Collateral Registries for Movable Assets: Does their Introduction Spur Firms’ Access to Finance?

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Outline

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1. Motivation

- To reduce asymmetric information problems and increase loan repayment, banks typically require collateral from their borrowers.
  - According to Enterprise Surveys performed in over 100 countries, collateral was required in over 75% of all loans.

- Movable assets are the main type of collateral that firms, especially those in developing countries, could pledge to obtain financing.
  - In developing countries, 78% of the capital stock of businesses is typically in movable assets such as machinery, equipment or receivables, and only 22% in immovable property (Alvarez de la Campa, 2011).

- However, lenders in developing countries are usually reluctant to accept movable assets as collateral due to the inadequate legal and regulatory environment in which banks and firms co-exist.

- In this context, movable assets become “dead capital” (Fleisig et al, 2006).
1. Motivation

- A sound legal and regulatory framework is essential to allow movable assets to be used as collateral.

- The movable collateral registry fulfills two essential functions:
  1. To notify parties about the existence of a security interest in movable property.
  2. To establish the priority of creditors vis-a-vis third parties.

- Without a well-functioning registry for movable assets, even the best secured transactions laws could be completely ineffective and useless.

- Given the importance of movable collateral registries, 18 countries have established such registries in the past decade.

- However, to our knowledge, there is no systematic and rigorous empirical evidence on whether such reforms have improved firms’ access to finance.
2. Summary of the paper

This paper explores the impact of introducing collateral registries for movable assets on firms' access to finance, using firm-level surveys for 73 countries.

Following a difference-in-difference approach, we compare access to finance pre and post the introduction of movable collateral registries in 7 countries (i.e., the reform or treatment sample) against three different “control” groups:

1) firms in all countries that did not implement collateral reforms
2) firms in a sample of countries matched by location and income per capita to the countries that introduced movable collateral registries
3) firms in countries that introduced other types of collateral reforms but did not set up registries for movable collateral
2. Summary of the paper

Baseline estimations indicate that the introduction of registries for movable assets is associated with:

- An increase in the likelihood that a firm has a loan, line of credit or overdraft,
- A rise in the share of firm working capital and fixed assets financed by banks,
- A reduction in the interest rates paid on loans,
- An increase in the maturity of bank loans.

There is also some evidence that the impact of the introduction of movable registries on firms’ access to finance is larger among smaller firms, who also report a reduction in subjective, perception-based measure of finance obstacles.
3. Caveats and limitations

- Sample of reform countries is small.

- We treat all registry reforms equally.
  - We cannot shed light on what is the best way to set up a registry. For more on this see Fleisig et al (2006) and Alvarez de la Campa (2011).
4. Related literature

- Large literature that investigates whether collateral reduces credit rationing and increases access following the seminal paper of Stiglitz and Weiss (1981).
  - Literature based on developed countries (Steijvers and Voordeckers, 2009 offer a review).
- Liberti and Mian (2010) is one of the few related papers that uses non-US data and explores how financial development in a country affects the collateral cost of capital in 15 countries.
  - They find that cost of collateral declines with improved financial development. More relevant for our study, they also find that in more financially developed countries firms can use more “firm-specific” assets, i.e. movable assets.
- Nguyen and Qian (2012) investigate the prevalence and determinants of the use of collateral in 43 countries.
  - They find that in countries with better institutions, firms are less likely to pledge collateral.
- Our paper also relates to a broader literature that investigates the importance of the legal system for the availability and costs of finance.
5. Data

- We use two primary datasets: the *Doing Business* and the *Enterprise Surveys* datasets (as suggested in Fleisig et al., 2006).

- The *Doing Business* dataset:
  - Contains annual measures of business regulations for firms in 185 economies.
  - Allows us to identify the countries and years when movable collateral registries were introduced.

- The *Enterprise Survey* dataset provides firm-level data on access to finance and other firm characteristics. In particular, the survey:
  - Asks firms if they have a loan, line of credit or overdraft.
  - Identifies firms that currently have a loan from a financial institution.
  - Requires firms to report the share of working capital and, separately of fixed assets financed by banks.
  - For firms that have a loan, the dataset includes information on the interest rate and maturity of the most recent loan.
  - Requires firms to rate the severity of access to finance as an obstacle for their operations and growth.
  - Includes information on other firm characteristics such as size, ownership, exporter status, and sector, which we include as control variables in our estimations.
5. Data

- We only consider countries with at least two Enterprise Surveys since 2002 so that we can control for country time-invariant effects.

