Motivation

- Size of venture capital markets per GDP differs significantly across developed and emerging markets

- Venture capital finance
  - Risk capital
  - Value-added active investors
  - Governance
  - Not diversified
  - Role of legal protections to mitigate idiosyncratic risk
Prior Research

- Law and Finance
  - Berkowitz et al. (2003 European Economic Review)

- Venture Capital meets Law and Finance
  - VC Contracts:
    - Lerner and Schoar (2005 Quarterly Journal of Economics)
    - Kaplan et al. (2005 Working Paper)
    - Cumming and Johan (2006 European Financial Management)
  - VC Exits:
    - Cumming et al. (2006 Journal of Corporate Finance)
  - Size of VC Markets
    - Jeng and Wells (2000 Journal of Corporate Finance)
  - Datasets not large (200 or so observations) due to private nature of VC data
This Paper’s New Contributions

- Complementary Elements of VC Governance Worldwide:
  - Screening
  - Syndication
  - Co-investment
  - Board Seats
  - *Functional* Definition of Security

- Data
  - 3838 VC-backed companies
  - 39 countries, developed and developing, worldwide
  - Extensive confidential details not previously studied
  - Massive & detailed data!

Outline

- Hypotheses
- Data
- Tests
- Conclusion
Law and Venture Governance

- Law quality facilitates
  - Deal screening time
  - Syndication
  - Effectiveness of boards

- Law quality mitigates
  - Co-investment
  - Securities requiring periodic cash flows pre-exit

- How to measure law quality
  - Legality (Berkowitz et al.’s weighted average of La Porta et al.’s indices)
  - Legal Origin versus Country Dummy Variables

### Table: Law Quality and GNP Per Capita

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Philippines</td>
<td>4.75</td>
<td>2.73</td>
<td>2.92</td>
<td>5.22</td>
<td>4.8</td>
<td>8.51</td>
<td>850</td>
</tr>
<tr>
<td>Indonesia</td>
<td>2.5</td>
<td>3.98</td>
<td>2.15</td>
<td>7.16</td>
<td>6.09</td>
<td>9.16</td>
<td>740</td>
</tr>
<tr>
<td>Argentina</td>
<td>6</td>
<td>5.35</td>
<td>6.02</td>
<td>5.91</td>
<td>4.91</td>
<td>12.34</td>
<td>7220</td>
</tr>
<tr>
<td>India</td>
<td>8</td>
<td>4.17</td>
<td>4.58</td>
<td>7.75</td>
<td>6.11</td>
<td>12.8</td>
<td>300</td>
</tr>
<tr>
<td>Brazil</td>
<td>5.75</td>
<td>6.32</td>
<td>6.32</td>
<td>7.62</td>
<td>6.3</td>
<td>14.09</td>
<td>2930</td>
</tr>
<tr>
<td>Greece</td>
<td>7</td>
<td>6.18</td>
<td>7.27</td>
<td>7.12</td>
<td>6.62</td>
<td>14.91</td>
<td>7390</td>
</tr>
<tr>
<td>Israel</td>
<td>10</td>
<td>4.82</td>
<td>8.33</td>
<td>8.25</td>
<td>7.54</td>
<td>16.54</td>
<td>13920</td>
</tr>
<tr>
<td>Malaysia</td>
<td>9</td>
<td>6.78</td>
<td>7.38</td>
<td>7.95</td>
<td>7.43</td>
<td>16.67</td>
<td>3140</td>
</tr>
<tr>
<td>Taiwan</td>
<td>6.75</td>
<td>8.52</td>
<td>6.85</td>
<td>9.12</td>
<td>9.16</td>
<td>17.62</td>
<td>10425</td>
</tr>
<tr>
<td>Ireland</td>
<td>8.75</td>
<td>7.8</td>
<td>8.52</td>
<td>9.67</td>
<td>8.96</td>
<td>18.92</td>
<td>13000</td>
</tr>
<tr>
<td>Singapore</td>
<td>10</td>
<td>8.57</td>
<td>8.22</td>
<td>9.3</td>
<td>8.86</td>
<td>19.53</td>
<td>19850</td>
</tr>
<tr>
<td>France</td>
<td>8</td>
<td>8.98</td>
<td>9.05</td>
<td>9.65</td>
<td>9.19</td>
<td>19.67</td>
<td>22490</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>10</td>
<td>8.57</td>
<td>9.1</td>
<td>9.71</td>
<td>9.63</td>
<td>20.41</td>
<td>18060</td>
</tr>
<tr>
<td>Germany</td>
<td>9</td>
<td>9.23</td>
<td>8.93</td>
<td>9.9</td>
<td>9.77</td>
<td>20.44</td>
<td>23560</td>
</tr>
<tr>
<td>United States</td>
<td>10</td>
<td>10</td>
<td>8.63</td>
<td>9.98</td>
<td>9</td>
<td>20.85</td>
<td>24740</td>
</tr>
</tbody>
</table>
Data

