

**BANK MARKET STRUCTURE, PROPERTY RIGHTS AND FINANCIAL
FREEDOM EFFECTS ON CAPITAL STRUCTURE: EVIDENCE FROM ASIAN
DEVELOPING COUNTRIES.**

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***Abstract:** The paper aims to consider direct and indirect impacts of bank concentration, property rights and financial freedom on corporate leverage in 12 Asian developing countries from 2000 to 2013. Our result shows that bank concentration has a directly negative relationship with leverage in these countries. Highly concentrated banking market structure favors for profited firms to obtain debts and is considered as a solution against strong private property rights proxy. A strong private property rights decreases amount of debts financed by banking system and leads firms to prefer using internal funds to obtain protection advantages for newly established assets. Our results also indicate stronger degree of financial freedom encourages enterprise borrow more as well as supports for profitable firms and reduces the importance of collapse coverage in accessing debts whilst weaker degree of financial freedom leads to an increase of using trade credit as a substitute for bank loans.*

Keywords: leverage; financial freedom; property rights; bank concentration, direct and indirect impact.

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I. Introduction

Traditional research of firm capital structure mostly focuses on how the demand side (i.e. variables related to firm features) affects to debt level while recent papers extend the study to the effects of the supply side, macroeconomic conditions and legal system to firm choice of debt. However, most of the papers generally used a dataset of US or other international stable and steady markets while Asian developing countries with the advantage of rapid and consistent growth have not been properly analyzed¹. We start our research's motivation from the fact that banking system in Asian developing countries seems not sufficiently finance for the operation capital demand of domestic firms compared to it does in high income countries. Indeed, according to the database collected from surveys of more than 130,000 firms in 135 countries conducted since 2006 to 2014 by World Bank group, firms in developing countries are struggling more with difficulties in accessibility to finance than firms in advanced countries². Although the percentage of firms demanding for a bank loan in Asian and Pacific countries is higher compared to high income countries, percentage of capital demand financed by banking system in general Asian and Pacific countries is lower than this in advanced countries. According to recent studies, generally, firms possibly access more debts if banking market structure is more concentrated. However, contrary to developed economies like US and European countries, where banking market structure has become gradually more concentrated, the market concentration of banking system in Asian developing countries are remarkably dropped during the last 14 years, from 2000 to 2013. The banking concentration ratio of Asian developing countries also deviates above the world

¹ Figure 1 shows real GDP annual trend at world, advanced economies, and developing Asian countries level. From 1997 to 2013, whilst annual average real GDP growth rate of advanced economies is around 1.2%, real GDP growth rate of emerging and developing Asian economies is maintained at much higher rate, around 8% annually. Sources: world economic outlook 2015 – World Bank organization.

² More than 22% of firms in Asian and Pacific countries in the survey identified that access to finance is a major constraint while this percent is only about 11% in high income OECD countries. Percentage of collateral value to loan amount required by bank supplies is only about 164% but this percentage is remarkably higher in Asian and Pacific countries at around 226%. In addition, percentages of working capital, investment, and firms with a bank loans are found relatively higher in high income countries than these percentage in general Asian and Pacific countries. Detail of this database can be downloaded at <http://www.enterprisesurveys.org/data/exploretopics/finance>.

average ratio and this gap only becomes closer in the most recent years³. Consequently, we assume that even bank market structure is highly concentrated, firm’s leverage properties in Asian developing countries, which are described as less liberalized economies with low indicator of property rights and financial freedom, might not be associated with less financial constraint as suggested by recent studies.

Figure 1: Cross- country Real GDP over time



Figure 2: Bank Concentration (BC) from 2000 - 2013

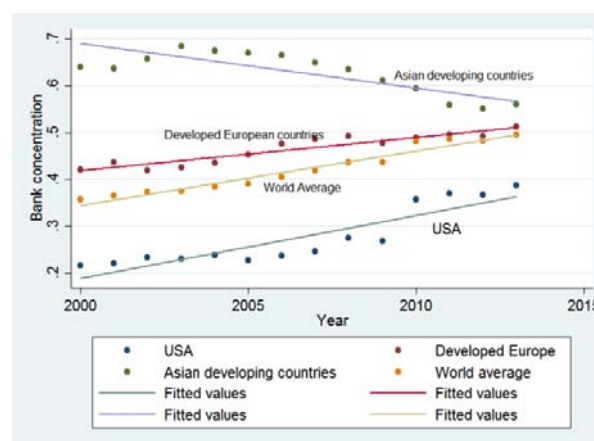


Figure 1 presents the moving trend of real GDP growth rate in percentage of advanced economies and developing Asian countries from 1997 to 2013. Source: World Economic Outlook – World Bank.

Figure 2 presents the yearly trend of average bank concentration in the period of 2000-2013. Average BC of Asian developing countries is estimated based on 12 countries which include: Bangladesh, China, India, Indonesia, Jordan, Malaysia, Philippines, Pakistan, Kazakhstan, Sri Lanka, Thailand and Vietnam while BC average of developed European Countries is estimated based on 12 high income countries which include: Germany, UK, Sweden, Switzerland, France, Italia, Spain, Norway, Israel, Ireland, Holland and Poland. Source: Bank Scope.

Therefore, our paper aims to analyze how firms’ debt-taking decision is affected directly by banking market structure, financial freedom and legal institutional environment in 12 Asian developing countries from 2000 to 2013. However, due to limitation on creditor rights database, for institutional factors, we only focus on the protection proxy of private property rights which favors for borrowers in lending relationship⁴. Our paper also considers indirect effects of bank concentration, financial freedom and property rights on corporate leverage through firm’s characteristics across countries. Finally, our paper continues studying indirect effects of market factors on firm capital structure choices through bank concentration and other bank supply variables longitudinally.

³ The trend of bank concentration in different areas is fully described in figure 2 “bank concentration (BC) from 2000 to 2013”. Bank concentrations of these 4 areas are converted approximately to 0.5 in 2013.

⁴ Our database on credit rights are measured follows 4 criteria of La Porta et al, (1998). However, we have only data for the years from 2000 to 2002 by Djankov et al. (2007). For the years from 2003 to 2013, we assumed they are unchanged and equal to creditor rights index of year 2014 given by World Bank.

Our study firstly contributes to current capital structure literature as being the first paper indicates that: contrary to developed countries like US market or European countries, bank concentration is negatively related to leverage level of firms in Asian developing countries. Our result implies that, during the last 14 years, banking system in Asian developing countries generally has increased the number of banks or reduced bank concentration level to satisfy credit demand of firms. However, our paper also suggests that, periodically, banking system, reversibly adjusts its concentration to best satisfy capital demand of its customers.

Secondly, our study provides a clear analysis on the effect of property rights to debt ratio and interaction of property rights to the determinants of debt. Our result shows that capital structure drops with stronger protection of property rights. In a more advanced degree of property protection, firms earn higher profit are less likely to accept external funds. They tend to use internal funds as referred in pecking order theory. Unlike V.M González and F. González (2008), we find that bank concentration is a solution for banking system in strong property rights force to reduce the agency costs from borrowers. In a better property rights environment, long-term leverage increases with concentration level of bank market structure.

Thirdly, we add to the literature study of financial liberalization on capital structure by considering financial freedom in our model. The result is consistent when we find firms obtain more long-term debts if credit market is more liberalized and highly concentrated. Country with less government control opens wider gates for small, less fixed assets and profited firms in facilitating access to debts.

