A Theory of Eligibility

by Matthias Kaldorf and Florian Wicking

Discussion by Victoria Vanasco CREi, UPF, BSE, CEPR

Fourth Conference on Financial Stability Banco de España and CEMFI June 30th

This paper studies the implications of having eligibility criteria for corporate assets to act as collateral (e.g. to be accepted by the Eurosystem).

- This paper studies the implications of having eligibility criteria for corporate assets to act as collateral (e.g. to be accepted by the Eurosystem).
- Main idea: eligibility criteria induce a discontinuous change in valuations of corporate securities, and such discontinuity can induce distortions.

- This paper studies the implications of having eligibility criteria for corporate assets to act as collateral (e.g. to be accepted by the Eurosystem).
- Main idea: eligibility criteria induce a discontinuous change in valuations of corporate securities, and such discontinuity can induce distortions.
- Main questions:

- This paper studies the implications of having eligibility criteria for corporate assets to act as collateral (e.g. to be accepted by the Eurosystem).
- Main idea: eligibility criteria induce a discontinuous change in valuations of corporate securities, and such discontinuity can induce distortions.
- Main questions:
 - 1. How are firm financing choices distorted by collateral-eligibility criteria?

- This paper studies the implications of having eligibility criteria for corporate assets to act as collateral (e.g. to be accepted by the Eurosystem).
- Main idea: eligibility criteria induce a discontinuous change in valuations of corporate securities, and such discontinuity can induce distortions.
- Main questions:
 - 1. How are firm financing choices distorted by collateral-eligibility criteria?
 - 2. Are such distorsions quantitatively important?

- This paper studies the implications of having eligibility criteria for corporate assets to act as collateral (e.g. to be accepted by the Eurosystem).
- Main idea: eligibility criteria induce a discontinuous change in valuations of corporate securities, and such discontinuity can induce distortions.
- Main questions:
 - 1. How are firm financing choices distorted by collateral-eligibility criteria?
 - 2. Are such distorsions quantitatively important?
 - 3. Given this, how should eligibility criteria be set?

1. How are firm choices distorted by collateral-eligibility criteria? A model of endogenous collateral supply (i.e. firm debt choices)

▶ Continuum of firms with heterogenous revenue processes, indexed by *s*.

- 1. How are firm choices distorted by collateral-eligibility criteria? A model of endogenous collateral supply (i.e. firm debt choices)
 - ▶ Continuum of firms with heterogenous revenue processes, indexed by *s*.
 - lssue debt b(s) at price q(b|s) to patient, risk-neutral, competitive, banks.

- 1. How are firm choices distorted by collateral-eligibility criteria? A model of endogenous collateral supply (i.e. firm debt choices)
 - ▶ Continuum of firms with heterogenous revenue processes, indexed by *s*.
 - lssue debt b(s) at price q(b|s) to patient, risk-neutral, competitive, banks.
 - Firms default when per period revenue cannot service debt b in full.

- 1. How are firm choices distorted by collateral-eligibility criteria? A model of endogenous collateral supply (i.e. firm debt choices)
 - ▶ Continuum of firms with heterogenous revenue processes, indexed by *s*.
 - lssue debt b(s) at price q(b|s) to patient, risk-neutral, competitive, banks.
 - Firms default when per period revenue cannot service debt b in full.
 - Probability of default of firm s with debt b is F(b|s).

- 1. How are firm choices distorted by collateral-eligibility criteria? A model of endogenous collateral supply (i.e. firm debt choices)
 - ▶ Continuum of firms with heterogenous revenue processes, indexed by *s*.
 - lssue debt b(s) at price q(b|s) to patient, risk-neutral, competitive, banks.
 - Firms default when per period revenue cannot service debt b in full.
 - Probability of default of firm s with debt b is F(b|s).
 - Eligible collateral: If $F(b|s) \leq \overline{F}$, debt b is eligible and carries premium L:

$$q(b|s) = (1 - F(b|s)) \cdot (1 + \Psi(b|s) \cdot L), \tag{1}$$

where $\Psi(b|s) = 1$ if eligible, and zero otherwise.

