

# Disclosure Law and External Audit Demand: Evidence from Latin America

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# Motivation

- Disclosure
  - Mitigates agency frictions
  - Increases internal control effectiveness
  - Improves resource allocation efficiency
- Policy justification
  - Market failure from sub-optimal voluntary audit demand

## Theory

Hidden action model with wealth-constrained agent and external financing  
(Doidge, Karolyi, & Stulz, 2007)

Agent's objective function:

$$\text{Max}_f k(1-f)aK^\alpha + faK^\alpha - 0.5bf^2aK^\alpha(p+q) \quad (1)$$

F.O.C. and solve for  $f$ :

$$f = \frac{1-k}{b(p+q)} \quad (2)$$

Solving for  $p$ :

$$p = \frac{1-k}{bf} - q \quad (3)$$

Therefore:

$$\frac{\partial p}{\partial q} < 0 \quad (4)$$

**Proposition 1:** *Country-level and firm-level governance are substitutes.*

# Contribution

- Extends evidence in Latin America
  - Chong, Alberto and Florencio López-de-Silanes (2007)
    - Evidence based on publicly listed firms
  - Francis, Jere R., Inder K. Khurana, Xiumin Martin, and Raynolde Pereira (2011)
    - Focus on legal jurisdictions
    - Correlation analysis

- Publicly available panel from 18 countries in Latin America
  - Firm-level
    - World Bank Enterprise Surveys
  - Country-level
    - World Bank Doing Business
    - Americas Barometer Survey

Table: Latin American Countries in Dataset

| <u>Treated</u> |                         | <u>Controls</u>    |                  |
|----------------|-------------------------|--------------------|------------------|
| country        | year                    | country            | year             |
| Ecuador        | 2006, 2010, <b>2017</b> | Argentina          | 2006, 2010, 2017 |
| Honduras       | 2006, 2010, <b>2016</b> | Bolivia            | 2006, 2010, 2017 |
| Mexico         | 2006, <b>2010</b>       | Brazil             | 2009             |
| Peru           | 2006, <b>2010, 2017</b> | Chile              | 2006, 2010       |
|                |                         | Colombia           | 2006, 2010, 2017 |
|                |                         | Dominican Republic | 2010, 2016       |
|                |                         | El Salvador        | 2006, 2010, 2016 |
|                |                         | Guatemala          | 2006, 2010, 2017 |
|                |                         | Nicaragua          | 2006, 2010, 2016 |
|                |                         | Panama             | 2006, 2010       |
|                |                         | Paraguay           | 2006, 2010, 2017 |
|                |                         | Suriname           | 2010, 2018       |
|                |                         | Uruguay            | 2006, 2010, 2017 |
|                |                         | Venezuela          | 2006, 2010       |

