Lending Behavior of Japanese Megabanks in the Project Finance Market of the United States

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ABSTRACT

This study investigates the lending behavior of Japanese megabanks in the project finance market of the United States. Megabanks have been expanding their overseas businesses since the mid-2000s. Among a wide variety of overseas activities, project finance attracts our academic interest because megabanks dominated the top three of the 2015 Arranger rankings. This study examines the characteristic of megabanks by employing two statistical methods: a comparative analysis and a probit model. Our dataset covers transactions from 2013 to 2015 and comprises 439 tranches. The estimation results present three major characteristics of megabanks. First, megabanks tend to finance relatively large projects with long maturity periods. Second, most transactions in which megabanks participated are in US dollars. Third, statistical examinations revealed that the probability that megabanks provided loans for thermal-power projects is relatively high. These characteristics imply that megabanks are aggressive in taking risks but control excess risk by participating in power generation projects that have an established scheme for risk control.

Keywords: Project finance, Japanese bank, Probit model

1. INTRODUCTION

The presence of Japanese megabanks is increasing presence in the United States. They occupied the top three positions in the US project finance market in 2015. Competition in the US is an important factor in the growth strategies of megabanks. The US market represented the largest share of project financing that megabanks participated in 2014, there are 370 transactions in the US, 123 in the UK and 80 in Canada. Overseas activities, including project finance, are pillars of business strategy for megabanks. The Bank of Tokyo-Mitsubishi UFJ (BTMU) increased its overseas lending by 24.2%, while Sumitomo Mitsui Banking Corporation (SMBC) and Mizuho Bank (Mizuho) did so by 24.8% and 23.8%, respectively, as of March 2015. Moreover, the ratio of overseas

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profits to overall profits for BTMU, SMBC, and Mizuho account for 40.9%, 28.7%, and 24.6%, respectively. Japanese megabanks have increased the share of overseas business in their allover operations. The results of study are of significance for the business strategies of Japanese megabanks.

We aim to examine the lending behavior of megabanks in the US project finance market to identify the source of competitiveness. Two analyses provide some answers. The first is a comparative analysis between megabanks and other banks. Prior studies used comparative frameworks to investigate differences in lending behavior between bank types. Harjoto, Mullineaux, and Yi (2006) compared commercial banks and investment banks by using data of 6,080 syndicated loans in the US from 1996 to 2003. Haselmann and Wachtel (2011) detected differences between foreign banks and local banks, focusing on 25 European countries. Pessarossi, Godlewski, and Weil (2010) also compared the lending behavior of foreign banks and local banks in China. Our study is similar in that it employs comparative frameworks based on bank types; however, it differs from previous studies by focusing on Japanese megabanks.

The second analysis is a probit model used for investigating syndicated-loan markets. Earlier studies used a binary-choice models, such as the probit model, to detect lending behaviors on whether or not respective banks participated in a loan transaction. Hence, such studies employ a dichotomous variable (as an explained variable) to demonstrate loans characteristics that interested banks participate in. For example, Haselmann and Wachtel (2011) employed this type of study when they investigated the lending behavior of European banks. Yamaguchi (2015) studied how Japanese regional banks behave in cross-border syndicated loan markets. Although we investigate bank behavior in the project finance market, our study uses the same statistical method as previous studies because project finance requires loan syndication.

The rest of this paper is organized as follows. The following section identifies changes in the ranking of megabanks in the US project finance market by using league tables. Further, we investigate characteristics of transactions from the perspective of loan terms and others. Section 3 conducts a probit analysis, controlling possible variables and highlighting factors that affect the participation of Japanese banks. The last section summarizes the major findings about the lending behavior of megabanks and presents a future research strategy.