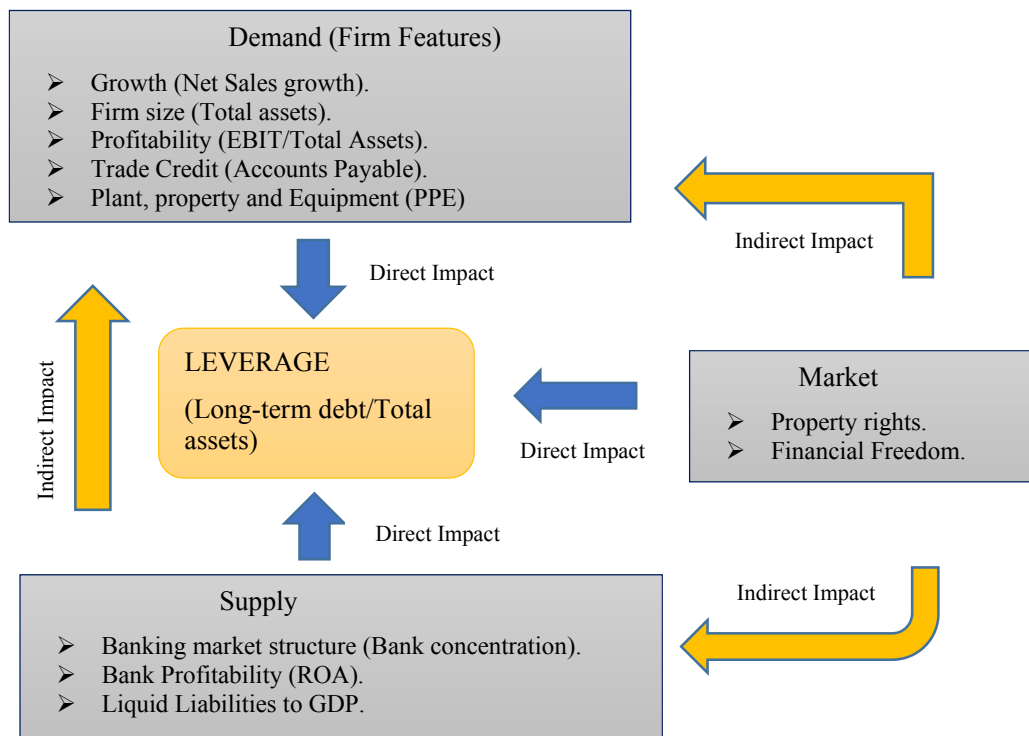
The paper is organized by the following structure. Section II focuses on Literature background and hypothesizes. Section III works on Data and Methodology. Section IV discusses our main empirical findings. And the last section, section V, is a thorough summary of our paper.

II. Literature Review and Hypothesis background

Recent studies show that although firm characteristics are the major factors, supply and market variables also play important roles in determining debt decision. For the traditional analysis emphasized on firm characteristics, Harris and Raviv (1991) describes “general principles” for the relationships between fixed assets, non-debt tax shield, advertising expenditure, growth opportunities, firm size, research and development

expenditure, profitability and leverage. Lemmon et al. (2008), Frank and Goyal (2009) continue analyzing the importance of firm-specific factors to debt decision for US market, while other papers such as Rajan and Zingales (1995), Boot et al. (2001), Gungoraydinoglu and Oztekin (2011), Ameer (2012), Jõeveer (2013) include country-specific factors like gross domestic product (GDP), tax, inflation, institutional environment, liberalization as other important variables determining firm debt ratio. Many other papers focus on the analysis of firm's accessibility to bank loan supply market through the consideration of how lending relationship and banking market structure affect firm leverage (Petersen and Rajan, 1994; Leary, 2009; V.M González and F. González 2008). Our study continues the growing literature on corporate capital structure by analyzing a complex direct and indirect relationship between firm's leverage and its determinants from demand, supply and market aspects. We focus on two main effects of these three groups to leverage ratio. The first pathway examines how well each single factor of these three groups directly explains corporate leverage, while the second pathway focuses on the indirect impacts of market factors to firm leverage through adjusting the effect of demand and supply variables on leverage; and on the indirect impacts of banking market structure to firm leverage through adjusting the effect of demand variables on leverage. Direct and indirect relationship of corporate debt and its determinants are expressed in figure 3 below.

Figure 3: Demand, Supply and Market determinants of Corporate leverage



The variables within these three groups we are going to use in debt-decision analysis are described in figure 3. However, direct effects of demand determinants to corporate leverage have been settled as “general principles” (Harris and Daviv, 1991) and other studies over decades, therefore, our paper concentrates more on the direct and indirect effects of supply and market factors on debt decisions. In addition, although creditor rights has been widely analyzed in recent capital structure studies, due to limitation of data collection, we decided not to include creditor rights in our main analysis. We only consider creditor rights as a control variable at the end of the paper to see how it works and whether adding creditor rights affects our main results or not. For supply side, we focus on the banking market structure effect because this variable is more directly related to firm loan accessibility.

Recent empirical literature found an international evidence to prove a highly concentrated banking market structure will favor firm’s use of external funds. Petersen and Rajan (1994, 1995) find that a less concentrated credit market increases the costs and decreases the sources of credit for small US firms. They suggest banks are likely to lend more when financial intermediates are shrunk because they can internalize the benefits of assisting these small firms. V.M González and F. González (2008), by analyzing 12,049 firms from 39 developed and developing countries, conclude a positive correlation between bank concentration and capital structure. In addition, Ratti et al. (2008) also suggest a negative relation between bank concentration and firm’s financial constraint in European countries from 1992 to 2005. However, evidences for contradictory effect of bank concentration and firm leverage also presented. Degryse and Ongena (2005) consider 145 banks in Belgium and figure that an increase in the number of banks (competitors) would increase the chance for lower-quality firms to obtain credit, and highly concentrated banking market slightly increases the loan rates of banks. Beck et al. (2006) in their study also find evidence to show that firms are more likely to receive financing obstacle in less developed countries. In the highly concentrated structure, lending market is leaded by the group of large banking institutions, which is indicated to be better in using “hard” information; while in the market with lower level of concentration, smaller banking institutions, which characterized by the use of “soft” information, are expected to have a better participation in satisfying capital demand of small and medium firms (Berger et al. 2005 and Carter and McNulty, 2005). In Asian developing countries, where the asymmetric information highly exists and the quality of “hard” information is insufficiently appropriate, in accordance with the fact

that these countries are generally in high level of bank concentration but lower percentage of bank loan, we develop our first hypothesis as follows:

Hypothesis 1a: bank concentration is negatively correlated to the firm leverage in Asian developing countries (i.e. debt ratio is estimated to be lower in country with highly concentrated banking market structure and vice versa).

When banking market is more concentrated, the importance of determinants from demand side might change. Banking system is less competitive, large banks earn more power. Consequently, they can favor for firms with better debt repayment capacity rather than large firms or firms with large tangible assets. Therefore, our hypothesis for indirect impact of bank concentration in firm's characteristics is as follows:

Hypothesis 1b: high bank concentration supports for high profitability firms while it reduces the importance of tangible assets and large firms in facilitating access to debt.

Empirical study on the development of legal system supports for a positive relationship between developed institutional system and firm's choice of external funding. An effective legal system favors external funds used by firms while firms are more incentive to use internal sources to finance for their demand (Fan et al., 2012; Qian and Strahan, 2007) if legal system is weak. More particularly, another study by V.M González and F. González (2008) indicates that agency costs of external funds lead to a decrease in firm leverage when the level of property right increases. They also find that firm leverage decreased in higher property rights environment. In addition, under supply-side point of view, stronger protection of property rights increases agency costs to creditors, therefore banks are also not willing to provide debt to borrowers if private property is highly protected from the government. Consequently, we develop the second hypothesis as:

Hypothesis 2a: strong proxy of property rights increases agency costs to credit suppliers and therefore it is supposed to have negative relationship with debt ratio;

In a country with strong legal protection of property rights proxy, firms would use their internal resources to finance for new project to build new assets that they might have better protection on those assets afterward. In this case, from demand prospective, we believe that profitable firms would use less debts than expected if property rights environment is strong. In addition, agency costs for financial institutions increases when private property rights increases. To solve the agency cost problem, banking system can increase their competitive powers through size enlargement or simply through encouragement of profitable

firms to borrow more. Large firms or firms with high collapse coverage ability become less attractive due to the rising of bankruptcy agency costs. Therefore, we assume that indirect impact of property rights to bank concentration and to firm characteristics on leverage based on supply point of view as follows:

Hypothesis 2b: High concentration is used as a solution of banking system against agency costs driven from strong property rights.