Table: Summary Statistics: Small Firms

| variables           | Treated |         |        |          |     | Untreated |         |       |          |       |
|---------------------|---------|---------|--------|----------|-----|-----------|---------|-------|----------|-------|
|                     | mean    | std dev | min    | max      | obs | mean      | std dev | min   | max      | obs   |
| <i>extaudit</i>     | 0.224   | 0.417   | 0      | 1        | 451 | 0.441     | 0.497   | 0     | 1        | 3,967 |
| <i>disclosure</i>   | 7.508   | 2.052   | 2      | 9        | 451 | 4.417     | 2.809   | 0     | 9        | 3,967 |
| <i>dirliablaw</i>   | 5.559   | 0.898   | 5      | 8        | 451 | 3.809     | 2.007   | 0     | 8        | 3,967 |
| <i>creditinfsys</i> | 6       | 0       | 6      | 6        | 451 | 5.222     | 1.159   | 0     | 6        | 3,967 |
| <i>trust</i>        | 0.493   | 0.077   | 0.429  | 0.635    | 451 | 1.563     | 4.309   | 0.376 | 22.4     | 3,586 |
| <i>ownershare</i>   | 75.106  | 25.204  | 18     | 100      | 348 | 73.4      | 26.868  | 0     | 100      | 3,206 |
| <i>foreignshare</i> | 1.6     | 11.694  | 0      | 100      | 450 | 4.25      | 18.879  | 0     | 100      | 3,848 |
| <i>femownpr</i>     | 0.419   | 0.494   | 0      | 1        | 451 | 0.419     | 0.494   | 0     | 1        | 3,831 |
| <i>salesgrowth</i>  | 13.938  | 250.976 | -0.923 | 4,614.39 | 338 | 9.907     | 136.025 | -1    | 4152.246 | 2,765 |
| <i>exportsales</i>  | 2.036   | 11.597  | 0      | 100      | 450 | 3.325     | 14.006  | 0     | 100      | 3,966 |
| <i>fainternal</i>   | 47.194  | 42.263  | 0      | 100      | 196 | 61.961    | 42.676  | 0     | 100      | 1,767 |
| <i>age</i>          | 2.929   | 0.613   | 0.693  | 5.056    | 448 | 2.914     | 0.721   | 0     | 5.236    | 3,953 |
| <i>industry</i>     | 0.652   | 0.477   | 0      | 1        | 451 | 0.594     | 0.491   | 0     | 1        | 3,945 |
| <i>judsysperc</i>   | 1.559   | 0.853   | 1      | 4        | 438 | 1.784     | 0.896   | 1     | 4        | 3,722 |

Table: Summary Statistics: Medium-sized Firms

| variables            | Treated |         |        |       |     | Untreated |         |       |           |       |
|----------------------|---------|---------|--------|-------|-----|-----------|---------|-------|-----------|-------|
|                      | mean    | std dev | min    | max   | obs | mean      | std dev | min   | max       | obs   |
| <i>extaudit</i>      | 0.426   | 0.495   | 0      | 1     | 503 | 0.594     | 0.491   | 0     | 1         | 3,790 |
| <i>disclosure</i>    | 7.48    | 2.106   | 2      | 9     | 503 | 4.633     | 2.779   | 0     | 9         | 3,790 |
| <i>dirliablaw</i>    | 5.447   | 0.779   | 5      | 8     | 503 | 4.07      | 2.264   | 0     | 8         | 3,790 |
| <i>creditinfosys</i> | 6       | 0       | 6      | 6     | 503 | 5.264     | 1.099   | 0     | 6         | 3,790 |
| <i>trust</i>         | 0.489   | 0.074   | 0.429  | 0.635 | 503 | 1.149     | 3.248   | 0.376 | 22.4      | 3,334 |
| <i>ownership</i>     | 66.991  | 27.041  | 4      | 100   | 433 | 67.544    | 27.587  | 0     | 100       | 3,224 |
| <i>foreignshare</i>  | 6.09    | 22.42   | 0      | 100   | 501 | 7.6       | 24.82   | 0     | 100       | 3,671 |
| <i>femownpr</i>      | 0.42    | 0.494   | 0      | 1     | 498 | 0.401     | 0.49    | 0     | 1         | 3,622 |
| <i>salesgrowth</i>   | 0.449   | 1.973   | -0.999 | 27.67 | 391 | 8.299     | 110.671 | -1    | 2,494.485 | 2,862 |
| <i>exportsales</i>   | 9.6     | 24.831  | 0      | 100   | 498 | 6.289     | 18.346  | 0     | 100       | 3,780 |
| <i>fainternal</i>    | 47.015  | 43.553  | 0      | 100   | 329 | 57.095    | 42.551  | 0     | 100       | 2,295 |
| <i>age</i>           | 3.192   | 0.588   | 1.099  | 5.1   | 502 | 3.111     | 0.683   | 0     | 5.142     | 3,773 |
| <i>industry</i>      | 0.66    | 0.474   | 0      | 1     | 503 | 0.626     | 0.484   | 0     | 1         | 3,751 |
| <i>judyspercp</i>    | 1.567   | 0.791   | 1      | 4     | 492 | 1.841     | 0.905   | 1     | 4         | 3,615 |