- 1. How are firm choices distorted by collateral-eligibility criteria? A model of endogenous collateral supply (i.e. firm debt choices)
 - ▶ Continuum of firms with heterogenous revenue processes, indexed by *s*.
 - lssue debt b(s) at price q(b|s) to patient, risk-neutral, competitive, banks.
 - Firms default when per period revenue cannot service debt b in full.
 - Probability of default of firm s with debt b is F(b|s).
 - Eligible collateral: If $F(b|s) \leq \overline{F}$, debt b is eligible and carries premium L:

$$q(b|s) = (1 - F(b|s)) \cdot (1 + \Psi(b|s) \cdot L), \tag{1}$$

where $\Psi(b|s) = 1$ if eligible, and zero otherwise.

- 1. How are firm choices distorted by collateral-eligibility criteria? A model of endogenous collateral supply (i.e. firm debt choices)
 - ▶ Continuum of firms with heterogenous revenue processes, indexed by *s*.
 - lssue debt b(s) at price q(b|s) to patient, risk-neutral, competitive, banks.
 - Firms default when per period revenue cannot service debt b in full.
 - Probability of default of firm s with debt b is F(b|s).
 - Eligible collateral: If $F(b|s) \leq \overline{F}$, debt b is eligible and carries premium L:

$$q(b|s) = (1 - F(b|s)) \cdot (1 + \Psi(b|s) \cdot L), \tag{1}$$

where $\Psi(b|s) = 1$ if eligible, and zero otherwise.

Question: does it make sense to scale the premium by the default probability?

Let $V(b|s) = q(b|s) \cdot b + \beta \cdot E[y - b|y \ge b]$, we have three cases:

Let $V(b|s) = q(b|s) \cdot b + \beta \cdot E[y - b|y \ge b]$, we have three cases:



1. Eligible and constrained: b^* increases when eligibility criteria is relaxed.

Let $V(b|s) = q(b|s) \cdot b + \beta \cdot E[y - b|y \ge b]$, we have three cases:



- 1. Eligible and constrained: b^* increases when eligibility criteria is relaxed.
- 2. Eligible and unconstrained: b^* does not vary when eligibility is relaxed.

Let $V(b|s) = q(b|s) \cdot b + \beta \cdot E[y - b|y \ge b]$, we have three cases:



- 1. Eligible and constrained: b^* increases when eligibility criteria is relaxed.
- 2. Eligible and unconstrained: b^* does not vary when eligibility is relaxed.
- 3. Non-eligible: b^* can **decrease** when eligibility is relaxed.

2. Are such distorsions qualitatively important?

Take the model to the data

- \blacktriangleright When elibility criteria is relaxed, i.e. \bar{F} increases, then
 - Some firms may increase debt supply: risk-taking incentive (group 1).
 - Some firms may decrease their debt supply: disciplining incentive (group 3).

2. Are such distorsions qualitatively important?

Take the model to the data

- ▶ When elibility criteria is relaxed, i.e. \bar{F} increases, then
 - Some firms may increase debt supply: risk-taking incentive (group 1).
 - Some firms may decrease their debt supply: disciplining incentive (group 3).
- Then what is the overall effect of collateral eligibility?
 - More collateral: some eligible firms issue more + new debts become eligible.
 - Risk: the answer is quantitative, as it varies with distribution of firms.
 - Extended model applied to the ECB Collateral Easing Policy.

2. Are such distorsions qualitatively important?

Take the model to the data

- ▶ When elibility criteria is relaxed, i.e. \bar{F} increases, then
 - Some firms may increase debt supply: risk-taking incentive (group 1).
 - Some firms may decrease their debt supply: disciplining incentive (group 3).
- Then what is the overall effect of collateral eligibility?
 - More collateral: some eligible firms issue more + new debts become eligible.
 - Risk: the answer is quantitative, as it varies with distribution of firms.
 - Extended model applied to the ECB Collateral Easing Policy.
- Main findings: when collateral eligibility criteria is relaxed ...
 - the mechanical increase in value of collateral > actual increase, and
 - default risk increases.
 - \Rightarrow Firm responses dampen the effect of increasing eligibility.

 \blacktriangleright The response of firms to the collateral premium L is straightforward.

• Any jump in the price q will induce some firms to bunch their debt levels.

• The response of firms to the collateral premium L is straightforward.

- Any jump in the price q will induce some firms to bunch their debt levels.
- Eligibility is a necessary but not sufficient condition to be good collateral.
 - May be useful to think more about how L may vary with b and s.

