

The Impact of Payroll Taxes on Informality: The Case of the 2012 Colombian Tax Reform

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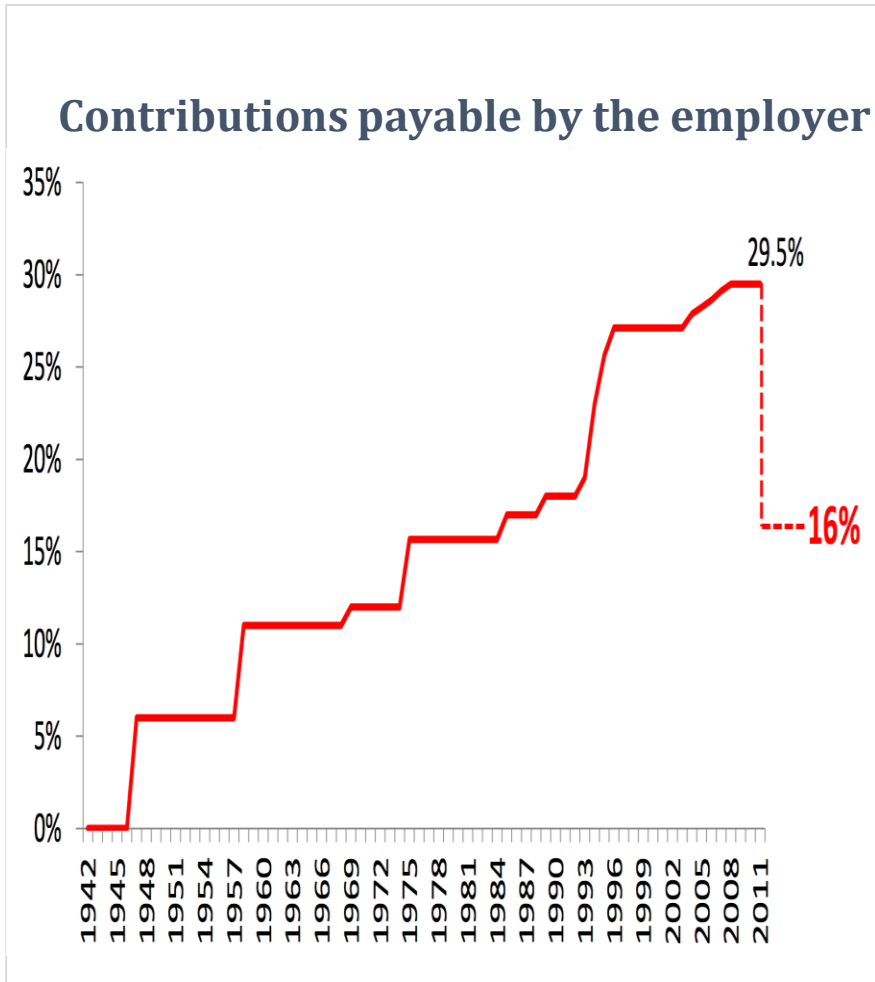
The Economics of Informality Conference 2018
Universidad del Rosario, Bogotá
May 28-29, 2018



Main Idea

- Payroll taxes increase the cost of hiring formal workers
- Hence, substituting payroll taxes by general taxes on corporate profits should have a positive impact on employment and formality

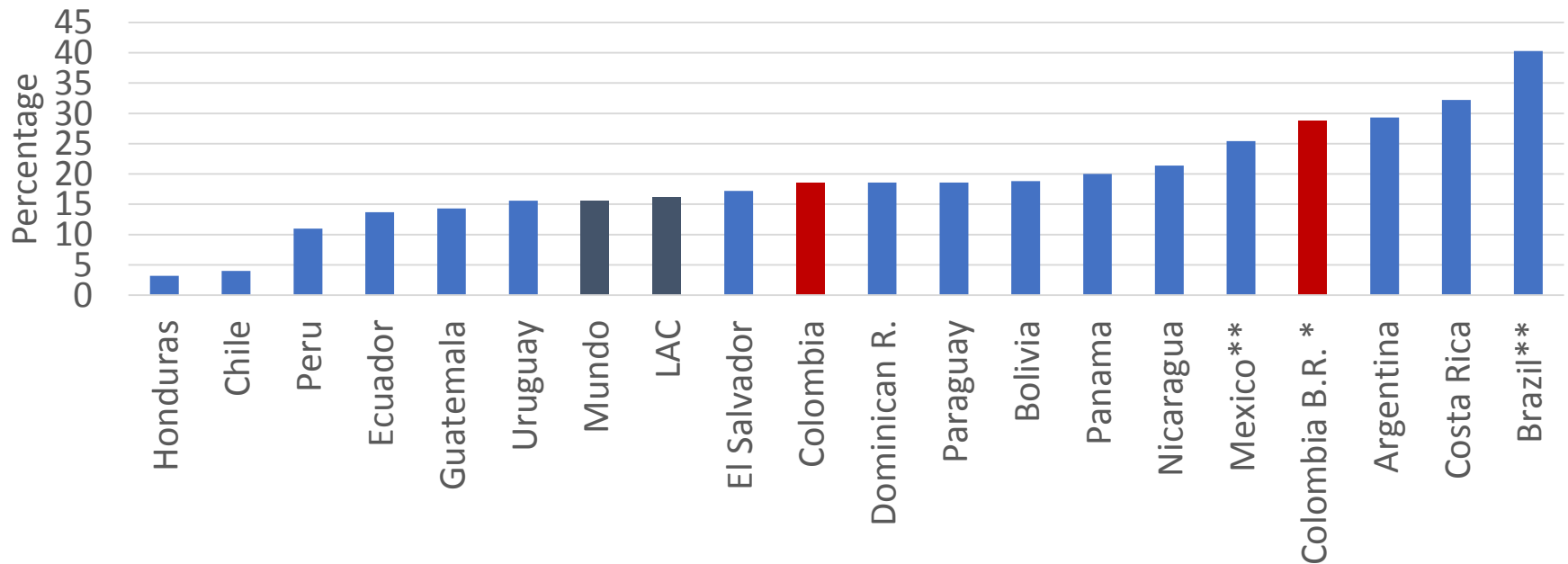
Characteristics of the Colombian 2012 Tax Reform



