

INTERNATIONAL MONETARY FUND

Drivers of Corporate Cash Holdings in Japan

Japan

Seho Kim, Pablo Lopez Murphy, and Rui Xu

SIP/2023/029

IMF Selected Issues Papers are prepared by IMF staff as background documentation for periodic consultations with member countries. It is based on the information available at the time it was completed in March 2023. This paper is also published separately as IMF Country Report No 23/128.

2023
MAY



SELECTED ISSUE PAPER

IMF Selected Issues Paper
Asia and Pacific Department

Drivers of Corporate Cash Holdings in Japan
Prepared by Seho Kim, Pablo Lopez Murphy, and Rui Xu*

Authorized for distribution by Ranil Salgado
May 2023

IMF Selected Issues Papers are prepared by IMF staff as background documentation for periodic consultations with member countries. It is based on the information available at the time it was completed in March 2023. This paper is also published separately as IMF Country Report No 23/128.

ABSTRACT: In Japan, corporate savings have risen since 2000 in line with profits. A large share of the additional savings was kept as cash holdings (i.e., cash and short-term investments) rather than used for investment. Building on a rich literature, this paper identifies two additional drivers of corporate cash holdings using financial data of public and private Japanese firms. First, a higher share of intangible capital is associated with more cash holdings. This indicates the presence of financial frictions as intangible capital is not easily collateralizable. Such financial friction could be alleviated by shifting towards cash flow-based lending that is prevalent in the United States (US). Second, corporate tax cuts are associated with more cash holdings while having no significant effect on investment. Given the significant fiscal cost, the efficiency of corporate tax cuts should be re-evaluated.

RECOMMENDED CITATION: Kim, Seho, Pablo Lopez Murphy and Rui Xu. 2023. "Drivers of Corporate Cash Holdings in Japan." IMF Selected Issues Paper (SIP/2023/029). Washington, D.C.: International Monetary Fund.

JEL Classification Numbers:	E21, E22, G34, G25, H2
Keywords:	Corporate cash holdings, Investment, intangible assets, financial frictions, tax cuts, Japan.
Author's E-Mail Address:	Shkim33@umd.edu , PLopezMurphy@imf.org , rxu@imf.org

SELECTED ISSUES PAPERS

Drivers of Corporate Cash Holdings in Japan

Japan

Prepared by Seho Kim, Pablo Lopez Murphy, and Rui Xu ¹

¹ The authors would like to thank the Japanese authorities for providing helpful comments. We would also like to thank, without implicating, Ranil Salgado, Gee Hee Hong, Katsiaryna Svirydzenka, TengTeng Xu, Haruki Seitani, and seminar participants at the Asia and Pacific Department at the IMF for many helpful suggestions.



JAPAN

SELECTED ISSUES

March 2023

Approved By
**Asia and Pacific
Department**

Prepared By Seho Kim, Pablo Lopez Murphy, and Rui Xu

CONTENTS

DRIVERS OF CORPORATE CASH HOLDINGS IN JAPAN	2
A. Introduction	2
B. Data and Methodology	3
C. Empirical Results	6
D. Policy Implications	7
FIGURES	
1. Corporate Savings and Cash Holdings in Japan	4
2. Stylized Facts	5
TABLES	
1. Determinants of Corporate Cash Holdings in Publicly Listed Firms	8
2. Determinants of Corporate Cash Holdings in Private Firms	9
References	10

DRIVERS OF CORPORATE CASH HOLDINGS IN JAPAN¹

A. Introduction

1. In Japan, private savings have shifted from households to the corporate sector.

Household net savings, defined as gross savings minus investment, had declined before the pandemic. At the same time, Japanese corporations went from net borrowers to net savers after the asset bubble burst in the 1990s. The rise of corporate savings mainly reflects higher corporate profits while investment has stagnated.

2. Instead of scaling up investment, firms have been using their savings to deleverage and, since 2004, accumulate cash and other liquid assets. The corporate leverage ratio declined from the peak of 45 percent of total assets to about 30 percent. After the leverage ratio started to stabilize around 2004, firms began to accumulate cash and other liquid assets.