- 3838 VC-backed companies
- 39 countries, developed and developing, worldwide

Source: CEPRES, Germany
- Partnership among practitioners worldwide to improve data quality for decision making in private equity
- Extensive confidential details not previously studied
- Massive & detailed data!

- Little expected sample bias
  - Good and poor performing investments
  - Exited and un-exited investments
  - Matches profile of VC investments across countries and across time

Number of Investments by Year

![Number of Investments by Year](chart.png)
## Time to deal origination

- Time from starting the VC fund until the first-round lead investment
- Not previously studied in any single or multiple country study
- Hazard models
- Legality index from 20 to 21 (e.g. France versus US) lowers the time until lead first investment by 6.6%
- Legality index from 10 to 11 (e.g. Philippines versus Indonesia) lowers the time until lead first investment by 13.2%

<table>
<thead>
<tr>
<th></th>
<th># Ent Firms</th>
<th>Average Duration (Holding Period in Days) until First Investment</th>
<th>Difference Test (means)</th>
<th>Median Duration (Holding Period in Days) until First Investment</th>
<th>Difference Test (medians)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legality Index &gt; 20.5</td>
<td>2052</td>
<td>718.762</td>
<td>-8.479***</td>
<td>469</td>
<td>p &lt;= 1.21e-08***</td>
</tr>
<tr>
<td>Legality Index &lt; 20.5</td>
<td>1140</td>
<td>1042.399</td>
<td></td>
<td>660</td>
<td></td>
</tr>
<tr>
<td>Market and Legal Factors</td>
<td>Model (4)</td>
<td>Model (5)</td>
<td>Model (6)</td>
<td>Model (7)</td>
<td></td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-----------</td>
<td>-----------</td>
<td>-----------</td>
<td>-----------</td>
<td></td>
</tr>
<tr>
<td>Log (1+ MSCI Return at Inv Date)</td>
<td>0.439*</td>
<td>0.488**</td>
<td>0.467</td>
<td>0.774***</td>
<td></td>
</tr>
<tr>
<td>Log (Committed Capital Overall Market at Inv Date)</td>
<td>0.011</td>
<td>-0.227***</td>
<td>0.007</td>
<td>-0.276***</td>
<td></td>
</tr>
<tr>
<td>Log (Legality Index)</td>
<td>3.007***</td>
<td>2.507***</td>
<td>2.645**</td>
<td>2.624**</td>
<td></td>
</tr>
<tr>
<td>VC Fund Characteristics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log (Fund Number in the VC Firm)</td>
<td>0.077</td>
<td>0.254***</td>
<td>-0.365***</td>
<td>0.210***</td>
<td></td>
</tr>
<tr>
<td>(Fund Date Time Trend)^-2</td>
<td>0.537</td>
<td>-0.759</td>
<td>0.394</td>
<td>-0.356</td>
<td></td>
</tr>
<tr>
<td>Log (Fund Capital / General Partner)</td>
<td>0.0232</td>
<td>---</td>
<td>0.224***</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>Entrepreneurial Firm Characteristics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seed Stage</td>
<td>0.734***</td>
<td>0.934***</td>
<td>0.908***</td>
<td>1.139***</td>
<td></td>
</tr>
<tr>
<td>Start-up Stage</td>
<td>0.298*</td>
<td>0.464***</td>
<td>0.359*</td>
<td>0.847***</td>
<td></td>
</tr>
<tr>
<td>Early Stage</td>
<td>-0.135</td>
<td>-0.091</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>Expansion Stage</td>
<td>-0.128</td>
<td>0.036</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>Log (Industry Market / Book)</td>
<td>0.569***</td>
<td>0.494***</td>
<td>0.452***</td>
<td>0.151</td>
<td></td>
</tr>
<tr>
<td>Industry Dummy Variables?</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Country Dummy Variables?</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Investment Year Dummies?</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Investment Characteristics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log (Amount Invested)</td>
<td>-0.089***</td>
<td>-0.101***</td>
<td>-0.072**</td>
<td>-0.089***</td>
<td></td>
</tr>
<tr>
<td>Model Diagnostics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Number of Observations</td>
<td>2284</td>
<td>3176</td>
<td>1091</td>
<td>1311</td>
<td></td>
</tr>
<tr>
<td>Pseudo R^2</td>
<td>0.025</td>
<td>0.025</td>
<td>0.044</td>
<td>0.034</td>
<td></td>
</tr>
<tr>
<td>Chi Square</td>
<td>256.880***</td>
<td>403.271***</td>
<td>213.005***</td>
<td>208.963***</td>
<td></td>
</tr>
</tbody>
</table>