2. COMPARATIVE ANALYSIS

Recently, Japanese megabanks have had an increasing presence in the United States

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project finance market. Table 1 is a league table that shows megabanks' remarkable increase in ranking as an arranger bank in. It compares rankings from 2010 to 2012 and from 2013 to 2015. Only BTMU was within the top ten lenders in the first period, when the US economy was in the doldrums due to the subprime crisis. Strong monetary easing was still required for economic stimulus, and quantitative easing (QE2 and QE3) were consecutively conducted. In the second period, Japanese megabanks moved ahead European banks in the project finance market, occupying top three rankings. There was a sign of economic upturn in this period and rise in employment and income brought pushed private consumption, resulting in a virtuous cycle. The Federal Reserve Board began tapering in January 2014 and decreased its scale of easing in a phased manner, finally ending QE3 in October 2014. In the project finance market, loan sizes expanded in this positive economic and financial environment.

Table 1. League table

2010-2012				2013-2015			
Rank	Lender	Volume (mil. USD)	Total Deals	Rank	Lender	Volume (mil. USD)	Total Deals
1	Union Bank	24,170	54	1	Bank of Tokyo-Mitsubishi UFJ	48,785	35
2	Societe Generale	19,016	19	2	Sumitomo Mitsui Banking Corp	47,548	37
3	Royal Bank of Canada	17,077	19	3	Mizuho Bank	46,531	39
4	Bank of Tokyo-Mitsubishi UFJ	15,904	20	4	Societe Generale	40,872	30
5	Lloyds Bank	15,675	16	5	HSBC	39,183	15
6	Bank of Nova Scotia	15,112	12	6	Credit Agricole CIB	36,951	32
7	Credit Suisse	13,676	9	7	Credit Suisse	34,395	15
8	ING Bank	12,300	24	8	Royal Bank of Canada	32,429	16
9	Siemens Financial Services	11,905	20	9	Goldman Sachs & Co	28,533	10
10	Sovereign Bank	11,592	12	10	Deutsche Bank	25,702	24

Source: Thomson Reuters, *DealScan*

Notes: Shaded areas denote Japanese banks, volume indicates the accumulated amount of all deals that each bank arranged.

Next, we compare project finance transactions of two groups from three perspectives in order to highlight characteristics of the lending behavior of megabanks. The first group, Participation, comprises transactions in which megabanks participated, and the second group, Non-Participation, comprises transactions in which megabanks did not participate. Our research covers the period from 2013 to 2015, when megabanks increased their presence in the US market. We obtained data from the Thomson Reuter *DealScan* database, the world's largest database specializing in loan transactions. *DealScan* contains information on more than 150,000 loan transactions covering Asia, North America, South America, and Europe.

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The first point of comparison is project types between the two groups. Table 2 presents the ranking of project type for the two groups. For both groups, project types for the first four rankings were the same: solar power, wind power, thermal power, and LNG facilities. Notably, power projects occupy the top three for both groups, as power generation projects scheme were already established and banks could more easily screen risks for such projects than for other types. We find the most remarkable difference in the share of solar power: Japanese banks' participation was about 10 percentage points lower than Japanese banks' non-participation. However, the project patterns are almost the same between the two groups.

Table 2. Comparison of project type

Participation				Non-Participation			
Rank	Type	Number	Share (%)	Rank	Type	Number	Share (%)
1	Solar power	41	28.1	1	Solar power	115	39.2
2	Thermal power	40	27.4	2	Wind power	68	23.2
3	Wind power	23	15.8	3	Thermal power	43	14.7
4	LNG facilities	16	11.0	4	LNG facilities	11	3.8
5	Pipeline	8	5.5	5	Oil development	10	3.4
6	Road	4	2.7	6	Cogeneration	7	2.4
7	Parking	4	2.7	7	Water power	6	2.0
8	Power transmisson	3	2.1	8	Port	6	2.0
9	Oil development	2	1.4	9	Power transmisson	5	1.7
10	Other	5	3.4	10	Other	22	7.5
	Total	146	100		Total	293	100