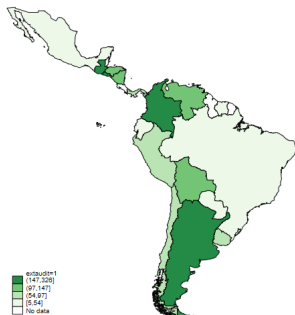


Table: Summary Statistics: Large Firms

| variables           | Treated |         |        |         |     | Untreated |         |        |           |       |
|---------------------|---------|---------|--------|---------|-----|-----------|---------|--------|-----------|-------|
|                     | mean    | std dev | min    | max     | obs | mean      | std dev | min    | max       | obs   |
| <i>extaudit</i>     | 0.779   | 0.415   | 0      | 1       | 340 | 0.838     | 0.369   | 0      | 1         | 2,231 |
| <i>disclosure</i>   | 7.659   | 1.987   | 2      | 9       | 340 | 4.57      | 2.793   | 0      | 9         | 2,231 |
| <i>dirliablaw</i>   | 5.494   | 0.766   | 5      | 8       | 340 | 3.991     | 2.247   | 0      | 8         | 2,231 |
| <i>creditinfo</i>   | 6       | 0       | 6      | 6       | 340 | 5.369     | 0.797   | 0      | 6         | 2,231 |
| <i>trust</i>        | 0.492   | 0.073   | 0.429  | 0.635   | 340 | 0.982     | 2.657   | 0.376  | 22.4      | 2,074 |
| <i>ownershare</i>   | 68.61   | 28.176  | 3      | 100     | 300 | 65.059    | 28.782  | 0      | 100       | 1,887 |
| <i>foreignshare</i> | 20.908  | 37.743  | 0      | 100     | 338 | 19.317    | 37.163  | 0      | 100       | 2,177 |
| <i>femownpr</i>     | 0.312   | 0.464   | 0      | 1       | 333 | 0.364     | 0.481   | 0      | 1         | 2,096 |
| <i>salesgrowth</i>  | 2.718   | 39.376  | -0.667 | 645.879 | 269 | 24.008    | 344.727 | -0.999 | 11,110.11 | 1,695 |
| <i>exportsales</i>  | 20.325  | 31.81   | 0      | 100     | 338 | 13.75     | 25.95   | 0      | 100       | 2,227 |
| <i>fainternal</i>   | 36.916  | 41.05   | 0      | 100     | 262 | 55.89     | 42.142  | 0      | 100       | 1,688 |
| <i>age</i>          | 3.392   | 0.693   | 0      | 4.788   | 337 | 3.37      | 0.733   | 0.693  | 5.204     | 2,208 |
| <i>industry</i>     | 0.721   | 0.449   | 0      | 1       | 340 | 0.612     | 0.488   | 0      | 1         | 2,229 |
| <i>judsysperc</i>   | 1.584   | 0.789   | 1      | 4       | 334 | 1.968     | 0.934   | 1      | 4         | 2,145 |

- Dependent Variable: *extaudit*
  - binary indicator equaling one if a firm's financial statements were checked and certified by external auditors in the last fiscal year, and zero otherwise.
- Key Independent Variable: *disclosure* × *treat*
  - *disclosure* is sum of five sub-indices' scores:
    - Which corporate body can provide legally sufficient approval for a transaction (0-3)
    - If external body such as an independent auditor must review a transaction before it takes place (0-1)
    - If disclosure by controlling shareholder to the board of directors or the supervisory board is required (0-2)
    - If immediate disclosure of transaction or conflict of interest to the public, the regulator or the shareholders is required (0-2)
    - If disclosure of transaction or conflict of interest in periodic filings is required (0-2)
  - *treat* binary indicator equaling one if a firm is in a country experiencing within variation in *disclosure*, and zero otherwise.