### Syndication and Co-Investment

- **Syndication**
  - Typically 'Good'
  - Decision making, value-added, 2 heads better than 1
  - Legality 20 to 21: increases the probability of syndication by 3.0%
  - Legality 10 to 11: increases the probability of syndication by 5.8%

- **Co-Investment**
  - Typically 'Bad'
  - One VC fund bails out bad investments of prior VC fund from the same VC organization
  - Legality 20 to 21: reduces probability of co-investment by 1.9%
  - Legality 10 to 11: reduces the probability of co-investment by 3.7%
<table>
<thead>
<tr>
<th>Legality Index &gt; 20.5</th>
<th># Firms</th>
<th>Proportion of Syndicated Investments</th>
<th>Difference Test</th>
<th># Firms</th>
<th>Proportion of Co-Investments</th>
<th>Difference Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1303</td>
<td>0.413</td>
<td>-0.848</td>
<td>1875</td>
<td>0.167</td>
<td>-4.650***</td>
</tr>
<tr>
<td>Legality Index &lt; 20.5</td>
<td>848</td>
<td>0.432</td>
<td></td>
<td>930</td>
<td>0.270</td>
<td></td>
</tr>
</tbody>
</table>

### Model Diagnostics

<table>
<thead>
<tr>
<th></th>
<th>Marginal Effect Prob Syndication=0</th>
<th>Marginal Effect Prob Syndication=1</th>
<th>Marginal Effect Prob Co-Investment=0</th>
<th>Marginal Effect Prob Co-Investment=1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.068</td>
<td>-0.067</td>
<td>-0.708**</td>
<td>0.709**</td>
</tr>
<tr>
<td>Market and Legal Factors</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log (MSCI Return at Inv Date)</td>
<td>0.005</td>
<td>-0.001</td>
<td>0.024</td>
<td>-0.020</td>
</tr>
<tr>
<td>Log (Committed Capital Overall Market)</td>
<td>-0.002</td>
<td>0.002</td>
<td>-0.026*</td>
<td>0.025*</td>
</tr>
<tr>
<td>Log (Legality Index)</td>
<td>-0.877***</td>
<td>0.033*</td>
<td>0.386***</td>
<td>-0.386***</td>
</tr>
<tr>
<td>VC Fund Characteristics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log (Fund Number in the VC Firm)</td>
<td>0.026**</td>
<td>-0.010**</td>
<td>-0.004</td>
<td>0.009</td>
</tr>
<tr>
<td>Log (Fund Age at First Investment)</td>
<td>-0.0002</td>
<td>-0.0001</td>
<td>0.005</td>
<td>-0.005</td>
</tr>
<tr>
<td>Log (Fund Age Time Trend)**</td>
<td>11.338***</td>
<td>-4.788**</td>
<td>0.870</td>
<td>-0.417</td>
</tr>
<tr>
<td>Entrepreneurial Firm Characteristics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seed Stage</td>
<td>-0.013*</td>
<td>0.008*</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Start-up Stage</td>
<td></td>
<td></td>
<td>-0.058</td>
<td>0.059</td>
</tr>
<tr>
<td>Early Stage</td>
<td>-0.003</td>
<td>0.004*</td>
<td>-0.006</td>
<td>0.010</td>
</tr>
<tr>
<td>Expansion Stage</td>
<td>0.006*</td>
<td>-0.003</td>