- Our final sample includes 73 countries.
  - 7 countries that implemented other types of collateral reforms without registry reform: Armenia, Georgia, Mauritius, Poland, Romania, and Vietnam.
  - 7 countries matched to the registry reform countries based on their region and their per capita GDP: Macedonia, Czech Republic, Ecuador, El Salvador, Belarus, Burkina Faso, and Azerbaijan.
Access and registry reform: A look at the data

Graphs showing data for Bosnia Herzegovina and Croatia (Treatment) from 2000 to 2010.
Access and registry reform: A look at the data

- Rwanda
- Serbia and Montenegro
- Ukraine
Access and registry reform: A look at the data

[Graph showing access and registry reform in Guatemala and Peru from 2000 to 2012]
Access and registry reform: A look at the data

![Graph showing access and registry reform results](image)
6. Empirical methodology

Access Indicator_{i,j,t} = \beta_1 \text{Registry reform}_{j,t} + \beta_2 X_{i,j,t} + \beta_3 Z_{j,t} + \alpha_j + \gamma_t + \epsilon_{i,j,t}

Access Indicator refers to seven different measures of firms’ access to credit:
1) Access to Finance takes the value of 1 if the firm has a line of credit, loan or overdraft;
2) Access to Loans is a dummy that captures whether the firm has an outstanding loan;
3) Financing Obstacle takes the value of 1 if the firm considers access to finance a major or severe obstacle to its operations and growth;
4) Working Capital Financed by Banks is the % of the firm’s working capital that is financed by banks;
5) Fixed Assets Financed by Banks is the share of the firm’s fixed assets financed by banks;
6) Interest Rate refers to the interest rate paid by the firm on the most recent loan;
7) Maturity is the maturity (in months) for most recent loan by the firm.

Registry reform: 1 for countries that introduced registry reform for years after reform
X: firm-level characteristics (firm size, ownership type, exporter status, sector)
Z: country-level variables (inflation rate, the GDP growth rate, private credit to GDP)
\alpha_j and \gamma_t represent country and year fixed effects, respectively
6. Empirical methodology

- We conduct different estimations varying the sample of countries included in the regressions as control group:
  1. All non-reform countries.
  2. Matched sample obtained by pairing each reform country with a country in the same region with a similar level of per capita income.
  3. Countries that conducted other collateral law reforms.

- To allow for a heterogeneous impact of registry reform across firms we repeat our baseline estimation interacting the Registry Reform dummy with firm size dummies.
### 7. Results

