Discussion on "Collateral Value and Financial Constraint: Analysis Using Corporate Data after the Tohoku Earthquake" by Hirofumi Uchida, Daisuke Miyakawa, Iichiro Uesugi, Arito Ono and Kaoru Hosono

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Major Contributions of the Paper

- Collateral channel VS. lending channel

<u>Collateral channel</u>

✓ A borrower suffering from losses on its collateralizable assets faces a decrease in debt capacity and becomes credit constrained.

<u>Lending channel</u>

✓ A bank suffering from decreasing values of assets pledged by its borrowers is constrained to providing new loans.

Major Contributions of the Paper

- By using losses on assets incurred by a firm due to the Tohoku Earthquake as measures for exogenous variations in the collateral value of a firm, the authors are successful at identifying between collateral and lending channels.

Summary of the Paper: Data

- They use the <u>firm level data</u> rather than the local level data.
- ✓ The Survey on Firms Rehabilitating from the Earthquake conducted by the Research Center for the Rehabilitation from the Earthquake, Graduate School of Economics, Tohoku University.

Summary of the Paper: Methodology

A dependent variable

- The Popov and Udell (2012) type binary dependent variable probit estimation.
- The binary dependent variable, Loan_accept, which is equivalent to 1 – a dummy variable for being credit constrained:
- ✓A firm is credit constrained when a firm was either rejected a loan application or discouraged to apply a loan for a fear of being rejected.

Summary of the Paper: Methodology

Major independent variables
- Land_value_loss: (subjective) evaluation losses on lands held by a firm
- Nonland_value_loss: total amount necessary for a firm to fully repurchase or repair the damaged tangible fixed assets excluding lands

Summary of the Paper: Methodology

<u>Selection of the Sample</u>
- Dropping firms that answered that they did not need to borrow a (new) loan.
- This way, the authors focus on the sample of firms that need to borrow a loan.

<u>Control variables</u>
- Dummy variables for bank damage, debt reduction, loan purchase, supplier damage, financial supports, business condition, leverage, single bank relationship, damaged area,
- Size as measured by (logarithm of) equity

Summary of the Paper: Major Findings

- Both Land_value_loss and Nonland_value_loss are negatively associated with the probability of loan acceptance, suggesting that **losses on assets due to the Tohoku earthquake lead to the credit constraint**.
- The effect of **Land_value_loss** is **far greater** than that of Nonland_value_loss.
- The results are robust to use of loan acceptance by a firm's main bank or loan acceptance by a firm's non main banks when constructing a dependent variable.
- The effects of Land_value_loss/Nonland_value_loss are more pronounced for highly leveraged firms than less highly leveraged firms.

Major Comments
Is Land_value_loss Really Exogenous?

- **The result that the effect of losses on lands on credit constraint is larger than that of damages on non-land tangible assets is puzzling**.

✓ This is even more puzzling because, in the earthquake affected area, the land prices are very cheap and structures rather than lands provide a firm with most of collateralizable value.

The Structure Price VS The Land Price

	Miyagi	Iwate	Fukushima
Evaluated price of the structure per square meter (10,000 yen) [†]	16	16	16
	Wakabayashi ward	Miyako City	Iwaki City
Average land price per square meter (10,000 yen) [††]	13.9	5.6	5.5

Sources: Ministry of Land, Infrastructure, Transport and Tourism, http://hoken.kakaku.com/insurance/kasai/select/hyoukagaku/
[†] The evaluation for the structure of grade 3 that can be used as both residential housing and a shop.
[††] The average price of lands in commercial areas as surveyed under the public land price notice system or prefecture land price survey in 2011 through 2014.

Major Comments
Is Land_value_loss Really Exogenous?

- Kiyotaki and Moore (1997) discuss that **the equilibrium land price is the discounted value of marginal product of land**.
- Then, the following amplification mechanism may exist.

lower land price → lower collateral value → credit constraint → less investment → lower productivity of land → lower land price → …

- The larger effect of Land_value_loss may reflect this amplification mechanism...

Major Comments
Is Land_value_loss Really Exogenous?

- What is the "evaluation loss on land"?
- ✓The <u>tax code</u> allows a firm to record the evaluation loss on a book only when the land is severely damaged by disasters.
- ✓One might interpret the evaluation loss literally as a decrease in the mark to market price of land.
- If respondents interpret in a former way, Land_value_loss is likely exogenous.
- If they interpret in a latter way, Land_value_loss may be endogenous. A large number of zeros for this value may indicate many of them interpreted in the former way?

The Damages to Lands?

- Why Not Asking Damages to Lands in Parallel with Nonland_value_loss? They are not only exogenous but also less susceptible to response errors.

Category of Damage	
Damages such as cracks on the grounds	In case of damages such as cracks on the grounds, one can designate the 80% of an estimated amount of the cost to restore the pre earthquake state as the value of damaged lands.
Damages such as submergence due to tsunami	When lands are submerged under water, one can designate the total value of lands as the value of damaged lands.

The (rough) translation from the webpage of the National Tax Agency (https://www.nta.go.jp/sonota/sonota/osirase/data/h23/jishin/tokurei/sozou_03/index.htm)

Major Comments
Is Land_value_loss Really Exogenous?

- An alternative view
- ✓ It may be the case that banks in the earthquake affected area do not take structures as collateral or discount the value of structures substantially relative to that of lands.

Minor Comments: Bank damage

- The more appropriate variable to measure damages to banks would be the local level variable to measure bank damage such as the share of damaged branches in a firm's locality when the credit constraint is measured by a firm being constrained to borrowing from any bank.
- Likewise, the appropriate variable would be the damage to the largest lender when the credit constraint is measured by a firm being constrained to borrowing from the largest lender, etc.

Other Minor Comments

- Over what period evaluation losses on lands were measured? (Mar. 2011 – Jul. 2012?)
- Over what period loan acceptance was measured? (Mar. 2011 – Jul. 2012?)
- Ideally, when examining the loan acceptance by the largest lender, one had better collect the data about a firm's application of a loan to the largest lender (a firm being discouraged from applying for a loan to the largest lender), but, apparently, the survey does not collect such information.

Reference

Popov, Alexander and Gregory F. Udell (2012), "Cross-Border Banking, Credit Access, and the Financial Crisis," *Journal of Financial Intermediation*, 87(1): 147-161.