<td>-0.029</td>
<td>0.027</td>
</tr>
<tr>
<td>Log (Industry Market / Book)</td>
<td>-0.012**</td>
<td>0.006*</td>
<td>-0.037**</td>
<td>0.038**</td>
</tr>
<tr>
<td>Industry Dummy Variables?</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Country Dummy Variables?</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Investment Year Dummies?</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Investment Characteristics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log (Amount Invested)</td>
<td>0.001*</td>
<td>-0.0004</td>
<td>-0.001</td>
<td>0.0004</td>
</tr>
<tr>
<td>Model Diagnostics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Number of Observations</td>
<td>3176</td>
<td>3176</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number No Syndication (No Co-Investment)</td>
<td>1245</td>
<td>2227</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pseudo R²</td>
<td>0.225</td>
<td>0.257</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Board Seats & Functional Security

- **Board seats**
  - VC board representation more important than that of other investors 
    (Gompers and Lerner 1999 MIT Press)
  - Legality 20 to 21: increases the probability of board seats by 4.3%
  - Legality 10 to 11: increases the probability of board seats by 8.4%

- **Functional security**
  - Security mandates periodic cash flows paid back to the investor prior to an exit event
  - Not previously considered in any VC study for single and/or multiple countries
  - Legality 20 to 21: reduces the probability of periodic cash flows by 1.9%
  - Legality 10 to 11: reduces the probability of periodic cash flows by 3.8%
  - Closely tied to probability of high-tech investment

<table>
<thead>
<tr>
<th>Legality Index</th>
<th># Ent Firms</th>
<th>Proportion of Investments with Board Seats</th>
<th>Difference Test</th>
<th># Ent Firms</th>
<th>Proportion of Investments with Periodic Cash Flows</th>
<th>Difference Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 20.5</td>
<td>828</td>
<td>0.722</td>
<td>-0.240</td>
<td>2052</td>
<td>0.335</td>
<td>-5.072***</td>
</tr>
<tr>
<td>&lt; 20.5</td>
<td>378</td>
<td>0.728</td>
<td></td>
<td>1140</td>
<td>0.429</td>
<td></td>
</tr>
</tbody>
</table>
### Model Diagnostics

<table>
<thead>
<tr>
<th></th>
<th>Model (4)</th>
<th>Model (5)</th>
<th>Model (6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pseudo R²</td>
<td>0.230</td>
<td>0.194</td>
<td>0.322</td>
</tr>
<tr>
<td>Total Number of Observations</td>
<td>3176</td>
<td>3176</td>
<td>3176</td>
</tr>
<tr>
<td>Marginal Effect Probability Periodic Cash Flows=1</td>
<td>1.202</td>
<td>0.366</td>
<td>0.218</td>
</tr>
</tbody>
</table>