**Baseline estimations (reformers vs. non-reformers)**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Access to finance</th>
<th>Access to loans</th>
<th>Financial obstacle</th>
<th>Working capital financed by banks</th>
<th>Fixed assets financed by banks</th>
<th>Interest rate</th>
<th>Maturity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registry reform</td>
<td>0.086***</td>
<td>0.072**</td>
<td>-0.016</td>
<td>0.105*</td>
<td>0.200***</td>
<td>-0.029*</td>
<td>6.199**</td>
</tr>
<tr>
<td></td>
<td>[0.028]</td>
<td>[0.028]</td>
<td>[0.039]</td>
<td>[0.056]</td>
<td>[0.073]</td>
<td>[0.016]</td>
<td>[2.880]</td>
</tr>
<tr>
<td>Log firm size</td>
<td>0.085***</td>
<td>0.084***</td>
<td>-0.019***</td>
<td>0.104***</td>
<td>0.159***</td>
<td>-0.003***</td>
<td>0.641**</td>
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<tr>
<td></td>
<td>[0.004]</td>
<td>[0.003]</td>
<td>[0.003]</td>
<td>[0.005]</td>
<td>[0.011]</td>
<td>[0.001]</td>
<td>[0.247]</td>
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<tr>
<td>Manufacturing</td>
<td>0.06</td>
<td>0.015**</td>
<td>0.066***</td>
<td>0.018</td>
<td>0.091***</td>
<td>-0.000</td>
<td>0.216</td>
</tr>
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<td></td>
<td>[0.009]</td>
<td>[0.008]</td>
<td>[0.007]</td>
<td>[0.013]</td>
<td>[0.024]</td>
<td>[0.002]</td>
<td>[0.821]</td>
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<tr>
<td>Exporter</td>
<td>0.045***</td>
<td>0.049***</td>
<td>0.008</td>
<td>0.084***</td>
<td>0.047**</td>
<td>-0.004***</td>
<td>-0.163</td>
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<td>[0.008]</td>
<td>[0.007]</td>
<td>[0.007]</td>
<td>[0.013]</td>
<td>[0.021]</td>
<td>[0.001]</td>
<td>[0.732]</td>
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<tr>
<td>Foreign owned</td>
<td>-0.055***</td>
<td>-0.111***</td>
<td>-0.100***</td>
<td>-0.159***</td>
<td>-0.351***</td>
<td>-0.010***</td>
<td>-1.471</td>
</tr>
<tr>
<td></td>
<td>[0.010]</td>
<td>[0.010]</td>
<td>[0.008]</td>
<td>[0.018]</td>
<td>[0.035]</td>
<td>[0.003]</td>
<td>[0.942]</td>
</tr>
<tr>
<td>Government owned</td>
<td>-0.130***</td>
<td>-0.120***</td>
<td>-0.008</td>
<td>-0.215***</td>
<td>-0.395***</td>
<td>0.003</td>
<td>0.578</td>
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<td>[1.317]</td>
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<tr>
<td>Log firm age</td>
<td>0.014***</td>
<td>0.008**</td>
<td>-0.007**</td>
<td>0.007</td>
<td>-0.018*</td>
<td>-0.001</td>
<td>-0.698</td>
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<td>[0.004]</td>
<td>[0.006]</td>
<td>[0.010]</td>
<td>[0.001]</td>
<td>[0.503]</td>
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<td>Private credit</td>
<td>0.023</td>
<td>0.014</td>
<td>0.240*</td>
<td>0.270</td>
<td>1.270***</td>
<td>0.021</td>
<td>-16.826</td>
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<td>[0.122]</td>
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<td>[0.289]</td>
<td>[0.020]</td>
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<tr>
<td>Inflation rate</td>
<td>-0.291***</td>
<td>-0.210**</td>
<td>0.044</td>
<td>-0.522***</td>
<td>-0.869***</td>
<td>0.067*</td>
<td>11.858</td>
</tr>
<tr>
<td></td>
<td>[0.091]</td>
<td>[0.094]</td>
<td>[0.084]</td>
<td>[0.123]</td>
<td>[0.227]</td>
<td>[0.036]</td>
<td>[11.060]</td>
</tr>
<tr>
<td>GDP growth rate</td>
<td>0.116</td>
<td>-0.159</td>
<td>0.240</td>
<td>-0.004</td>
<td>0.652</td>
<td>-0.722***</td>
<td>27.880</td>
</tr>
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<td></td>
<td>[0.275]</td>
<td>[0.327]</td>
<td>[0.432]</td>
<td>[0.742]</td>
<td>[0.865]</td>
<td>[0.219]</td>
<td>[51.227]</td>
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<tr>
<td>Observations</td>
<td>72,713</td>
<td>71,006</td>
<td>69,125</td>
<td>61,071</td>
<td>41,747</td>
<td>8,954</td>
<td>14,819</td>
</tr>
<tr>
<td>Number of countries</td>
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<td>65</td>
<td>64</td>
<td>65</td>
<td>37</td>
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<tr>
<td>Treatment countries</td>
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<td>7</td>
<td>7</td>
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<td>4</td>
<td>6</td>
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<tr>
<td>Control countries</td>
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<td>58</td>
<td>58</td>
<td>57</td>
<td>58</td>
<td>33</td>
<td>32</td>
</tr>
</tbody>
</table>
## 7. Results

### Economic significance

<table>
<thead>
<tr>
<th>Variable</th>
<th>Effect</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to finance</td>
<td>↑ 8 percentage points</td>
<td>60</td>
</tr>
<tr>
<td>Access to loan</td>
<td>↑ 7 percentage points</td>
<td>47</td>
</tr>
<tr>
<td>% of working capital financed by banks</td>
<td>↑ 10 percentage points</td>
<td>14</td>
</tr>
<tr>
<td>% of working capital financed by banks</td>
<td>↑ 20 percentage points</td>
<td>18</td>
</tr>
<tr>
<td>Interest rate</td>
<td>↓ 3 percentage points</td>
<td>13</td>
</tr>
<tr>
<td>Maturity</td>
<td>↑ 6 months</td>
<td>31</td>
</tr>
</tbody>
</table>
7. Results
Robustness tests

1. We conduct regressions weighted by the inverse of the number of observations per country.
2. We run estimations using a matched sample based on the availability of pre- and post-reform surveys, the geographic location and GDP per capita.
3. We run estimations with a control sample of countries that introduced collateral law reforms but did not introduce a collateral registry.