Hypothesis 2c: Strong proxy of private property rights makes firms with large tangible assets less attractive to the bank while profitable firms is supposed to have advantages on gaining more debt.

Another financial obstacle that firms in transition economies are facing is the lower level of financial market openness compared to advanced economies or even to the world average level. High control of government on financial system, tight regulations which decrease competition of foreign banks, and high influence on credit allocation, directly and indirectly reduce firms' accessibility to credit supply. In fact, financial institutions with high degree of government ownership are mainly considered as organizations created to solve for market failures or to give credits for some firms located in some specific industries, which are mostly set up to maximize social benefits, while private banks are not willing to finance for these specific firms due to failure of taking social benefits into account (Stiglitz and Weiss, 1981). Another view point is that state-owned banks are supposed to help the government to transmit the monetary policy (Micco and Paniza, 2006) rather than focus on operating performance. In this case, openness to foreign banks is one of solutions to improve credit allocation. Lucey and Zhang (2011) conducted a study on the relationship between financial integration and firm capital structure and found that higher level of openness to credit market increases corporate leverage in 24 developing countries. Therefore, we continue our third hypothesis for the direct impact of financial freedom on leverage as:

Hypothesis 3a: Higher financial freedom is positively related to firm leverage level.

However, when firms obtain more accessibility to finance and less dependent in financial institutions, credit market might be driven by customer instead of financial institutions, banking system might pool back to high concentration structure, as the recent trend of the world average we observed in Figure 2, to be able to provide more debt. In this case we have:

Hypothesis 3b: Financial freedom creates a positive influence on bank concentration effect on firm leverage ratio.

In addition, high degree of financial freedom means less control of the government on banking system and more participation of foreign banks. Financial system becomes more effective and competitive. More types of financial services are provided. Credit is allocated based on the balance of demand and supply. In this case, for high financial freedom system, loans will not be only for large firms or firms with high bankruptcy coverage. Moreover, when the access gate to credit supplier become wider, trade credit is no longer the top priority substituting for financial constrain. Therefore, we continue hypothesis on the indirect impact of financial freedom on corporate leverage as:

Hypothesis 3c: Financial freedom reduces the importance of trade credit substitution on debt and facilitates loan accessibility to profitable firms.

III. Methodology and Database

1. Model Specification

Our paper follows traditional dynamic capital structure model that has been studied in prior researches. The model states that, if there exists an optimal level of debt, firm partially adjusts its current debt to this optimal level at a given adjustment speed, λ :

$$BDR_{i,t} - BDR_{i,t-1} = \lambda (BDR^*_{i,t} - BDR_{i,t-1}) \quad (1)$$

In which : $BDR_{i,t}$ is book debt ratio and measured as ratio of long-term debt to total assets of firm i at time t . $BDR^*_{i,t}$ stands for firm's target debt ratio of firm i at time t .

Transform equation (1), we have:

$$BDR_{i,t} = \lambda BDR^*_{i,t} + (1 - \lambda) BDR_{i,t-1} \quad (2)$$

Because the optimal leverage is unobservable, as mentioned in our introduction and literature review, we assume it should be the one best fits the constraints of demand, supply and market factors. Target long-term debt is determined as follows:

$$BDR^*_{i,t} = \alpha_0 + \alpha_1 X_{i,t} + \alpha_2 Y_{k,t} + \alpha_3 Z_{k,t} + \mu_{i,t} \quad (3)$$

In which $X_{i,t}$, describes demand factors which include growth rate of net sales (GROWTH), firm's profitability (PROFIT), firm size (FIRMSIZE), payable accounts (TRCREDIT), and tangible assets (PPE).

The second group, denoted as $Y_{k,t}$, are supply variables. We incorporate 3 main variables into supply group. These variables are bank concentration (BC5), bank profitability (BROA) and liquid liabilities or lending capacity of the country (LENCAP).

The third group, denoted as $Z_{k,t}$, presents market factors. We consider property rights (PRORIGHT) and financial freedom (FINFREE) as two main variables presenting for market determinants of debt.

Substitute (3) into (2), we have :

$$BDR_{i,t} = \gamma_0 + \gamma_1 X_{i,t} + \gamma_2 Y_{k,t} + \gamma_3 Z_{k,t} + (1 - \lambda) BDR_{i,t-1} + \mu_{i,t} \quad (4)$$

Equation (4) can also be expressed in detail for empirical test as follows:

$$BDR_{i,t} = \beta_0 + (1 - \lambda) BDR_{i,t-1} + \beta_1 PROFIT_{i,t} + \beta_3 PPE_{i,t} + \beta_4 GROWTH_{i,t} + \beta_5 FIRMSIZE_{i,t} + \beta_6 TRCREDIT_{i,t} + \beta_7 BC5_{k,t} + \beta_8 BROA_{k,t} + \beta_9 LENCAP_{k,t} + \beta_{10} FINFREE_{k,t} + \beta_{12} PRORIGHT_{k,t} + \mu_{i,t} \quad (5)$$

In which: $\mu_{i,t} = \sigma_k$ (country unobserved time invariant effect) + v_i (firm unobserved time invariant effects) + $\varepsilon_{i,t}$ (error term)

2. Empirical Methodology

From equation 4, it is obviously to see that our model is a traditional dynamic model of panel data which contains one lagged dependent variable on the right hand side; hence, we decided to use generalized-method-of-moments (GMM) estimator, suggested by Arellano and Bond (1991). GMM method aims to fix the upward bias and downward bias problems of the lagged variable's estimated coefficient caused by conventional OLS and fixed effect estimation respectively in empirical test for dynamic model with T small and N large (Nickell, 1981).

GMM estimator also specifies to handle with these following issues of our model: (1) existence of unobserved country and firm fixed effects by taking first difference of explanatory variables; (2) autoregressive problem from one-lagged dependent variable $BDR_{i,t-1}$ (LBDR) in the right hand side of equation (5) by using two-to-four lags of BDR as instruments. We apply two step estimation for the two-step covariance matrix as it seems to be more efficient than GMM one-step estimator (Windmeijer, 2005). We use robust clustered standard estimator of the variance-covariance matrix of the parameters to eliminate industry effects and fix for any pattern of heteroskedasticity and autocorrelation within panels.

3. *Variable Estimation and Data treatment*

Our database is collected from World Scope for firm's characteristics; from Bank Scope and World Bank for supply variables; and from heritage foundation website for market variables⁵. Those variables are gathered annually for the period from 2000 to 2013.

For demand variables, we consider the prospective growth rate of firm by calculating the yearly growth rate of net sales while firm size or production capacity, is measured by relative percentage ratio of its total assets compared to total assets of the whole country. Earnings before interest and tax to total assets ratio is defined as firm's profitability. This variable shows the capacity of firms in order to fulfill debt repayment as well. Trade credit browses another source that firm is able to use instead of borrowing debt. Tangible assets variable determines collapse coverage capacity that firm can meet as if bankruptcy occurs. In order to make our empirical result work properly, only listed, non-financial and domestic firms with at least 4 consecutive years and using long-term debt in the studying period are taken into account. We eliminate mistaken data in our sample by dropping all the data with negative values of fixed assets and of total assets. And we also eliminate the data with book debt ratio of over 0.9 to avoid potential financial distressed companies.

