

# Bank Leverage and Asset Positions: Cross-Country Evidence

Diny Ghuzini

College of Arts and Sciences Western Michigan University



## Motivation

Following the global crisis 2007-2009, studies have tried to link firm's capital structure and the business cycle. Adrian and Shin (2010) found that banks react differently from household and non-financial entities to a change in asset price. When the economy is expanding assets and equity positions both increase which result in less leverage (leverage is defined as the ratio of assets to equity). The mechanism also works in reverse, a downturn in economic activity reduces asset prices, decreasing equity. But households usually cannot cut debt as fast as asset price decline. Thus, growth in leverage and asset prices are negatively correlated. This relationship might be different for banks and non-financial firms. As asset price increases, asset and equity will also increase, but banks and non-financial firms can use this larger equity to expand their lending. The additional lending leads to higher asset level. Therefore, the relationship between the growth in leverage and asset prices is positive. As such, banks will withdraw credits to avoid risks when the economy is under stress. This means leverage is pro-cyclical and banks exacerbate the economic cycle. Using U.S. investment bank data, Adrian and Shin (2010) found that bank's leverage is pro-cyclical.

D'Hulster (2009) defines leverage as follows:

"Leverage allows a financial institution to increase the potential gains or losses on a position or investment beyond what would be possible through a direct investment of its own funds."

There are various ways to measure leverage, this study defines leverage as the ratio of assets to equity. A central feature of leveraging is it is associated with risks because now bank/firm have more liability and less equity. The leveraging up of banks plays a role in accentuating the business cycle. This study seeks to determine whether bank leveraging behavior is pro-cyclical throughout the world.

## Data and Descriptive Statistics

The banking data that is used for this paper are drawn from Orbis database published by Bureau van Dijk (BvD). The database is usually used by studies that require investigation using firm-level financial and non-financial data. It covers both listed and unlisted companies around the world. The database contains information on financial data, ownerships, stock data, and location (<http://www.bvdinfo.com>).

There are 10 years of annual data and 3 years of quarterly data available from the database. The annual data is available from 2003-2012. The quarterly data is available from 2010-2012. All types of banks except central bank are included in the analysis, there are 24,960 banks from 207 countries.