3. The literature has highlighted a few drivers of cash holdings in Japan. In general, cash holdings reflect precautionary motives given funding uncertainty faced by firms, especially during downturns (see Bates et al., 2009; Sher, 2014; and Dao and Maggi, 2018). In addition, Japanese firms have increased foreign direct investment (FDI) to diversify their production. Since it is hard to collateralize foreign assets, firms need to accumulate liquid assets to finance their FDI, as indicated by Kang and Piao (2015). Cross-country analysis in Aoyagi and Ganelli (2017) also suggests that weaker corporate governance in Japan, as measured by available indices in 2000-2013, might have contributed to higher cash holdings because managers typically prefer to hold more cash than the level optimal for shareholders.

4. This paper proposes two new drivers of corporate cash holdings and tests them using firm-level data in Japan.

- *The first driver is the rising share of intangible capital.* This is motivated by the rich literature on corporate cash holdings in the US (Opler et al, 1999; Bates et al., 2009; Falato et al. 2020). In particular, Falato et al. (2020) showed that intangible capital can explain 75 percent of increasing corporate cash holdings in the US. This is because intangible capital cannot be easily verified or liquidated, and as such, cannot be pledged as collateral to raise debt financing. Under frictional capital markets, where external funds command substantial premiums, the rising importance of intangible capital boosts firms' precautionary demand for cash to ensure sufficient liquidity for future investment opportunities. In Japan, the share of intangible assets (as a percent of total capital) increased by more than 5 percentage points since 2004, as shown in Figure 1.
- *The second contributing factor is declining corporate tax rates.* In Japan, the statutory corporate tax rate (i.e. central and local taxes combined) declined from 40 percent in 2004 to around 30 percent in 2016. Theoretically, lower corporate tax rates would increase the return on liquid

¹ Prepared by Seho Kim (University of Maryland), Pablo Lopez-Murphy, and Rui Xu (both APD).

assets and thus encourage more cash holdings (Riddick and Whited 2009). Kawamoto and Muraki (2020) found that reductions in statutory corporate income tax rates can explain one-third of the rise in corporate net financial assets in 2003-17 across 12 economies.

5. Empirical results confirm that more intangible capital and lower corporate tax rates contribute to corporate cash holdings, with the tax cuts more relevant for public firms.

In terms of magnitude, the rising intangible capital in Japan can explain about a quarter of the increase of cash holdings among public firms, and about 30 percent of the increase of cash holdings among private firms. The decreasing corporate tax rates can explain about 4 percent of the increase in cash holdings among public firms. The effect of tax cuts is much weaker among private firms due to various subsidies and exemptions for SMEs.