For supply factors, the first variable, bank concentration, is estimated following Bikker and Haaf (2002), k- bank concentration idea. We measured this variable as total assets of 5 largest banks to the entire market total assets (BC5). The second variable is profitability of banking system which is measured by bank average return on total assets; and the last variable to measure the development of lending supply market is national liquid liabilities to GDP or lending capacity of financial system (LENCAP), estimated by a total of Mo, M1, M2 plus other funding sources available in the market⁶. For database collected from Bank-scope, firstly, we drop all multi-lateral government banks, securities firms, central

⁵ Financial freedom and property rights are measured by the heritage foundation website. It is distributed freely through www.heritage.org

⁶ The definition of liquid liabilities is provided by World Bank; by which liquid liabilities, denoted as M3, is "the sum of currency and deposits in the central bank (M0), plus transferable deposits and electronic currency (M1), plus time and savings deposits, foreign currency transferable deposits, certificates of deposit, and securities repurchase agreements (M2), plus travelers checks, foreign currency time deposits, commercial paper, and shares of mutual funds or market funds held by residents."

bank, investment & trust corporations, bank holding & holding companies, clearing institutions & custody, in order to collect only institutes that provide loans directly to firms. In addition, we drop the iterative duplicates of given bank having the same set of name, total assets, consolidated code in one year. We continue drop duplicates of the same bank but giving more than one type of financial report by favoring for consolidated code C1/C2 over C* and consolidated code U1/U2 over U*.⁷ Finally, due to problem of currency differences, we convert all the currency of our data into million US dollar to accurately estimate our bank concentration ratio.

The last group contains financial freedom (FINFREE) and property rights (PRORIGHT) of the country. This first variable, PRORIGHT, aims to show how legal environment protects individual rights on property and how the government enforces those laws in practice while the second variable, FINFREE, shows how easily customers can access credit and the independence of financial system from the control of the government. Property rights is scored ascendingly from 0 to 100 by the efficiency of legal system and government enforcement on property rights. Higher score implies stronger protection of private property. Financial freedom is an index by combining 5 broad indicators, including government regulation degree on financial services; the extent of state intervention in financial system through government ownership; development of financial and capital market development; influence on credit allocation of the government; and openness to foreign competition. Financial freedom ascends from 0 to 100, with higher value indicates higher independent level of financial sector from government interference. In our paper, we divide the values of PRORIGHT and FINFREE to 100 to get comparable values with values of dependent variable. Table 1 shows statistical description of our database.

⁷ For Bank-scope data treatment, we based on the idea suggested from a working paper by Duprey and Lé, January 15, 2015 to treat for duplicates. However, we see that there exist a lot of cases that one bank can have different bvdid number in the same year, therefore we use name of bank to identify and remove duplicates rather than bvdidnum as recommended in Duprey and Lé paper.

Table 1: Statistical Description

Country	Obs	BDR	PPE	GROWTH	lnTA	SIZE	TR					PRORI	
							CREDIT	PROFIT	LENCAP	FINFREE	BC5		BROA
<i>Bangladesh</i>	167	0.145	0.481	1.280	16.02	0.05111	0.061	0.141	0.619	0.204	0.382	0.014	0.229
<i>China</i>	22749	0.073	0.336	1.232	14.67	0.00061	0.094	0.062	1.545	0.310	0.629	0.008	0.241
<i>Indonesia</i>	4027	0.146	0.399	1.253	20.72	0.00333	0.105	0.069	0.372	0.369	0.556	0.019	0.310
<i>India</i>	18546	0.183	0.366	1.261	14.94	0.00075	0.135	0.085	0.687	0.355	0.389	0.010	0.500
<i>Jordan</i>	876	0.068	0.390	1.180	10.33	0.01531	0.056	0.036	1.246	0.625	0.778	0.013	0.539
<i>Kazashtan</i>	146	0.137	0.530	1.203	16.83	0.06164	0.078	0.132	0.345	0.537	0.673	-0.032	0.313
<i>Malaysia</i>	9441	0.090	0.375	1.157	12.55	0.00146	0.088	0.053	1.231	0.400	0.474	0.015	0.517
<i>Pakistan</i>	2057	0.158	0.498	1.208	15.42	0.00666	0.092	0.100	0.411	0.404	0.566	0.013	0.300
<i>Philippines</i>	2191	0.108	0.372	1.181	15.37	0.00634	0.069	0.045	0.571	0.486	0.550	0.013	0.364
<i>Sri Lanka</i>	1444	0.094	0.499	1.216	14.50	0.00933	0.083	0.086	0.365	0.390	0.711	0.013	0.450
<i>Thailand</i>	9182	0.129	0.383	1.171	15.00	0.00150	0.100	0.081	1.017	0.575	0.564	0.010	0.527
<i>Viet nam</i>	3715	0.101	0.289	1.251	19.81	0.00260	0.106	0.096	1.040	0.300	0.548	0.014	0.126
<i>Average</i>		0.119	0.410	1.216	15.513	0.0134	0.089	0.082	0.787	0.413	0.568	0.009	0.368

This table presents summary statistics of our database by country. The data is presented in average value of each variable. BDR is book debt ratio between long-term debt to total assets; PPE is property, plant and equipment to total assets; GROWTH is the growth rate of Sales of current year to Sales of previous year; lnTA denotes for natural logarithms of total assets; SIZE defines firm size, estimated by total assets of each firm to the nationwide sum of total assets; PROFIT is profitability, estimated from EBIT to total assets; TRCREDIT expresses the ratio of payable accounts to total assets; LENCAP is liquid liabilities to GDP of the country; FINFREE show the efficiency of financial system. BC5 defines bank concentration, denoted as a fraction of total assets held by 5 largest banks in each country; BROA shows profitability of bank, driven from net income to total assets; EARN_GAP which is the earning gap between lending rate and saving rate, defines for the cost of loans; PRORIGHT measures how strong legal system protects rights of private property.

Our sample covers 12 developing countries including Bangladesh, China, India, Indonesia, Jordan, Kazakhstan, Malaysia, Pakistan, Philippines, Sri Lanka, Thailand and Vietnam⁸. By observing the detailed statistical description of our dataset, we decided to winsorize our data at 1% level to decrease deceived effect on our results driven by extreme outstanding values. Final sample includes 8391 firms with 74,541 firm-year observations. The sample shows a low average level of book debt ratio in Asian developing countries but approximately equal to the average debt ratio of 48 countries mentioned in S. –S. Cho et al. (2014). The signal of developing countries are clearly shown by high proportion of fixed assets to total assets (41%) and high government control in financial system.

⁸ The term of “developing countries” is defined by World Bank as countries with gross national income (GNI) per capital less than \$4,125 per year.

IV. Empirical Results

As presented in previous sections, our empirical tests focus on two pathways of independent variables' effects on corporate debt.

1. Direct Effects

Table 2 presents influences of each single variable within 3 groups (pattern 1 in diagram 1) on firm's choice of debts. We found that firms in Asian developing countries do have a target debt ratio when all the determinants of debt are significant and nontrivial. The coefficient of lagged book debt ratio is approximately 0.72, which indicates that adjustment speed to target debt ratio equals to 0.28. This implies, in average, firm mitigates approximately 28% of the gap between actual leverage ratio to target leverage ratio each year. Our result shows an approximate value of the speed adjustment rate, 30%, which have been found by Flannery and Rangan (2006) for US market and 34% found by V.M González and F. González (2008) for international market. Our results also confirm "general principle" presented by Harris and Daviv (1991) and are consistent with Rajan and Zingales (1995), Booth et al. (2001), Fama and French (2002) when positive relationships between firm's PPE, firm's SIZE and debt ratio are presented. Higher values of these variables imply higher level of long-term debt used by firms. However, our study shows a contrary of firm's growth coefficient sign to the growth coefficient sign measured by Tobin's Q in Rajan and Zingales (1995) and V.M González and F. González (2008). Our study indicates that firm borrows more when they are more prospective in growth rate of sales. We also found that the coefficient of trade credit to long-term debt is negatively significant. This indicates that accounts payable plays as another capital source to substitute for loans from banking system. The traditional negative relation between profitability and debt, which support for pecking order theory and most recently stated by S.-S. Cho et al. (2014), is also confirmed for Asian developing countries in our study. By that, firms in Asian developing countries seem prefer to use internal funds instead of debt to finance for its investment demand to avoid asymmetric information and agency cost of debts. In addition, the fact of high lending interest rates in Asian developing countries might best explains for negative coefficient of firm's profit to debt. Average lending interest rate of 12 Asian developing countries during

the last 14 years maintains high, approximately at 13.5%, while average lending interest rates in US, UK and Japan within this period stay at much lower rate, less than 6% annually⁹.

