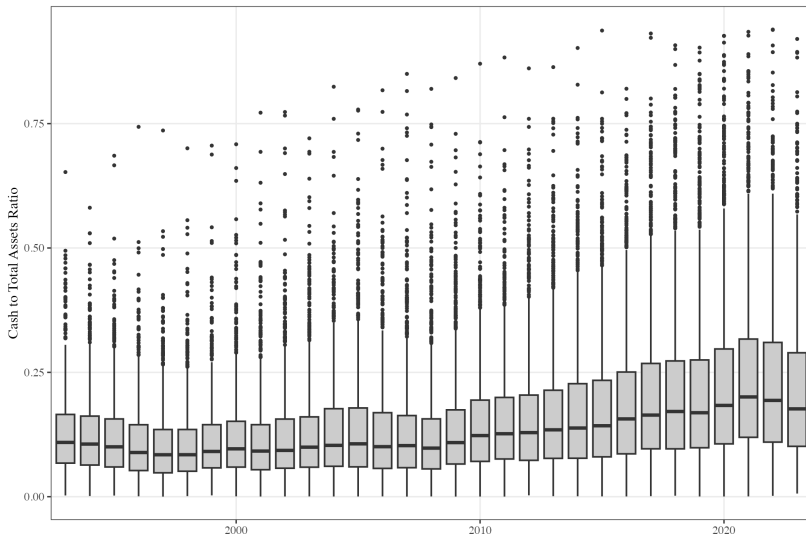
- Corporate cash holdings have been rising around the world, including in Japan.
- Firms hold cash for transactions, precautionary and agency motives.
- Does “multinationality” have an impact on precautionary cash holdings?
 - Overseas sales
 - Foreign ownership
 - Cultural heterogeneity between parent 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: power distance, uncertainty avoidance, long-term orientation.

The cash holdings of Japanese firms have risen



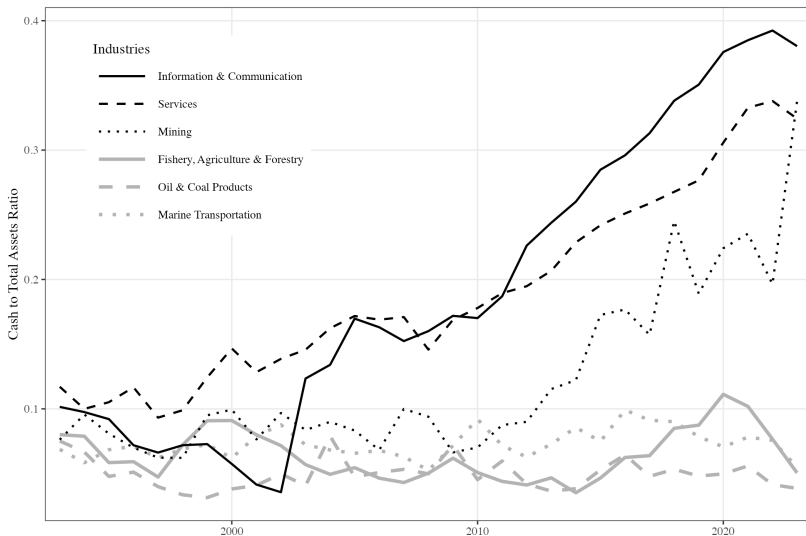
Tokyo Stock Exchange Prime (First) Section firms.

As has the cash to total assets ratio



Tokyo Stock Exchange Prime (First) Section firms.

Although there is substantial 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, both within and between firms.*
 - Cash flow, exchange rate, political and corporate risks. Financial constraints.
- *H2: Cash holdings are positively associated with the degree of foreign ownership within and between firms.*
 - 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, both within and between firms.*
 - Management challenges, information asymmetry, financial constraints, corporate risks, potential agency costs.

$$CASH_{i,t} = \alpha + \beta_1 OSNS_{i,t} + \beta_2 FSHR_{i,t} + \beta_3 CH_{d,i,t} \\ + \delta CONTROLS_{i,t} + \gamma COUNTRY_{i,t} + \phi INDUSTRY_{k,t} + \epsilon_{i,t}$$

- 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 (IMF FDI) and corporate taxation differential with Japan.
- Industry fixed effects.