B. Data and Methodology

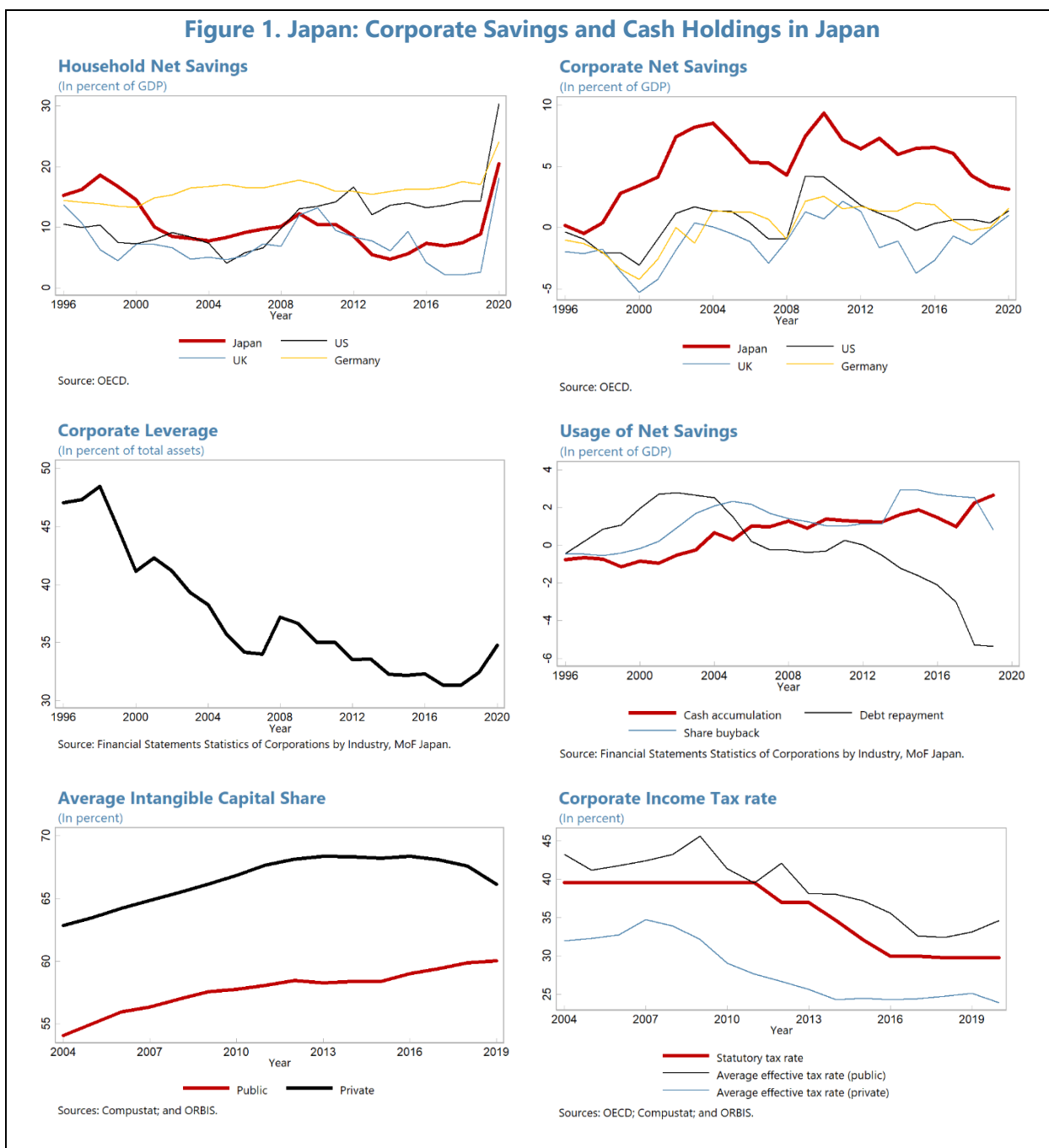
6. Two data sources are used to cover both publicly listed firms and private firms. For public firms, we use Compustat-Global which covers the universe of publicly listed firms in Japan. For private firms, we use Orbis database.² Although Orbis also includes some public firms, the coverage is incomplete, and the sample fluctuates over time. Given the difference in the two data sources, a separate analysis is done for public firms vs. private firms.

7. Our sample covers around 70 percent of the firms surveyed for the Financial Statements Statistics of Corporations by Industry (FSSCI). The coverage is increasing over time mainly due to the evolving sample of private firms in Orbis. Orbis started to have significant coverage of Japanese firms in 2003 and the coverage has increased over time.

8. Following the literature, cash holdings are defined as the sum of cash deposits and other liquid assets (as a share of total assets) Liquid assets include government and other marketable securities listed as short-term. They are treated as cash as they can be converted into cash immediately. Cash and liquid assets are captured in a variable named Cash and Short-term Investments (CHE) in Compustat-Global for publicly listed firms. In Orbis, cash holdings are captured in a variable called Cash and Cash Equivalent. For the regression analysis, we follow the literature and winsorize dependent and independent variables at level 1 percent and 99 percent.