Table 2: Direct Impact of demand, supply and property rights on leverage

	(1)	(2)	(3)	(4)	(5)
<i>Demand</i>					
LBDR	0.710*** (0.0159)	0.723*** (0.0146)	0.720*** (0.0148)	0.720*** (0.0148)	0.721*** (0.0148)
PPE	0.0667*** (0.00433)	0.0622*** (0.00393)	0.0628*** (0.00398)	0.0628*** (0.00398)	0.0628*** (0.00398)
GROWTH	0.00784*** (0.000827)	0.00804*** (0.000817)	0.00809*** (0.000817)	0.00809*** (0.000817)	0.00806*** (0.000816)
SIZE	0.193** (0.0812)	0.291*** (0.0921)	0.291*** (0.0930)	0.285*** (0.0915)	0.281*** (0.0910)
TRCREDIT	-0.0348*** (0.00393)	-0.0586*** (0.00439)	-0.0594*** (0.00442)	-0.0594*** (0.00442)	-0.0594*** (0.00442)
PROFIT	-0.0817*** (0.00501)	-0.0977*** (0.00541)	-0.0985*** (0.00544)	-0.0984*** (0.00544)	-0.0988*** (0.00544)
<i>Supply</i>					
BC5			-0.0198** (0.00881)	-0.0303*** (0.0104)	-0.0214* (0.0110)
LENCAP			0.0199*** (0.00509)	0.0233*** (0.00536)	0.0290*** (0.00552)
BROA			0.129** (0.0508)	0.127** (0.0502)	0.127** (0.0496)
<i>Market</i>					
FINFREE				0.0215** (0.0108)	0.0271** (0.0108)
PRORIGHT					-0.0431*** (0.0113)
Constant	0.00615*** (0.00149)	-0.0157 (0.00966)	-0.0179 (0.0114)	-0.0174 (0.0114)	-0.0118 (0.0114)
Observations	62,480	62,480	62,480	62,480	62,480
Number of ID	7,118	7,118	7,118	7,118	7,118
Country FE	NO	YES	YES	YES	YES
Time FE	NO	YES	YES	YES	YES
Robust clustered	YES	YES	Yes	Yes	Yes

Two-step GMM estimator for panel data is applied for empirical test. BDR is book debt ratio between long-term debt to total assets; PPE is property, plant and equipment to total assets; GROWTH is the growth rate of Sales of current year to Sales of previous year; SIZE is firm size, estimated by total assets of each firm to the nationwide sum of total assets; PROFIT is profitability, estimated from EBIT to total assets; LENCAP is liquid liabilities to GDP of the country; FINFREE show the efficiency of financial system. BC5 defines bank concentration, denoted as a fraction of total assets held by 5 largest banks in each country; BROA shows profitability of bank, driven from net income to total assets; PRORIGHT measures how strong legal system protects rights of private property. Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1.

⁹ From 2000-2014, annual lending interest rate of 12 Asian developing countries averagely started at around 17.3% in 2000 and reduced to 11.4% in 2014. In contrary, US, UK and Japan, averagely, provided loans with the interest rate of around 6% per year in 2000 and only at 1.7% per year in 2014. Source: World Development Indicator, World Bank.

For the supply side, our paper finds the same result with Booth et al. (2001) as liquid liabilities to GDP (LENCAP) is positively related to long-term debt. Higher money supply (M3) brings more capacity of giving loan to banking system. Therefore, firms have more opportunities to be financed by bank loans. We also find positive relation between bank return on total assets and firm leverage. The intuition is that giving loan plays a major role in earning profits of banks in developing countries; hence, when banks are more profitable or in a good performance condition, they tend to release more debts to borrowers. While bank profitability and national lending capacity are positively related to leverage ratio, our hypothesis 1a is confirmed when bank market structure is negatively related to firm choice of debt. Our result is contrary to V.M González and F. González (2008) and R.A. Ratti et al. (2008) but consistent with Degryse and Ongena (2005). Negative relationship between bank concentration and leverage supports for the fact that Asian developing countries are in strong capital demand for high economic development growth, therefore they need bank system becomes more competitive. The number of banks in Asian developing countries is expanded remarkably during the period of 2000 to 2013. As mentioned in Stein (2002), smaller banks are more concentrated on “soft” information while larger banks are more focused on “hard” information. Large banks are less effective in making lending relationships while smaller banks are better in doing that. Therefore, higher level of concentration increases the power of large banks and increases the potential of credit rationing. Lower level of concentration, in our sample, means more small financial providers in the market; hence, smaller firms receive more chances to facilitate access to credit market.

The other two hypothesis 2a and 3a on direct relationship between market factors and corporate leverage are also confirmed when we found property rights is negatively related to long-term debts and financial liberalization are positively linked to long-term debts. Positive coefficient of financial freedom to long-term debt in column (4) and (5) of table 2 implies that higher free and effective degree of financial market relaxes financial constraint. Coefficient of private property protection to leverage in column (5) is statistically negative significant at 1% and shown up at -4.3%. This result present increase in the value of property rights bring more lending agency costs to the banks and decrease corporate leverage.

2. Indirect Effects

Indirect impact of market factors on corporate leverage through supply variables

To analyze how credit market responds to changes in legal proxy and financial liberalization, we continue to run the test and come up with the results presented in table 3. Column (1) to (3) and (5) to (7) show the results of separately empirical test on each single supply variable while column (4) and column (8) present the results of empirical test on all three supply variables. Table 3 shows consistent and robust results for both separate and accumulative tests of indirect impact of market factors on corporate leverage through supply side. From table 3, our paper finds that all the influenced coefficients of credit supply variables on leverage affected by market factors, except the interaction term $\text{FINFREE} \cdot \text{LENCAP}$, are statistically significant and different than zero.

Our hypothesis 2b and 3b for the indirect pathways of market factor to firm leverage through supply side are confirmed when we find that both property rights and financial freedom positively increase the significance level of bank concentration coefficient to firm debt. These results indicate that in a strong proxy of property rights or in a high degree of financial freedom, country with more concentrated market structure intends to release more debts. Unlike V.M González and F. González(2008), which found no significant evidence for interaction between property right and bank concentration, our paper suggests that bank concentration substitutes for high proxy of private property protection and ease of firm's accessibility to credit supply sources. Particularly, in our study, when property rights index and financial freedom degree reach 40 grade upward, banking system is going to give more loans if they get more competitive power. We also found a negative influence of property rights to lending capacity and a positive influence of property rights on bank profitability effect on firm leverage. The result suggests even when lending capacity is high, banks do not prefer to give more debt unless they earn higher return to compensate for the potential agency costs of bankruptcy caused by strong proxy of property rights. We also found that, when banking system is more effective with less controlled from the government, it has a negative effect on coefficient of bank profitability to leverage. The result is reasonable for the fact that when firms are more accessible to debt market, bank's requirement of earning high profit to release debt becomes less important that it does as before. Finally, our result indicates that the effect of lending capacity on corporate leverage is independent with the degree of financial freedom in 12 Asian developing countries.