Source: Author's calculation based on Thomson Reuters, *DealScan*

The second point of comparisons is continuous variables related to loan terms. Table 3 presents comparison results between the two groups. First, we cannot find a difference in loan amount as demonstrated by an insignificant result via the Mann-Whitney test. Second, the comparison results of loan maturity demonstrate that megabanks participated in project finance with relatively longer maturity periods compared to that of Non-Participation, despite common project types between the two groups. Third, we find a difference in syndicate size measured by the number of participant banks in a syndicate. The Participation group has a relatively large syndicate size, and this finding is supported by a statistical test. On the surface, the larger syndicate size of Participation contradicts the fact that we could not find a difference in loan amount between the two groups. In fact, a distribution shape of loan amount can explain this contradiction. The

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75% point of Participation and Non-Participation are 320 million USD and 191 million USD, respectively. The maximum of Participation and Non-Participation are 8,400 million USD and 4,000 million USD, respectively. These figures demonstrate that megabanks participated in larger-sized loans, and this fact is consistent with the larger syndication size of the Participation group.

Table 3. Comparisons: Continuous variables

Variables	Participation		Non-Participation		U-test
	Median	Sample	Median	Sample	
Amount(USD millions)	74.3	146	73.3	293	0.22
Maturity (years)	7.4	146	5	293	0.00
Number	5	146	3	293	0.00

Source: Author's calculation based on Thomson Reuters, *DealScan*

The third point of comparisons is discrete variables that capture loan characteristics. Table 4 presents comparison results about variables for five categories. The first category is currency denomination, with Foreign designating loans denominated in foreign currency. The comparison result demonstrates a lower share for the Participation group. This result is statistically significant and indicates that megabanks finance more projects in US dollars than other group. This financing pattern of projects is rational from the viewpoint of asset and liability management. For example, power generation projects, which account for the greater part of projects generate revenues in US dollars. This revenue corresponds to repayment source; therefore, financing should be in the same currency.

For the second category, we could not find a difference in distribution method, which comprises Club and Bilateral. Their shares indicate the loan distribution capability of megabanks that account for the top three positions as an arranger bank. We can interpret from the findings that megabanks are not inferior to European banks in invitation skill of participant banks and distribution network.

In the third category, facility type, we observe differences in two variables. Bridge stands for bridge loans that help close the gap between short-term cash requirements and long-term loans and are typically extended for 12 months. The extension of a bridge loan has the benefit of providing the borrower an opportunity to take a chance to receive a mandate for the permanent financing of a project. However, megabanks present a lower share of Bridge. In contrast, we confirm a remarkable difference in the share of loans extended by the form of standby credit. As for Standby, the share of Participation

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is almost twice as that of Non-Participation.

With regard to project type, the major objectives of projects create clear-cut differences in shares between the two groups. Above all things, megabanks tend to participate in loans for thermal-power projects.

Table 4. Comparisons: Discrete variables

Category	Variable	Participation		Non-Participation		χ^2 test
		Number	Share (%)	Number	Share (%)	
Currency	Foreign	2	1.4	16	5.5	0.04
Distribution method	Club	25	17.1	34	11.6	0.11
	Bilateral	20	13.7	55	18.8	0.18
Facility type	Bridge	5	3.4	23	7.8	0.07
	Standby	61	41.8	65	22.2	0.00
	Revolve	11	7.5	24	8.2	0.81
Tranche	Below	81	55.5	140	47.8	0.12
Project type	Solar power	41	28.1	115	39.2	0.02
	Wind power	23	15.8	68	23.2	0.06
	Thermal power	40	27.4	43	14.7	0.00
	LNG facilities	16	11.0	11	3.8	0.00