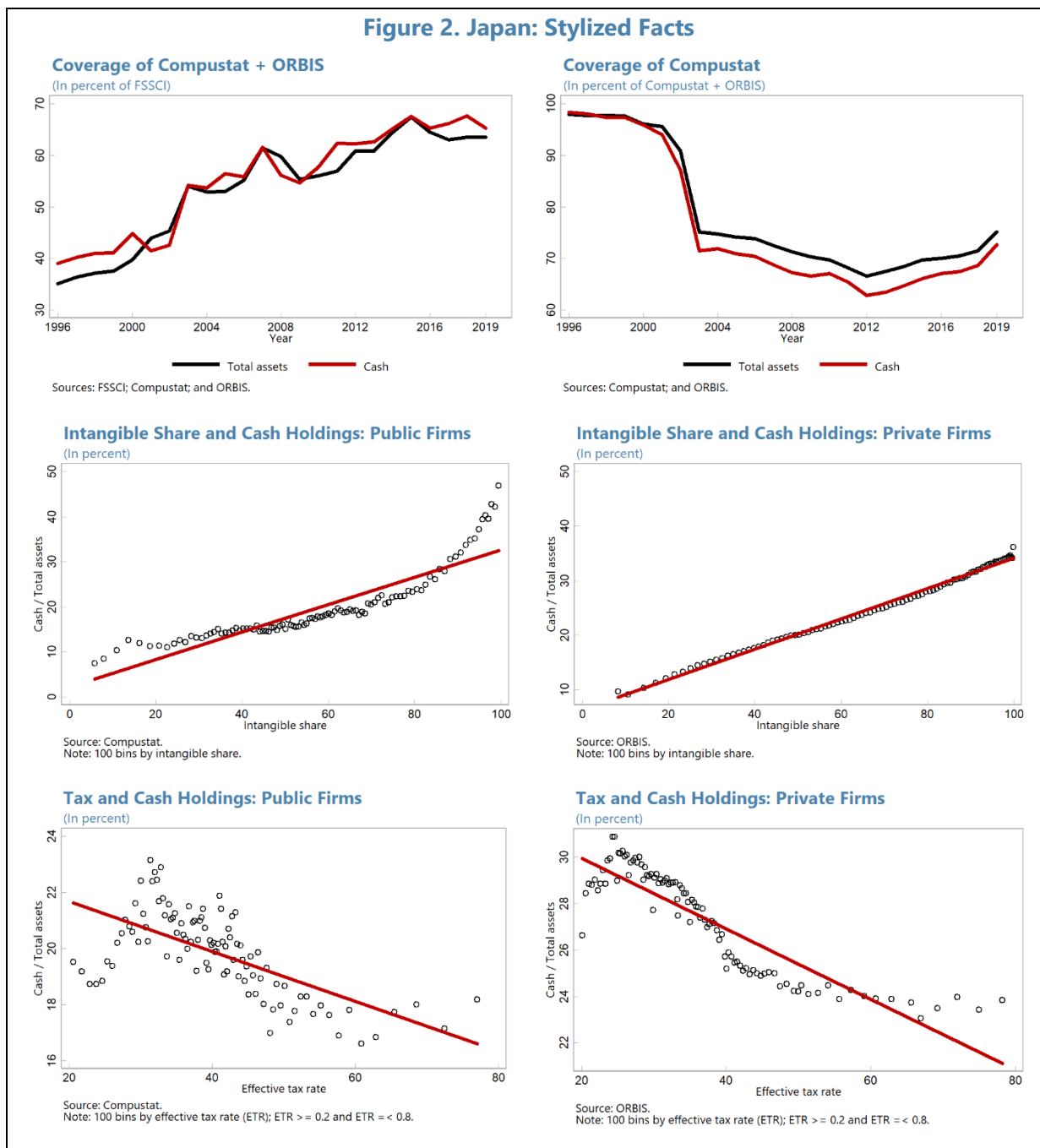
² The cleaned Orbis database comes from Diez et al. 2021.

Figure 1. Japan: Corporate Savings and Cash Holdings in Japan



9. Among Japanese firms, cash holdings are positively associated with intangible share. This is true for both private and public firms, as shown in Figure 2. Intangible capital is estimated by accumulating the intangible investment using the perpetual inventory method. Following the literature, intangible investment is defined as the sum of R&D investment and 30 percent of selling and administrative expenses. In some cases, intangible assets enter the balance sheet, such as when a company acquires an external patent or does M&A. As a robustness check, we add the “book” intangible assets to our baseline intangible capital.

Figure 2. Japan: Stylized Facts



10. On the other hand, cash holdings are negatively associated with corporate tax rates. This implies that firms tend to save the tax deduction instead of investing them. For corporate tax rate, we calculate the effective tax rate (ETR) using tax payments and pre-tax income. Compared to the statutory tax rates, the effective tax rates can capture the idiosyncratic effects of various tax credits, transfer pricing, and tax loss carryover. From a cash flow point of view, the effective tax rates matter more than the statutory tax rates. Fiscal policies can affect effective tax rates through tax credits, such as the one introduced in 2013 to incentivize wage increases.