Our main results are robust to estimations 1, 2, & 3.
## 7. Results

Exploring differences across firm size

<table>
<thead>
<tr>
<th>Variables</th>
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<th>Working capital financed by banks</th>
<th>Fixed assets financed by banks</th>
<th>Interest rate</th>
<th>Maturity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registry reform</td>
<td>0.048</td>
<td>0.073**</td>
<td>0.033</td>
<td>0.075</td>
<td>0.076</td>
<td>-0.028*</td>
<td>3.991</td>
</tr>
<tr>
<td></td>
<td>[0.029]</td>
<td>[0.031]</td>
<td>[0.042]</td>
<td>[0.047]</td>
<td>[0.064]</td>
<td>[0.016]</td>
<td>[3.402]</td>
</tr>
<tr>
<td>Registry reform X Small sized firm</td>
<td>0.073*</td>
<td>-0.004</td>
<td>-0.069***</td>
<td>0.080*</td>
<td>0.275***</td>
<td>-0.001</td>
<td>3.161</td>
</tr>
<tr>
<td></td>
<td>[0.039]</td>
<td>[0.029]</td>
<td>[0.024]</td>
<td>[0.048]</td>
<td>[0.067]</td>
<td>[0.005]</td>
<td>[4.394]</td>
</tr>
<tr>
<td>Registry reform X Medium sized firm</td>
<td>0.035</td>
<td>0.013</td>
<td>-0.063***</td>
<td>0.009</td>
<td>0.110</td>
<td>-0.003</td>
<td>2.968</td>
</tr>
<tr>
<td></td>
<td>[0.023]</td>
<td>[0.029]</td>
<td>[0.017]</td>
<td>[0.039]</td>
<td>[0.088]</td>
<td>[0.003]</td>
<td>[3.392]</td>
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<tr>
<td>Small sized firm</td>
<td>-0.279***</td>
<td>-0.268***</td>
<td>0.068***</td>
<td>-0.340***</td>
<td>-0.546***</td>
<td>0.007**</td>
<td>-2.478**</td>
</tr>
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<td>[0.014]</td>
<td>[0.012]</td>
<td>[0.010]</td>
<td>[0.019]</td>
<td>[0.036]</td>
<td>[0.003]</td>
<td>[1.006]</td>
</tr>
<tr>
<td>Medium sized firm</td>
<td>-0.098***</td>
<td>-0.105***</td>
<td>0.045***</td>
<td>-0.101***</td>
<td>-0.180***</td>
<td>0.005*</td>
<td>-0.941</td>
</tr>
<tr>
<td></td>
<td>[0.010]</td>
<td>[0.010]</td>
<td>[0.007]</td>
<td>[0.012]</td>
<td>[0.024]</td>
<td>[0.002]</td>
<td>[0.659]</td>
</tr>
<tr>
<td>Observations</td>
<td>72,713</td>
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<td>61,071</td>
<td>41,747</td>
<td>8,954</td>
<td>14,819</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.231</td>
<td>0.158</td>
<td>0.135</td>
<td>0.117</td>
<td>0.092</td>
<td>0.532</td>
<td>0.157</td>
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<tr>
<td>Treatment countries</td>
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<td>7</td>
<td>7</td>
<td>7</td>
<td>4</td>
<td>6</td>
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<td>59</td>
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<td>57</td>
<td>58</td>
<td>33</td>
<td>32</td>
</tr>
</tbody>
</table>
8. Conclusions

- We study the impact of movable collateral registry reform on access to finance.
- We find that in countries that introduced registries for movable collateral, firms experience increased access to finance, as well as declines in interest rates and extensions in loan maturity.
- Our methodology and robustness tests allow us to isolate the impact of registry reform from all other relevant time-invariant country characteristics and time-specific shocks.
- In addition, we show that introducing a new registry for movable collateral has stronger benefits for small firms, which are often more constrained in their access to finance and do not have many fixed assets that can serve as collateral.
THANK YOU!