Table 3: Indirect impact of property rights and liberalization on leverage through credit supply

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Demand</i>								
LBDR	0.716*** (0.0149)	0.721*** (0.0148)	0.717*** (0.0149)	0.715*** (0.0149)	0.714*** (0.0150)	0.721*** (0.0148)	0.721*** (0.0148)	0.715*** (0.0150)
PPE	0.0641*** (0.00402)	0.0626*** (0.00399)	0.0638*** (0.00401)	0.0640*** (0.00403)	0.0643*** (0.00403)	0.0627*** (0.00398)	0.0628*** (0.00398)	0.0642*** (0.00403)
GROWTH	0.00813*** (0.000816)	0.00799*** (0.000816)	0.00809*** (0.000816)	0.00807*** (0.000815)	0.00806*** (0.000815)	0.00806*** (0.000816)	0.00807*** (0.000816)	0.00807*** (0.000815)
SIZE	0.279*** (0.0931)	0.287*** (0.0931)	0.274*** (0.0911)	0.282*** (0.0944)	0.275*** (0.0915)	0.280*** (0.0901)	0.281*** (0.0911)	0.275*** (0.0909)
TRACREDIT	-0.0604*** (0.00446)	-0.0595*** (0.00442)	-0.0601*** (0.00444)	-0.0606*** (0.00446)	-0.0608*** (0.00447)	-0.0595*** (0.00442)	-0.0595*** (0.00442)	-0.0609*** (0.00447)
PROFIT	-0.1000*** (0.00548)	-0.0994*** (0.00546)	-0.0994*** (0.00546)	-0.101*** (0.00549)	-0.101*** (0.00550)	-0.0989*** (0.00544)	-0.0989*** (0.00545)	-0.101*** (0.00551)
<i>Supply</i>								
LENCAP	0.0190*** (0.00567)	0.0217*** (0.00575)	0.0632*** (0.00788)	0.0399*** (0.00878)	0.0258*** (0.00554)	0.0285*** (0.00554)	0.0227** (0.0109)	0.0167 (0.0110)
BC5	-0.193*** (0.0247)	-0.0412*** (0.0117)	0.00939 (0.0123)	-0.128*** (0.0291)	-0.176*** (0.0234)	-0.0162 (0.0110)	-0.0253** (0.0123)	-0.178*** (0.0245)
BROA	0.108** (0.0487)	-0.876*** (0.176)	0.125** (0.0505)	-0.858*** (0.180)	0.118** (0.0485)	0.939*** (0.310)	0.125** (0.0500)	0.930*** (0.314)
<i>Supply</i>								
FINFREE	0.0249** (0.0108)	0.0112 (0.0112)	0.0237** (0.0108)	0.00782 (0.0113)	-0.234*** (0.0347)	0.0436*** (0.0123)	0.0146 (0.0223)	-0.239*** (0.0421)
PRORIGHT	-0.368*** (0.0428)	-0.0662*** (0.0115)	0.113*** (0.0260)	-0.161** (0.0627)	-0.0123 (0.0123)	-0.0412*** (0.0114)	-0.0440*** (0.0114)	-0.0110 (0.0124)
<i>Interaction</i>								
c.PRORIGHT#c.BC5	0.548*** (0.0687)			0.348*** (0.0762)				
c.PRORIGHT#c.BROA		3.640*** (0.590)		3.523*** (0.606)				
c.PRORIGHT#c.LENCAP			-0.126*** (0.0202)	-0.0900*** (0.0227)				
c.FINFREE#c.BC5					0.474*** (0.0609)			0.483*** (0.0612)
c.FINFREE#c.BROA						-1.438** (0.559)		-1.441** (0.564)
c.FINFREE#c.LENCAP							0.0148 (0.0216)	0.0200 (0.0219)
Constant	0.0870*** (0.0170)	0.0126 (0.0123)	-0.0632*** (0.0139)	0.0382* (0.0220)	0.0543*** (0.0143)	-0.0250** (0.0126)	-0.00532 (0.0152)	0.0512*** (0.0193)
Observations	62,480	62,480	62,480	62,480	62,480	62,480	62,480	62,480
Number of ID	7,118	7,118	7,118	7,118	7,118	7,118	7,118	7,118
Country FE	YES	YES	YES	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES	YES	YES	YES
Robust-Cluster	YES	YES	YES	YES	YES	YES	YES	YES

Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1. To save place we do not provide notation of our variables. Please look at table 2 for details.

Indirect impact of market factors on leverage through demand variables

We continue our analysis by considering how property rights and financial freedom affect to the coefficients of firm's determinants on leverage. Indirect impacts of property rights and financial freedom are presented in table 4 and table 5 respectively. In both tables, column (1) to column (5) shows the influence of property rights to each single firm's

characteristic separately, whilst column (6) presents influences of property rights to all firm's characteristics.

Table 4: Indirect impact of property rights on firm leverage through demand determinants

	(1)	(2)	(3)	(4)	(5)	(6)
<i>Demand</i>						
LBDR	0.721*** (0.0148)	0.720*** (0.0148)	0.721*** (0.0148)	0.721*** (0.0148)	0.720*** (0.0148)	0.720*** (0.0148)
PPE	0.0628*** (0.00398)	0.0629*** (0.00398)	0.0613*** (0.00711)	0.0628*** (0.00398)	0.0629*** (0.00398)	0.0644*** (0.00723)
GROWTH	0.00806*** (0.000817)	0.00758*** (0.00200)	0.00806*** (0.000817)	0.00798*** (0.000818)	0.00806*** (0.000816)	0.00600*** (0.00202)
SIZE	0.238 (0.243)	0.281*** (0.0911)	0.281*** (0.0911)	0.279*** (0.0915)	0.281*** (0.0911)	0.216 (0.246)
TRCREDIT	-0.0594*** (0.00442)	-0.0595*** (0.00442)	-0.0594*** (0.00442)	-0.0591*** (0.00442)	-0.0439*** (0.0105)	-0.0384*** (0.0108)
PROFIT	-0.0988*** (0.00544)	-0.0988*** (0.00544)	-0.0988*** (0.00544)	-0.0423*** (0.0142)	-0.0987*** (0.00545)	-0.0378*** (0.0143)
<i>Supply</i>						
BC5	0.0289*** (0.00551)	0.0290*** (0.00552)	0.0289*** (0.00552)	0.0294*** (0.00553)	0.0289*** (0.00552)	0.0294*** (0.00552)
LENCAP	-0.0211* (0.0110)	-0.0213* (0.0110)	-0.0212* (0.0110)	-0.0216** (0.0110)	-0.0212* (0.0110)	-0.0208* (0.0110)
BROA	0.126** (0.0504)	0.127** (0.0496)	0.127** (0.0496)	0.126** (0.0495)	0.127** (0.0496)	0.125** (0.0502)
<i>Market</i>						
FINFREE	0.0268** (0.0107)	0.0271** (0.0108)	0.0272** (0.0108)	0.0269** (0.0108)	0.0271** (0.0108)	0.0264** (0.0107)
PRORIGHT	-0.0434*** (0.0115)	-0.0448*** (0.0133)	-0.0447*** (0.0123)	-0.0329*** (0.0118)	-0.0397*** (0.0118)	-0.0330** (0.0151)
<i>Interaction</i>						
c.PRORIGHT#c.SIZE	0.109 (0.536)					0.165 (0.547)
c.PRORIGHT#c.GROWTH		0.00134 (0.00524)				0.00530 (0.00528)
c.PRORIGHT#c.PPE			0.00403 (0.0162)			-0.00398 (0.0166)
c.PRORIGHT#c.PROFIT				-0.140*** (0.0360)		-0.151*** (0.0364)
c.PRORIGHT#c.TRACREDIT					-0.0394 (0.0267)	-0.0525* (0.0276)
Constant	-0.0110 (0.0117)	-0.0113 (0.0115)	-0.0112 (0.0115)	-0.0178 (0.0115)	-0.0131 (0.0114)	-0.0169 (0.0121)
Observations	62,480	62,480	62,480	62,480	62,480	62,480
Number of ID	7,118	7,118	7,118	7,118	7,118	7,118
Country FE	YES	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES	YES
Robust-Cluster	YES	YES	YES	YES	YES	YES

Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1. To save place we do not provide notation of our variables. Please look at table 2 for details.