### Model (9) Model (6) Model (5) Model (4)

<table>
<thead>
<tr>
<th></th>
<th>Marginal Effect Prob Board Seats=1</th>
<th>Marginal Effect Prob Board Seats=1</th>
<th>Marginal Effect Probability Periodic Cash Flows=1</th>
<th>Marginal Effect Probability Periodic Cash Flows=1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-3.664***</td>
<td>-0.428</td>
<td>1.202</td>
<td>-0.859</td>
</tr>
<tr>
<td>Market and Legal Factors</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log (1 + MSCI Return at Inv Date)</td>
<td>-0.050</td>
<td>0.006</td>
<td>0.340***</td>
<td>0.366***</td>
</tr>
<tr>
<td>Log (Committed Capital Overall Mkt)</td>
<td>0.115***</td>
<td>0.007</td>
<td>-0.079***</td>
<td>-0.036***</td>
</tr>
<tr>
<td>Log (Legality Index)</td>
<td>0.886***</td>
<td>0.179*</td>
<td>-0.394***</td>
<td>0.281</td>
</tr>
<tr>
<td>VC Fund Characteristics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log (Fund Number at the VC Firms)</td>
<td>-0.100***</td>
<td>-0.026**</td>
<td>-0.094***</td>
<td>-0.074***</td>
</tr>
<tr>
<td>Log (Fund Age at First Investment since Fundraising)</td>
<td>-0.017***</td>
<td>-0.002</td>
<td>0.005</td>
<td>-0.003</td>
</tr>
<tr>
<td>Entrepreneurial Firm Characteristics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seed Stage</td>
<td>0.313***</td>
<td>0.069**</td>
<td>-0.170***</td>
<td>-0.228***</td>
</tr>
<tr>
<td>Start-up Stage</td>
<td>-0.253***</td>
<td>-0.057***</td>
<td>-0.404***</td>
<td>-0.310***</td>
</tr>
<tr>
<td>Early Stage</td>
<td>0.188***</td>
<td>0.042**</td>
<td>-0.219***</td>
<td>-0.150***</td>
</tr>
<tr>
<td>Expansion Stage</td>
<td>0.090***</td>
<td>0.022**</td>
<td>0.011</td>
<td>0.038</td>
</tr>
<tr>
<td>Log (Industry Market / Book)</td>
<td>0.213***</td>
<td>0.043**</td>
<td>--</td>
<td>-0.143***</td>
</tr>
<tr>
<td>Industry Dummy Variables?</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Country Dummy Variables?</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Investment Year Dummies?</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Investment Characteristics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lead Investor</td>
<td>0.287***</td>
<td>0.053**</td>
<td>0.125***</td>
<td>0.149***</td>
</tr>
<tr>
<td>Log (Amount Invested)</td>
<td>-0.056***</td>
<td>-0.012**</td>
<td>0.585***</td>
<td>0.043***</td>
</tr>
<tr>
<td>Model Diagnostics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marginal Effect Probability Periodic Cash Flows=1</td>
<td>1.202</td>
<td>0.366</td>
<td>0.218</td>
<td>0.859</td>
</tr>
</tbody>
</table>

### Robustness Checks

- Country dummy variables for English, US, France, German versus legal origin
- Alternative explanatory variables
  - Market conditions, e.g., MSCI, VC capital in market
  - VC fund characteristics
  - Entrepreneurial firm characteristics
  - Transaction characteristics
- Exclusion of certain countries – e.g., exclude developed countries
- Exclusion of different years – e.g., exclude all years prior to 1995
Concluding Remarks

- Law quality facilitates
  - Deal screening time
  - Syndication
  - Effectiveness of boards

- Law quality mitigates
  - Co-investment
  - Securities requiring periodic cash flows pre-exit (in conjunction with high-tech investment)

- Legality has a more pronounced effect on emerging markets

- Effective VC investment will continue to lag behind in emerging countries whilst legal quality remains deficient