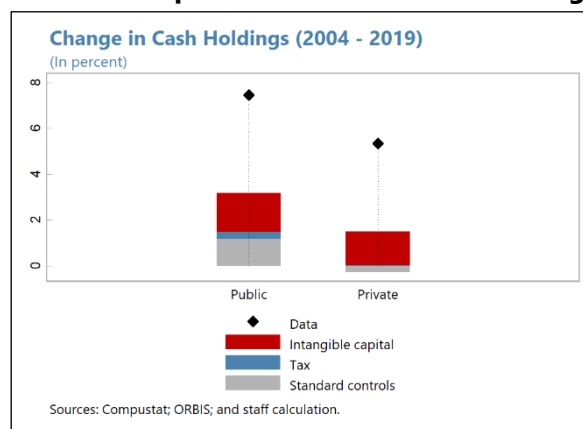
11. Fixed-effect panel regression models are estimated using either the public firm sample or the private firm sample. Standard controls are included, namely cash flow volatility, market-to-book ratio, total assets, cash flow (as a share of total assets), capital expenditures (as a share of total assets), a dummy for paying dividend, net working capital (as a share of total assets), and leverage.³ The two variables of interest, namely intangible share and tax rates, are lagged by one year to mitigate potential reverse causality issue. Firm fixed effects are included in all specifications. Year fixed effects are not included for tax rate analysis as most variations in tax rates come from the time dimension. Instead, a recession dummy is included.

C. Empirical Results

12. Firms increase cash holdings when intangible capital shares go up. This holds for both public (Table 1) and private firms (Table 2), suggesting the presence of financing constraints. In terms of magnitude, a 1 percentage point increase in intangible share is associated with about 0.24 percentage point increase in cash over asset ratio among public firms, and 0.27 percentage point increase in cash ratios among private firms. The effect is larger among private firms because they likely have less collateral and face more financing constraints.

13. Firms also increase cash holdings when effective tax rates go down. It means that firms tend to save the tax reduction. An auxiliary regression on firm investment suggests that tax cuts do not boost investment. The effect of tax rates on cash holdings is stronger among public firms (Table 1) than among private ones (Table 2). This likely reflects the fact that public firms pay more taxes. The tax rates among private firms are also very noisy, suggesting attenuation bias. Once we exclude observations with tax rates below 20 percent or above 80 percent, the coefficient increases by seven-fold.

14. The two factors combined can explain more than a quarter of the new cash holdings since 2004. Among public firms, the average cash holdings increased by about 7.5 percentage points, of which 1.7 percentage points can be explained by the rising intangible share and 0.3 percentage points by lower tax rates. Among private firms, the average cash holdings increased by about 5.4 percentage points, of which 1.5 percentage points can be explained by intangible share.



15. The results are robust to using alternative measures of intangible shares and tax rates.

When we add the book value of intangible assets to our baseline intangible capital, the coefficient is slightly lower but remains significant. The effect of statutory tax rates is statistically

³ Market-to-book ratio and a dummy for paying dividend are excluded in a regression with private firms as private firms do not have market values and Orbis does not have information on dividend.

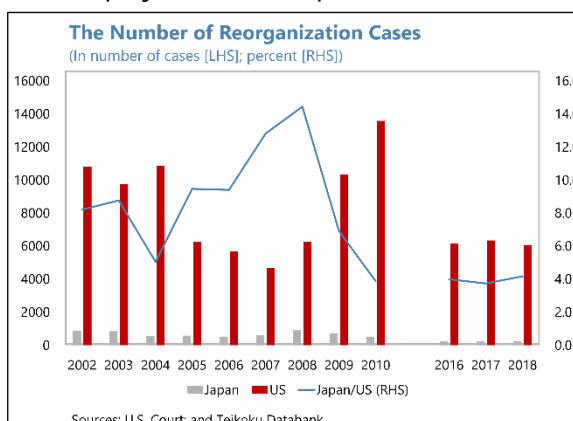
significant and larger for both public and private firms, suggesting some attenuation bias in the effective tax rates.

D. Policy Implications

16. Easing financing barriers can reduce precautionary cash holdings, especially in sectors that rely more on intangible capital. As suggested by OECD (2021), the following set of policy measures could help.

- *Standard innovation policies that would benefit investment in intangibles.* The development of venture capital markets, which are important source of finance for start-ups and intangible intensive firms, and government support of high growth SMEs could ease the financing frictions faces by young innovative firms. For larger firms, the expansion of well-designed R&D tax incentives could incentivize more innovative investment.