In table 4, we find positive interaction term of property rights on firm's size and firm's tangible assets. This indicates large firms and firms with high plant, property and equipment plan to borrow more to utilize their benefits in strong property rights environment. Unfortunately, we find no significance evidence for this conclusion. Similarly, insignificant results are found for the indirect effects of property rights on firm leverage

through growth. The indirect effect of property rights on firm debt through trade credit is not clear when we find insignificant result when we run the test separately and weakly significant at 10% when we run the test accumulatively. Only firm's profitability coefficient is statistically significant affected by property rights at 1% level. Negative value of interaction term $c.PRORIGHT\#c.PROFIT$ indicates that more profitable firms intend to borrow less in a stronger protection proxy of property rights. Therefore, instead of finding positive impact of property rights on debt through firm's profit as assumed in our hypothesis 2c, our result supports for the opposite hypothesis: profitable firms prefer to use internal funds to finance for new project investment to obtain the benefits of high protection policy on private property for newly established assets.

Table 5: Indirect Impact of Financial freedom on leverage through demand determinants

	(1)	(2)	(3)	(4)	(5)	(6)
LBDR	0.719*** (0.0149)	0.720*** (0.0148)	0.720*** (0.0149)	0.720*** (0.0148)	0.721*** (0.0148)	0.719*** (0.0149)
PPE	0.104*** (0.00904)	0.0629*** (0.00399)	0.0628*** (0.00399)	0.0629*** (0.00398)	0.0630*** (0.00399)	0.106*** (0.00926)
GROWTH	0.00806*** (0.000817)	0.00463 (0.00301)	0.00805*** (0.000817)	0.00814*** (0.000819)	0.00806*** (0.000817)	0.00618** (0.00300)
SIZE	0.275*** (0.0920)	0.280*** (0.0909)	0.554* (0.300)	0.276*** (0.0909)	0.279*** (0.0910)	0.523* (0.302)
TRCREDIT	-0.0588*** (0.00440)	-0.0594*** (0.00442)	-0.0597*** (0.00442)	-0.0596*** (0.00442)	-0.0246* (0.0130)	-0.00812 (0.0134)
PROFIT	-0.0988*** (0.00545)	-0.0987*** (0.00545)	-0.0989*** (0.00545)	-0.146*** (0.0166)	-0.0989*** (0.00545)	-0.139*** (0.0164)
LENCAP	0.0302*** (0.00548)	0.0283*** (0.00546)	0.0231*** (0.00563)	0.0287*** (0.00546)	0.0280*** (0.00546)	0.0301*** (0.00550)
BC5	-0.0270** (0.0110)	-0.0225** (0.0110)	-0.0111 (0.0112)	-0.0225** (0.0110)	-0.0235** (0.0110)	-0.0274** (0.0111)
BROA	0.128** (0.0507)	0.130** (0.0509)	0.124** (0.0509)	0.132** (0.0512)	0.131** (0.0510)	0.127** (0.0515)
FINFREE	0.0687*** (0.0129)	0.0160 (0.0149)	0.0216* (0.0114)	0.0177 (0.0115)	0.0367*** (0.0113)	0.0712*** (0.0180)
PRORIGHT	-0.0406*** (0.0114)	-0.0432*** (0.0113)	-0.0616*** (0.0112)	-0.0421*** (0.0113)	-0.0435*** (0.0113)	-0.0398*** (0.0113)
<i>Indirect Impact</i>						
c.FINFREE#c.PPE	-0.105*** (0.0190)					-0.110*** (0.0194)
c.FINFREE#c.GROWTH		0.00922 (0.00813)				0.00528 (0.00807)
c.FINFREE#c.SIZE			-0.586 (0.553)			-0.527 (0.563)
c.FINFREE#c.PROFIT				0.120*** (0.0381)		0.102*** (0.0375)
c.FINFREE#c.TRACREDIT					-0.0909*** (0.0328)	-0.133*** (0.0339)
Constant	-0.0267** (0.0123)	-0.00507 (0.0120)	-0.00290 (0.0115)	-0.00485 (0.0117)	-0.0112 (0.0116)	-0.0321*** (0.0121)
Observations	62,480	62,480	62,480	62,480	62,480	62,480
Number of ID	7,118	7,118	7,118	7,118	7,118	7,118
Country FE	YES	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES	YES
Robust cluster	YES	YES	YES	YES	YES	YES

Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1. To save place we do not provide notation of our variables. Please look at table 2 for details.

Table 6: Indirect Impact of Bank concentration on firm leverage through demand determinants

	(1)	(2)	(3)	(4)	(5)	(6)
LBDR	0.721*** (0.0147)	0.721*** (0.0148)	0.720*** (0.0149)	0.719*** (0.0148)	0.721*** (0.0148)	0.719*** (0.0148)
PPE	0.125*** (0.0121)	0.0628*** (0.00398)	0.0627*** (0.00398)	0.0623*** (0.00396)	0.0628*** (0.00398)	0.118*** (0.0122)
GROWTH	0.00803*** (0.000816)	0.00802** (0.00370)	0.00804*** (0.000817)	0.00796*** (0.000817)	0.00804*** (0.000817)	0.0142*** (0.00374)
SIZE	0.283*** (0.0930)	0.280*** (0.0910)	1.218** (0.477)	0.263*** (0.0901)	0.280*** (0.0907)	1.212*** (0.462)
TRCREDIT	-0.0580*** (0.00438)	-0.0594*** (0.00442)	-0.0595*** (0.00441)	-0.0599*** (0.00444)	-0.0907*** (0.0186)	-0.0775*** (0.0192)
PROFIT	-0.0974*** (0.00540)	-0.0988*** (0.00544)	-0.0990*** (0.00545)	-0.314*** (0.0280)	-0.0987*** (0.00544)	-0.322*** (0.0280)
LENCAP	0.0308*** (0.00555)	0.0290*** (0.00552)	0.0259*** (0.00579)	0.0258*** (0.00551)	0.0288*** (0.00552)	0.0304*** (0.00567)
BC5	0.0240* (0.0129)	-0.0216 (0.0135)	-0.00430 (0.0113)	-0.0508*** (0.0115)	-0.0272** (0.0115)	0.00288 (0.0158)
BROA	0.122** (0.0490)	0.127** (0.0496)	0.120** (0.0492)	0.126** (0.0501)	0.126** (0.0495)	0.118** (0.0494)
FINFREE	0.0283*** (0.0108)	0.0271** (0.0108)	0.0231** (0.0110)	0.0249** (0.0109)	0.0272** (0.0108)	0.0327*** (0.0110)
PRORIGHT	-0.0401*** (0.0114)	-0.0431*** (0.0113)	-0.0646*** (0.0112)	-0.0371*** (0.0114)	-0.0430*** (0.0113)	-0.0368*** (0.0114)
<i>Indirect impact</i>						
c.BC5#c.PPE	-0.117*** (0.0191)					-0.105*** (0.0194)
c.BC5#c.GROWTH		9.90e-05 (0.00657)				-0.0120* (0.00661)
c.BC5#c.SIZE			-1.484** (0.640)			-1.497** (0.619)
c.BC5#c.PROFIT				0.412*** (0.0498)		0.429*** (0.0497)
c.BC5#c.TRACREDIT					0.0611* (0.0340)	0.0376 (0.0353)
Constant	-0.0404*** (0.0125)	-0.0118 (0.0122)	-0.0180 (0.0121)	0.0115 (0.0116)	-0.00887 (0.0115)	-0.0409*** (0.0140)
Observations	62,480	62,480	62,480	62,480	62,480	62,480
Number of ID	7,118	7,118	7,118	7,118	7,118	7,118
Country FE	YES	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES	YES
Robust cluster	YES	YES	YES	YES	YES	YES

Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1. To save place we do not provide notation of our variables. Please look at table 2 for details.