Source: Author's calculation based on Thomson Reuters, *DealScan*

3. PROBIT ANALYSIS

3.1 Methodology

We examine the lending behavior of megabanks in controlling several variables at the same time. This method can present important factors to highlight characteristics of megabanks in the US-project finance market. Our probit model is formulated as follows. The explained variable is a dummy variable that takes unity if megabanks participated in a transaction. The explanatory variables comprise four categories: loan terms, distribution methods, facility types, and project types. The first category, loan terms, includes three variables. *LAMOUNT* is the log value of the loan amount in millions of US dollar. The comparison results of Table 3 demonstrate a statistically insignificant difference between two groups. However, we confirmed a remarkable difference between maximum and 75% point of loan amount, and we expected that megabanks tend to participate in larger-sized project finance. Hence, the expected sign of *LAMOUNT* should have been positive. Next, *MATURITY* is the loan period represented

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in years. We expected that the sign of *MATURITY* is positive because the comparative analysis demonstrates that megabanks participated in project finance with longer maturity. The third loan term is *FOREIGN*, a dummy variable that takes the value of 1 if the loan is denominated in a foreign currency. Forecasting the sign of the coefficient is difficult, and we expected that this variable does not affect the participation probability of megabanks, as Table 4 presents a small difference in the share of foreign currency denomination.

The second category, distribution methods, comprises two variables. *CLUB* is a dummy variable that takes the value of 1 if a loan is distributed in a club deal. *BILATE* is a dummy variable that takes the value of 1 if a loan is extended in a bilateral base. We did not observe statistically significant differences in these two variables. Hence, we expect that these variables do not affect the lending behavior of megabanks.

The third category, facility types, which includes *BRIDGE* and *STANDBY*, is a dummy variable that takes the value of one if a loan is a bridge loan or standby credit. Table 4 shows a remarkably higher share of standby credit in facility types. The difference between the two groups is statistically significant. These results indicate that *STANDBY* enhances the participation probability of megabanks.

The last category is project types which comprises the following three variables.

SOLAR: Dummy variable taking the value of 1 if the project type is solar power generation;

WIND: Dummy variable indicating whether the purpose of a loan is the construction of a wind power plant; if so, this variable takes the value of 1; and

THERMAL: Dummy variable taking the value of 1 if project type is thermal power generation.

These top three project types involve transactions in which megabanks participate. *SOLAR* was expected to be negative because we observed a higher share of the Participation group. For *THERMAL*, we expected a positive sign for the coefficient based on observations in Table 4. Meanwhile, we could not forecast the sign of *WIND*, as Table 4 presents a small difference in this variable between the two groups.

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Table 5. Estimation results

	Model 1	Model 2	Model 3	Model 4	Model 5
LAMOUNT	0.050	0.046	0.172**	0.170**	0.163**
	(0.038)	(0.039)	(0.045)	(0.045)	(0.046)
MATURITY	0.046**	0.047**	0.049**	0.050**	0.051**
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
FOREIGN	-0.730	-0.704	-0.556	-0.517	-0.480
	(0.389)	(0.392)	(0.408)	(0.411)	(0.405)
CLUB	0.257				
	(0.182)				
BILATE		-0.211			
		(0.174)			
BRIDGE			-0.036		
			(0.297)		
STANDBY			0.870**	0.864**	0.851**
			(0.164)	(0.163)	(0.162)
SOLAR					-0.130
					(0.153)
WIND				-0.158	
				(0.172)	
THERMAL				0.413*	0.400*
				(0.165)	(0.171)
CONST	-0.955**	-0.875**	-1.733**	-1.786**	-1.748**
	(0.189)	(0.196)	(0.253)	(0.258)	(0.273)
Sample	439	439	439	439	439
Pseudo R^2	0.048	0.047	0.099	0.115	0.115

Notes: **, and * indicate significance at the 1% and 5% levels, respectively.

3.2 Estimation results

Table 5 shows estimation results for five models. Two of the three variables of the first category, loan terms, present statistically significant results. The coefficient of *LAMOUNT* is positive, as we expected. This result is consistent with our observation about differences in the distribution of loan amount, and indicates that megabanks tend to finance larger-sized projects. *MATURITY* also presents statistically significant results for all models, and its coefficient is positive. This result demonstrates that megabanks participate in project finance with longer maturity periods. The third variable, *FOREIGN*, does not present significant results for any models. The comparative

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analysis of Table 4 presents a statistically significant difference in currency denomination between the two groups; however, the difference is small, and this variable does not affect the lending behavior of megabanks. Note that the share of US dollar for the Participation group is relatively high; however, we could not find a significant result in the probit model.