Econometric approach

- Random effects within-between regression (REWB).

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

- 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, firms with missing data.
- Unbalanced panel for the period January 2014 to December 2023.
- Firm-level financial data from Nikkei NEEDS.
- Financial development from the IMF, tax rates from the Tax Foundation.
- Overseas affiliate data obtained by machine reading firms' Annual Securities Reports (有価証券報告書, Yukashouken Houkokusho or Yuho).
- Cultural dimensions indices from Geert Hofstede's website.

Machine reading the Yuho

- Accessed via the EDINET API.
- Section 1(4) provides information on affiliates.
- Record the countries where each firm has at least one subsidiary.
- Example, Toyota Motor (name, location, investment, business details, percentage of voting rights held, and other information).

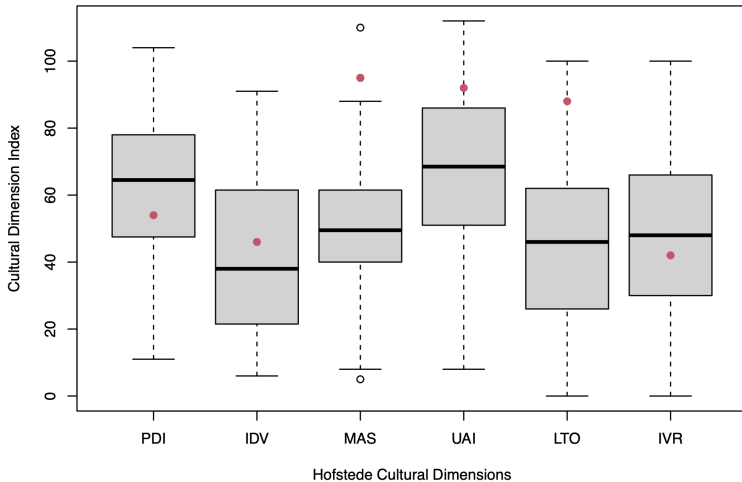
EDINET提出書類
トヨタ自動車株式会社(000424)
有価証券報告書

名称	住所	資本又は 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 マニファクチャリング テキサス㈱ *1	Sao 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㈱ *1	Henderson, Nebraska, U.S.A.	千ドル 1	金 融	100.00 (100.00)	当社製品の販売。
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 マニファクチャリング カナダ㈱ *1	Chertsey, 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 マニファクチャリング パナマ カラモニア㈱	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 6,700,580	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 3,504,469	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 マニファクチャリング チェコ㈱	Kolin, Czech	千チェコ コシナ 5,180,000	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。

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'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:

$$CH_{d,i,t} = \frac{\sum_{j=1}^J SUB_{i,j,t} \times CD_{d,j}}{BR_{i,t}}$$

- Two measures of heterogeneity for each dimension (gap to overseas affiliates positive (H) or negative (L)).
 - 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.

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	+	+	+	+					+				(+)			

Conclusion

- Firms hold **more** cash when they make a greater proportion of their sales overseas, both within- and between-firm.
- The proportion of foreign investors has a **negative** relationship with cash holdings within-firm.
- Cash holdings are:
 - **positively** related to cultural heterogeneity in PDIL, IDVL, UAIL and LTOL within-firm.
 - **positively** related to heterogeneity in IVRH (LCASH) within-firm.
 - **negatively** related to heterogeneity in IDVH and IVRL within-firm.
 - **negatively** related to heterogeneity in MASL and UAIL between-firm.
 - (**positively** related to heterogeneity in LTOH between-firm).

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