Table 6 shows how banking market structure affects demand determinants of firm long-term debt. Single influence of bank concentration on each firm's characteristics is presented from column (1) to (5) while column 6 describes influence of bank concentration on all 5 firm's characteristics. We found that all the interaction impacts of bank concentration on firm's demand determinants of debt are contrary to original coefficients of these variables. Our hypothesis 1b is confirmed when the results suggest that concentrated banking system reduces the positive effect of PPE and SIZE coefficients on long-term debts but

brings positive effects on coefficient of firm profitability to long-term debt. A highly concentrated banking market reduces the importance of large firms and firms with high collapse coverage in term of assets. Moreover, when banking market is more bounded by large banks, they support for high profitable firms in order to release more credit. However, indirect impacts of bank concentration on firm leverage through trade credit and firm growth are unclear when the coefficient of interaction term between bank concentration and trade credit is significant at 10% for individual test but insignificant for accumulative test; and the coefficient of interaction term between bank concentration and growth is inconsistent and weakly significant at 10% only for accumulative test. Eventually, our results show that bank concentration remarkably affects the importance of firm's demand determinants to its leverage taking decision. The economy is indicated as credit supply oriented when large banks are leading the market. Tangible assets and firm size become less important while profitability become more favorable in determining leverage.

3. Additional test for direct effects

Figure 2 in Literature review shows an upward slope of world and advanced economies' bank concentration while Asian developing countries shows an opposite downward slope of bank concentration overtime. Empirical studies find both negative and positive coefficients for the relationship between bank concentration and long term debt. Therefore, we assume that coefficient of bank concentration to firm leverage might be revertible at a given point and we are going to test this assumption in our sample. Because our sample mean of bank concentration approximately equals to sample median (i.e. 0.53) and closes to the convertible point reaches in 2013 for both world average and Asian developing countries, we decided to create a dummy variable dBC, by which dBC equals to 0 if $BC5 \geq 0.53$ and dBC equals to 1 if $BC5 < 0.53$. We conduct the first additional test on how dummy variable dBC affects coefficient of bank concentration on BDR to check for the revertible coefficient assumption of bank concentration on leverage.

Secondly, due to the estimated equation of Bank concentration is strongly correlated to the number of banks. An increase in number of bank in the economy simply refers to a decrease of bank concentration. Therefore, a positive relationship between number of bank and firm leverage might indicate negative correlation between bank concentration and firm leverage that we have found in previous tests. We conduct the second additional test by replacing Number of bank for bank concentration on our empirical test. And finally, as mentioned in section II, another variable which is suggested to have a strong effect on firm

choice of debt is creditor rights. We conduct the last additional test by adding creditor rights as an extra variable in our empirical test. Column (1) shows our previous results while column (2) to column (4) in table 7 below respectively present results of our first, second and third additional test.

Table 7: Additional Tests

	(1)	(2)	(3)	(4)
LBDR	0.721*** (0.0148)	0.717*** (0.0149)	0.717*** (0.0149)	0.715*** (0.0149)
PPE	0.0628*** (0.00398)	0.0636*** (0.00399)	0.0635*** (0.00400)	0.0639*** (0.00402)
GROWTH	0.00806*** (0.000816)	0.00809*** (0.000815)	0.00809*** (0.000815)	0.00813*** (0.000815)
SIZE	0.281*** (0.0910)	0.274*** (0.0897)	0.273*** (0.0895)	0.285*** (0.0949)
TRACREDIT	-0.0594*** (0.00442)	-0.0604*** (0.00444)	-0.0604*** (0.00444)	-0.0608*** (0.00447)
PROFIT	-0.0988*** (0.00544)	-0.100*** (0.00548)	-0.1000*** (0.00548)	-0.101*** (0.00550)
BC5	-0.0214* (0.0110)			-0.0591*** (0.0156)
LENCAP	0.0290*** (0.00552)	0.0112* (0.00600)	0.0112* (0.00600)	0.0126** (0.00628)
BROA	0.127** (0.0496)	0.103** (0.0479)	0.105** (0.0480)	0.0956** (0.0481)
FINFREE	0.0271** (0.0108)	0.0301*** (0.00969)	0.0259*** (0.00987)	0.0317*** (0.0108)
PRORIGHT	-0.0431*** (0.0113)	-0.0281** (0.0116)	-0.0399*** (0.0118)	-0.0380*** (0.0118)
Number_Bank		0.0190*** (0.00290)	0.0154*** (0.00324)	
CRERIGHT			-0.0391* (0.0210)	
dBC				-0.104*** (0.0156)
c.dBC#c.BC5				0.210*** (0.0294)
dLENCAP				
Observations	62,480	62,480	62,480	62,480
Number of ID	7,118	7,118	7,118	7,118
Country FE	YES	YES	YES	YES
Time FE	YES	YES	YES	YES
Robust cluster	Yes	Yes	Yes	Yes

Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1. Number_Bank presents the number of bank in year t; CRERIGHT presents creditor rights yearly. dBC: dummy variable, equals to 0 if BC5>=0.53 and equals to 1 if BC5<0.53. To save place we do not provide notation of other variables. Please look at table 2 for details.

The result suggests that firm leverage increases when number of bank increases, or in other words, firm leverage increases when bank concentration decreases. This test

confirms the consistence of our previous direct empirical result of bank concentration on corporate leverage. For second test, we find the same trend with Cho et al. (2014) when our result implies that weak proxy of creditor rights is associated with high corporate leverage. We find that adding creditor right unchanged the sign and significant level of our main variables in previous tests. Finally, the result in table 7 shows a statistically significant effect of dBC on bank concentration. Coefficient of BC5 is revertible when it receives negative value if BC5 is greater than sample median and positive value if BC5 is small than sample median. Therefore, we suggest that to best satisfy capital demand of firms, banking system needs to flexibly adjust its concentration. If banking market structure is too concentrated, the market might need to deconcentrate to increase leverage for firms and vice versa.

V. Conclusions

In this paper, we focus on direct and indirect impacts of bank concentration and market factors on corporate leverage. Our sample contains 12 Asian developing countries from 2000 to 2013. We use GMM two step estimation to fix for autoregressive problem of dynamic model and for existence of unobserved time invariant effects in our model.

“General principles” for direct impact of firm’s characteristics are confirmed when we find positive relationships between tangible assets, growth and firm size with leverage. We also find that profitable firms prefer to use internal funds and trade credit rather than borrowing debt from financial system. For supply direct impact, our study shows a negative relationship between bank concentration and corporate leverage. Our sample suggests that, in general, Asian developing countries have increased the number of banks to satisfy capital demand for enterprise customers. Strong proxy of property rights directly decreases firm leverage, while high degree of financial freedom, in contrast, directly increase firm’s accessibility to bank loans.

For indirect impact of supply and market factors on firm leverage, our results suggest that profitable firms are more attractive while large firms or firms with high tangible assets becomes less important in the economies with high bank concentration structure. Strong property rights indirectly affect long-term debts of firm when it increases the positive sign of bank concentration and encourages profitable firms use internal funds to support for their capital need. In contrast, financial freedom reduces the importance of tangible assets and opens more chances for profitable firms to facilitate access to debt. In addition, high degree of financial freedom diminishes dependence of firms on their operating suppliers.

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