For the second category, distribution methods, both variables are not statistically significant. *CLUB* and *BILATE* do not affect the lending pattern of megabanks. Table 3 also presents an insignificant difference in these two variables. These results demonstrate that megabanks share a characteristic about loan distributions.

For facility types, *STANDBY* presents statistically significant results. Its sign is positive as we expected based on the examination in Table 3. Megabanks tend to participate in project finance in the form of standby credit. Meanwhile, *BRIDGE* does not affect the lending behavior of megabanks in spite that Table 3 presents a statistically significant difference between the two groups.

The last category is project types of three variables, *SOLAR*, *WIND*, and *THERMAL*. Only the results of *THERMAL* are statistically significant. Its sign is positive, as we expected. This result indicates that megabanks are likely to participate in project finance for thermal-power projects. We note that this investigation highlights differences in lending patterns between megabanks and other banks. Table 5 does not demonstrate differences in *SOLAR* and *WIND*, but we can confirm the characteristics that power generation projects occupy the top three in project-type ranking.

4. CONCLUSION

This study aimed to highlight characteristics of the lending behavior of Japanese megabanks in the US project finance market. This investigation also demonstrated the international competitiveness of megabanks increasing their presence in the US. This topic has social significance related to the growth strategy of megabanks confronting difficulties in domestic loan markets.

We investigated the lending behavior of megabanks using detailed transaction data, including loan terms and borrower characteristics. Our examination employed a comparative analysis and a probit model and focused on the period from 2013 to 2015. During this period, megabanks occupied the top three positions in the ranking of arranger banks in the US project finance market and showed their presence thoroughly.

Our main findings are summarized as follows. First, megabanks tend to participate in project financing of relatively large size and longer maturity periods. These

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characteristics can be explained by megabanks' management. They confront fierce competition in their domestic market because of low growth for the Japanese economy, creating competitive environment of decreasing interest rate margins. Hence, megabanks have placed a heavy emphasis on overseas business and aggressive risk-taking. Second, most transactions in which megabanks participate in are denominated in US dollar. This characteristic may be explained by the development of the interbank market. Megabanks can easily access US dollar funding because of abundant market liquidity and their good credit ratings. Their funding capability is a competitive advantage in the US market. Third, statistical examinations revealed that the probability that megabanks participate in loans for thermal-power projects is relatively high. Power generation project schemes are already established, and banks can more easily screen risks for such projects than for other types. We also observed that megabanks are likely to participate in project finance in the form of standby credit. However, we do not explain this characteristic, thus further investigation is required.

A possible extension of this research is to investigate the lending behavior of megabanks from the viewpoint of syndication networks. Syndication relationships are an important source of competitiveness in the project finance market. We assume that megabanks form competitive networks and thus gain a competitive edge. We further investigate what relationship megabanks form in the project finance market.

REFERENCES

[1] Harjoto, M., Mullineaux, D. J., and Yi, H., 2006, Loan pricing at investment versus commercial banks, *Financial Management*, Vol. 34 (4), pp. 49-70

[2] Haselmann, R. and Wachtel, P., 2011, Foreign banks in syndicated loan markets, *Journal of Banking & Finance*, 35, pp. 2679-2689

[3] Pessarossi, P., Christophe, J. C., and Weil, L., 2010, Foreign bank lending and information asymmetries in China, BOFIT Discussion Papers 20/2010, Bank of Finland

[4] Yamaguchi, M., 2015, Participation of Japanese regional banks in international syndicated loans: Lending behavior and explanatory factors, *Review of Integrative Business & Economics Research*, Vol 4(2), pp. 220-236

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