*extaudit* = 1



Small firms in subsample

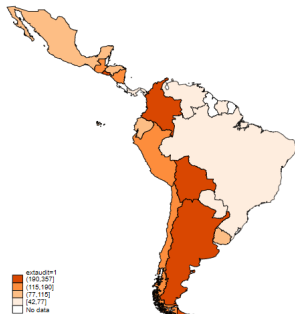
disclosure



Small firms in subsample

**Figure: External audit demand and disclosure**

*extaudit* = 1



Medium-sized firms in subsample

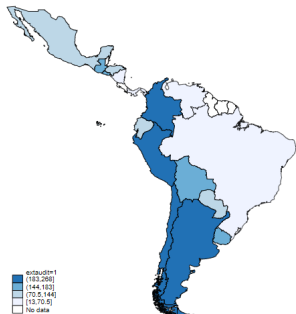
disclosure



Medium-sized firms in subsample

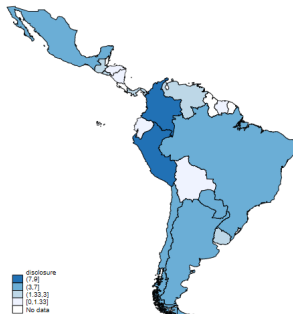
**Figure: External audit demand and disclosure**

*extaudit* = 1



Large firms in subsample

disclosure



Large firms in subsample

**Figure: External audit demand and disclosure**

- Difference-in-Differences on Panel
  - Random effects probit

$$y_{ict} - \hat{\lambda}\bar{y}_{ic} = \beta_0(1 - \hat{\lambda}) + (X_{ct} - \hat{\lambda}\bar{X}_{ic})\beta + (\Gamma_{ict} - \hat{\lambda}\bar{\Gamma}_{ic})\delta + (\eta_{ict} - \hat{\lambda}\bar{\eta}_{ic}) \quad (5)$$

- Robustness Tests
  - Multiple imputation
  - Nearest neighbor matching (knn=5)

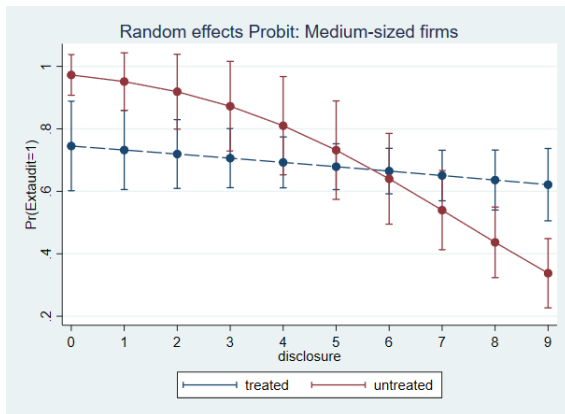
# Results

**Table: Marginal Effects: Random Effects Probit on Panel**

| Variables                        | (1)<br>Small        | (2)<br>Medium        | (3)<br>Large      |
|----------------------------------|---------------------|----------------------|-------------------|
| <i>disclosure</i>                | -0.017<br>(0.017)   | -0.015<br>(0.014)    | -0.01*<br>(0.006) |
| <i>treat</i>                     | -0.369**<br>(0.176) | 0.499**<br>(0.203)   | 0.751<br>(0.562)  |
| <i>disclosure</i> × <i>treat</i> | 0.018<br>(0.023)    | -0.088***<br>(0.022) | -0.097<br>(0.064) |
| No. of unique firms              | 934                 | 1,244                | 919               |
| Wald $\chi^2$ p-value            | 0.000               | 0.000                | 0.000             |
| Year                             | Yes                 | Yes                  | Yes               |

*extaudit* is dependent variable; controls include *dirliablaw*, *trust*, *creditinfosys*, *ownershare*, *foreignshare*, *femaleownpr*, *salesgrowth*, *exportsales*, *fainternal*, *age*, *judsyspercp*, and *industry*; Delta standard errors clustered at the country-level are in parentheses; \*\*\*  $p < 0.01$ ; \*\*  $0.01 \leq p < 0.05$ ; \*  $0.05 \leq p < 0.1$  for two-tailed tests.