Table.1 Descriptive Statistics

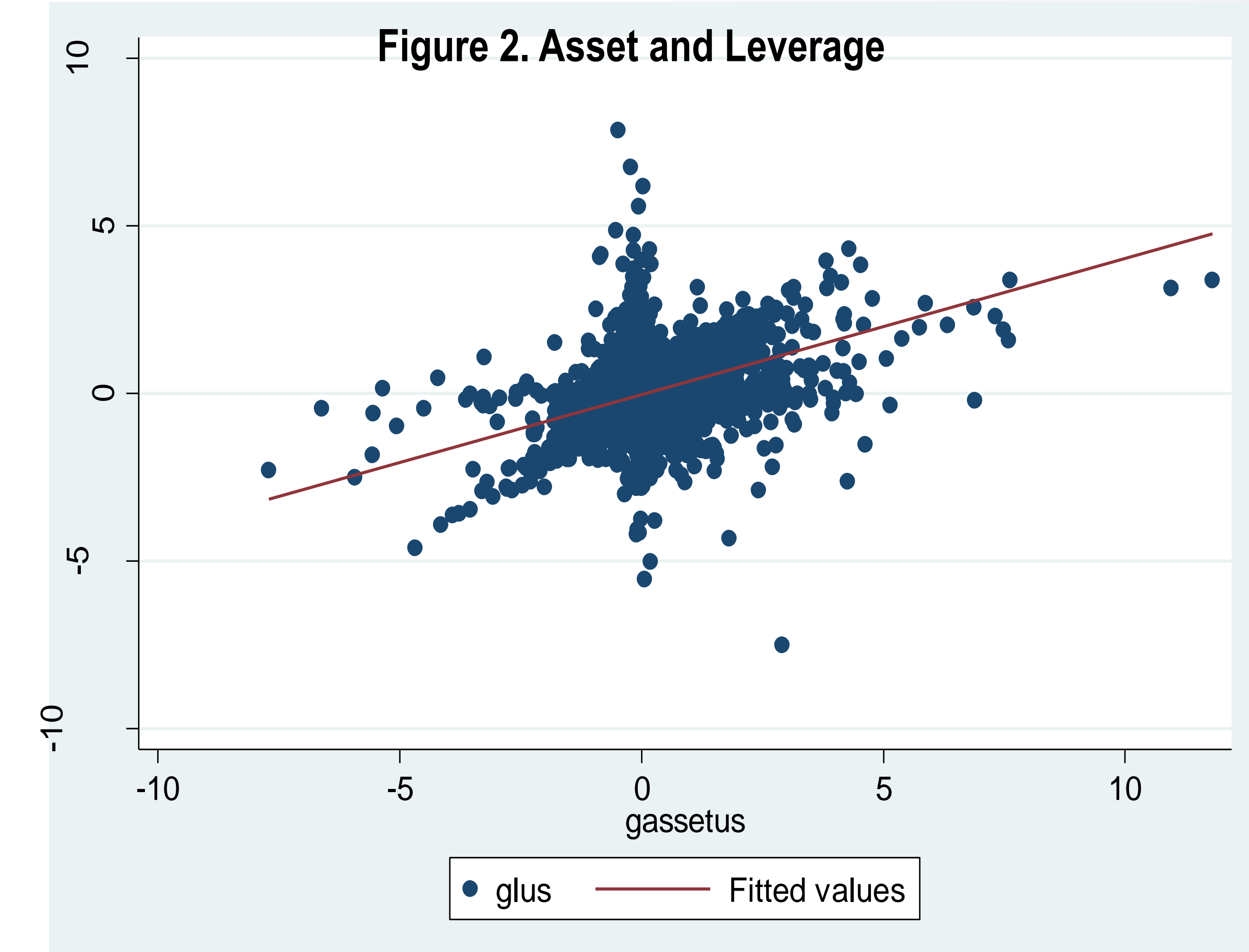
Variable	Observations	Mean	Std. Dev.
Total Asset 2011 (th USD)	15,061	10,200,000	90,700,000
Total Asset 2003 (th USD)	15,956	4,561,426	38,500,000
Equity 2011 (th USD)	15,060	647,720	5,250,315
Equity 2003 (th USD)	15,947	257,970	2,084,533
Leverage 2011 (asset/equity)	15,059	10.54	147.95
Leverage 2003 (asset/equity)	15,944	18.47	510.85

Source: Orbis

We can see from the standard deviation that variation in assets, equity, and leverage are relatively high. Winsorization was employed to account for outliers in the data. The aggregated data are displayed in Figure 1.

## Results

The raw data suggest that leverage growth is pro-cyclical as shown in Figure 2. The vertical axis corresponds to the asset growth and the horizontal axis corresponds to the leverage growth. Asset and leverage growth move together.



To further examine the relationship between growth in leverage and assets, fixed effect regression using annual panel data is used. The results are presented in Table 2. The second column includes country dummies as an explanatory variable.

Table 2. Regression Results

Dependent variable: leverage growth	(1)	(2)
log of leverage (-1)	-0.202*	-0.060*
	(0.007)	(0.002)
assets growth	0.315*	0.348*
	(0.015)	(0.012)
constant	0.445*	0.065
	(0.017)	(0.055)
Country fixed effect	No	Yes
R <sup>2</sup>	0.15	0.15
Observations	106,182	106,182

\* The coefficient is significant at 1% level

Both specifications produce similar asset growth coefficients. Asset growth positively affects leverage growth. These results suggest that Adrian and Shin's (2010) results for the U.S. investment banks can be generalized to all types of banks throughout the world. Bank behavior is pro-cyclical exacerbating the business cycle.

Figure 1. Average Annual Assets, Equity, and Leverage