- *Financial market policies that favor intangible-intensive projects.* While Japanese banks still require physical capital and prefer real estate as collateral, cash flow-based lending (CBL) that relies on firms' operating profits is common for banks in the US (Lian and Ma 2021). Under CBL, creditors can still recover their investment through the reorganization process even if the borrower defaults. The CBL regime could relieve the collateral constraint as it favors innovative firms with intangible-intensive projects. However, adopting CBL is still challenging in Japan due to the rarity of corporate reorganization. Improving labor flexibility and improving the venture capital and private equity market could pave the way to CBL.



- *Use of intellectual property-backed loans.* Assets protected by intellectual property rights (IPR) – such as patents, trademarks, copyrights, and design rights – can serve as collateral when searching for bank financing. The Japan Patent Office (JPO) already provides IP Business Valuation reports to banks by request. However, prudential regulation may create barrier to the development of loans secured against intangibles, as IP-backed loans are perceived as riskier and do not contribute to the banks' regulatory capital. To remove such barriers, revising Basel III regulations to account for the new financing needs of corporations, while ensuring financial stability, is needed. But the process will likely be complex and lengthy, requiring international cooperation. An alternative to allow banks to transfer part of the risk from their balance sheets to those of insurance companies is currently being investigated by the British Business Bank (British Business Bank, 2018).

17. Corporate tax cuts have not been effective in boosting investment. Lower tax rates helped corporations improve profits, but most of the reduced tax bills were saved in cash or other

liquid assets. Firms did not increase investment or raise wages. Given the significant fiscal cost and the already high public debt, more caution is needed for broad-based corporate tax cuts in the future.

Table 1. Japan: Determinants of Corporate Cash Holdings in Publicly Listed Firms

VARIABLES	Cash / Total assets				
	(1)	(2)	(3)	(4)	(5)
(Lagged) intangible share	0.232***	0.199***		0.238***	0.248***
	(0.018)	(0.013)		(0.019)	(0.020)
(Lagged) effective tax rate			-0.025***	-0.021***	-0.039***
			(0.003)	(0.003)	(0.004)
Cash flow volatility	0.821***	0.041	0.964***	0.736***	0.673***
	(0.267)	(0.201)	(0.275)	(0.249)	(0.242)
Market to book ratio	0.002	-0.001	-0.001	-0.001	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
log(Total assets)	0.017***	0.000	0.010**	0.021***	0.023***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Cash flow / Total assets	0.206***	0.163***	0.219***	0.223***	0.233***
	(0.015)	(0.013)	(0.013)	(0.013)	(0.012)
Capex / Total assets	-0.337***	-0.303***	-0.356***	-0.351***	-0.377***
	(0.031)	(0.027)	(0.030)	(0.028)	(0.027)
Positive dividend (dummy)	-0.000	0.002	-0.006	-0.003	-0.011*
	(0.003)	(0.002)	(0.005)	(0.005)	(0.006)
Net working capital / Total assets	-0.220***	-0.247***	-0.248***	-0.259***	-0.265***
	(0.020)	(0.019)	(0.024)	(0.022)	(0.020)
Debt / Total assets	-0.212***	-0.207***	-0.247***	-0.219***	-0.213***
	(0.021)	(0.020)	(0.020)	(0.021)	(0.021)
Recession dummy			-0.014***	-0.012***	-0.011***
			(0.001)	(0.001)	(0.001)
Constant	-0.114*	0.123**	0.117**	-0.136*	-0.146**
	(0.066)	(0.062)	(0.053)	(0.070)	(0.072)
Adj. R-squared	0.835	0.843	0.848	0.855	0.861
Firm FE	Yes	Yes	Yes	Yes	Yes
Year FE	No	Yes	No	No	No
Remove tax rate outliers (<20% or >80%)	No	No	No	No	Yes
N	42982	42982	34920	34920	31226

Note: standard errors are clustered at industry level; *** p<0.01, ** p<0.05, * p<0.1

Sources: Compustat Global and author's calculation.