# Results



Note: 95% confidence intervals are displayed

Figure: Predicted extaudit against disclosure



# Results

**Table: Marginal Effects: Random Effects Probit on Imputed Panel**

| Variables                        | (1)<br>Small         | (2)<br>Medium        | (3)<br>Large        |
|----------------------------------|----------------------|----------------------|---------------------|
| <i>disclosure</i>                | -0.007<br>(0.013)    | -0.01<br>(0.01)      | -0.012**<br>(0.006) |
| <i>treat</i>                     | 0.088<br>(0.072)     | 0.19**<br>(0.094)    | 0.03<br>(0.076)     |
| <i>disclosure</i> × <i>treat</i> | -0.032***<br>(0.011) | -0.044***<br>(0.014) | -0.011<br>(0.011)   |
| No. of unique firms              | 2,677                | 2,728                | 1,545               |
| F-statistic p-value              | 0.000                | 0.000                | 0.000               |
| <i>Year</i>                      | Yes                  | Yes                  | Yes                 |

No. of imputations = 5; *extaudit* is dependent variable; controls include *dirliablaw*, *trust*, *creditinfsys*, *ownershare*, *foreignshare*, *femaleownpr*, *salesgrowth*, *exportsales*, *fainternal*, *age*, *judsyspercp*, and *industry*; Delta standard errors clustered at the country-level are in parentheses; \*\*\*  $p < 0.01$ ; \*\*  $0.01 \leq p < 0.05$ ; \*  $0.05 \leq p < 0.1$  for two-tailed tests.

# Results

Table: Nearest-Neighbor Matched Sample: Panel

| Variables                | (1)<br>Small         | (2)<br>Medium        | (3)<br>Large         | (4)<br>Small         | (5)<br>Medium        | (6)<br>Large         |
|--------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| 2010:                    |                      |                      |                      |                      |                      |                      |
| <i>ATT</i>               | -0.301**<br>(0.069)  | -0.274***<br>(0.05)  | -0.02<br>(0.041)     | -1.36***<br>(0.093)  | -0.898***<br>(0.064) | -0.371***<br>(0.065) |
| No. of observations      | 398                  | 725                  | 619                  | 398                  | 725                  | 619                  |
| 2017                     |                      |                      |                      |                      |                      |                      |
| <i>ATT</i>               | -0.356***<br>(0.088) | -0.395***<br>(0.076) | -0.207***<br>(0.062) | -0.369***<br>(0.104) | -0.427***<br>(0.076) | -0.169***<br>(0.057) |
| No. of observations      | 161                  | 242                  | 264                  | 161                  | 242                  | 264                  |
| Country-level covariates | No                   | No                   | No                   | Yes                  | Yes                  | Yes                  |
| Firm-level covariates    | Yes                  | Yes                  | Yes                  | Yes                  | Yes                  | Yes                  |

$k = 5$ ; Mahalanobis distance metric is used in matching; *extaudit* is dependent variable; country-level covariates include *dirliablaw*, *trust*, and *creditinfosys*; firm-level covariates include *ownershare*, *foreignshare*, *femaleownpr*, *salesgrowth*, *exportsales*, *fainternal*, *age*, *judsyspercp*, and *industry*; AI robust standard errors are in parentheses;

\*\*\*  $p < 0.01$ ; \*\*  $0.01 \leq p < 0.05$ ; \*  $0.05 \leq p < 0.1$  for two-tailed tests.

## Conclusion

- A unit increase in the disclosure law index score reduces probability of external audit choice in privately held, medium-sized firms in Latin America by 8.8 percentage points.
- Supports agency theory's prediction that country and firm-level governance are substitutes
- Unintended consequences may result if principals do not enforce standards of disclosure policy