- ▶ The response of firms to the collateral premium *L* is straightforward.
 - Any jump in the price q will induce some firms to bunch their debt levels.
- Eligibility is a necessary but not sufficient condition to be good collateral.
 - May be useful to think more about how L may vary with b and s.
- I struggle to grasp the mechanism behing the dampening effect: the stock of collateral should increase:
 - eligible firms issue (weakly) more debt,
 - some non-eligible firms become eligible.

- The response of firms to the collateral premium L is straightforward.
 - Any jump in the price q will induce some firms to bunch their debt levels.
- Eligibility is a necessary but not sufficient condition to be good collateral.
 - May be useful to think more about how L may vary with b and s.
- I struggle to grasp the mechanism behing the dampening effect: the stock of collateral should increase:
 - eligible firms issue (weakly) more debt,
 - some non-eligible firms become eligible.
- Is it that firm responses reduce the value of collateral? Is that important?

- ▶ The response of firms to the collateral premium *L* is straightforward.
 - Any jump in the price q will induce some firms to bunch their debt levels.
- Eligibility is a necessary but not sufficient condition to be good collateral.
 - May be useful to think more about how L may vary with b and s.
- I struggle to grasp the mechanism behing the dampening effect: the stock of collateral should increase:
 - eligible firms issue (weakly) more debt,
 - some non-eligible firms become eligible.
- Is it that firm responses reduce the value of collateral? Is that important?
- ▶ That default increases is natural as ~ risk-premia for some assets falls.

- upper bound on default probability,
- upper bound on debt levels.

- upper bound on default probability,
- upper bound on debt levels.
- They show that the combination can implement a given amount of collateral with lower default risks.

- upper bound on default probability,
- upper bound on debt levels.
- They show that the combination can implement a given amount of collateral with lower default risks.
- The eligibility criteria directly controls default probabilities, could you explain better why an additional limit on debt levels is needed?
 - From my reading, you want to limit b to reduce default probabilities, but you restrict those directly ...

- upper bound on default probability,
- upper bound on debt levels.
- They show that the combination can implement a given amount of collateral with lower default risks.
- The eligibility criteria directly controls default probabilities, could you explain better why an additional limit on debt levels is needed?
 - From my reading, you want to limit b to reduce default probabilities, but you restrict those directly ...
- Some of the confusion I think is due to the fact that eligibility is about current default probabilities, and not future ones ... is this reasonable?

What is the effect of having collateral eligibility criteria for corporate debt?

- What is the effect of having collateral eligibility criteria for corporate debt?
- ▶ This is a very important question: eligibility criteria affect ...

What is the effect of having collateral eligibility criteria for corporate debt?

- ► This is a very important question: eligibility criteria affect ...
 - 1. amount of collateral, and thus functioning of the financial system,

What is the effect of having collateral eligibility criteria for corporate debt?

- This is a very important question: eligibility criteria affect ...
 - 1. amount of collateral, and thus functioning of the financial system,
 - 2. borrowing of firms, and thus investment and default risk.

- What is the effect of having collateral eligibility criteria for corporate debt?
- This is a very important question: eligibility criteria affect ...
 - 1. amount of collateral, and thus functioning of the financial system,
 - 2. borrowing of firms, and thus investment and default risk.
- They find that firm responses are quantitatively relevant and substantially dampen the impact of relaxing eligibility criteria.

- What is the effect of having collateral eligibility criteria for corporate debt?
- This is a very important question: eligibility criteria affect ...
 - 1. amount of collateral, and thus functioning of the financial system,
 - 2. borrowing of firms, and thus investment and default risk.
- They find that firm responses are quantitatively relevant and substantially dampen the impact of relaxing eligibility criteria.
- ▶ More intuition or formal results on the dampening effect would be useful.

- What is the effect of having collateral eligibility criteria for corporate debt?
- This is a very important question: eligibility criteria affect ...
 - 1. amount of collateral, and thus functioning of the financial system,
 - 2. borrowing of firms, and thus investment and default risk.
- They find that firm responses are quantitatively relevant and substantially dampen the impact of relaxing eligibility criteria.
- ▶ More intuition or formal results on the dampening effect would be useful.
- More work on modeling approach needed to have a Theory of Eligibility :)