Table 2. Japan: Determinants of Corporate Cash Holdings in Private Firms

VARIABLES	Cash / Total assets				
	(1)	(2)	(3)	(4)	(5)
(Lagged) intangible share	0.256***	0.248***		0.269***	0.266***
	(0.008)	(0.008)		(0.009)	(0.011)
(Lagged) effective tax rate			-0.002***	-0.002**	-0.015***
			(0.001)	(0.001)	(0.001)
Cash flow volatility	0.119*	-0.022	0.184**	0.170**	0.241**
	(0.064)	(0.020)	(0.090)	(0.082)	(0.120)
log(Total assets)	0.020***	0.017***	-0.009*	0.012*	0.003
	(0.005)	(0.004)	(0.005)	(0.006)	(0.008)
Cash flow / Total assets	0.128***	0.126***	0.147***	0.159***	0.189***
	(0.007)	(0.006)	(0.011)	(0.011)	(0.021)
Capex / Total assets	-0.273***	-0.267***	-0.190***	-0.301***	-0.327***
	(0.009)	(0.010)	(0.008)	(0.011)	(0.013)
Net working capital / Total assets	-0.255***	-0.257***	-0.310***	-0.322***	-0.384***
	(0.015)	(0.015)	(0.017)	(0.017)	(0.020)
Debt / Total assets	-0.061***	-0.064***	-0.071***	-0.051***	-0.025***
	(0.007)	(0.007)	(0.008)	(0.008)	(0.008)
Recession dummy			-0.002**	-0.001	-0.000
			(0.001)	(0.001)	(0.001)
Constant	-0.299***	-0.229***	0.432***	-0.150	0.029
	(0.093)	(0.085)	(0.110)	(0.123)	(0.161)
Adj. R-squared	0.828	0.831	0.839	0.847	0.866
Firm FE	Yes	Yes	Yes	Yes	Yes
Year FE	No	Yes	No	No	No
Remove tax rate outliers (<20% or >80%)	No	No	No	No	Yes
N	497954	497954	342688	342687	207678

Note: standard errors are clustered at industry level; *** p<0.01, ** p<0.05, * p<0.1

Sources: Orbis Database and author's calculation.

References

- Aoyagi, Chie and G. Ganelli. 2017. "Unstash the Cash! Corporate Governance Reform in Japan." *Journal of Banking and Financial Economics*, 1(7) 51-69.
- Bates, T. W., K. M. Kahle, and R. M. Stulz. 2009. "Why Do U.S. Firms Hold so Much More Cash than They Used To?" *Journal of Finance* 64 (5): 1985–2021.
- British Business Bank, 2018. "Using IP to Access Growth Funding." Intellectual Property Office Report.
- Dao, M. C., and C. Maggi. 2018. "The Rise in Corporate Saving and Cash Holding in Advanced Economies : Aggregate and Firm Level Trends." *IMF Working Papers* 18/262.
- Diez, F. J., J. Fan and C. Villegas-Sanchez, 2021. "Global declining competition?" *Journal of International Economics* 132: 103492.
- Falato, A., D. Kadyrzhanova, J. Sim and R. Steri. 2020. "Rising Intangible Capital, Shrinking Debt Capacity, and the US Corporate Savings Glut." *Journal of Finance, Forthcoming*.
- Kang, J. S. and S. Piao. 2015. "Production Offshoring and Investment by Japanese Firms." *IMF Working Papers* 15/183.
- Kawamoto, A. and K. Muraki. 2020. "Tax Competition: Is it a Source of the Corporate Savings Glut?." *World Bank Policy Research Working Paper* 9302.
- Lian, C., & Ma, Y. (2021). Anatomy of corporate borrowing constraints. *The Quarterly Journal of Economics*, 136(1), 229-291.
- OECD, 2021. "Bridging the gap in the financing of intangibles to support productivity: Background paper." An OECD contribution to the G20 Italian Presidency 2021.
- Opler, T., Pinkowitz, L., Stulz, R., & Williamson, R. (1999). The determinants and implications of corporate cash holdings. *Journal of Financial Economics*, 52(1), 3-46.
- Riddick, L. A., and T. M. Whited. 2009. "The Corporate Propensity to Save." *Journal of Finance* 64 (4): 1729–66.
- Sher, G. 2014. "Cashing in for Growth: Corporate Cash Holdings as an Opportunity for Investment in Japan." *IMF Working Papers* 14/221.