- Payroll taxes were reduced from 29.5% to 16% of wages
- It only affected contributions made by employers
- Some contributions were not affected:
 - Self employed workers
 - Public sector workers
 - NGOs workers
 - Employers contributions on behalf of workers earning more than 10 minimum wages
- The source of fiscal financing was replaced by a profit tax surcharge (called “CREE”)

Despite the reform, payroll taxes in Colombia remain relatively high by international standards

Labour taxes and contributions, 2015

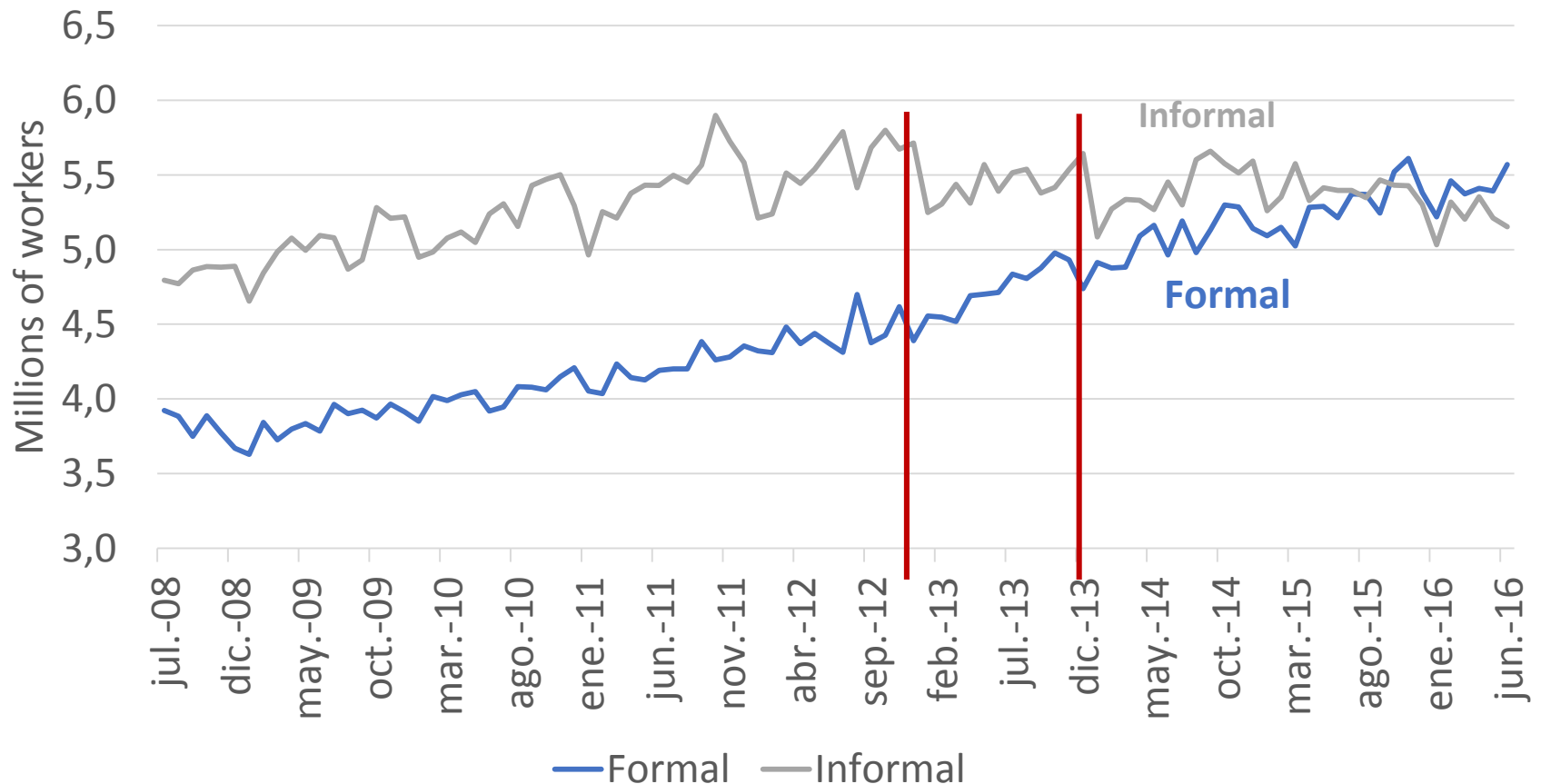


Source: World Bank * Before the Reform

3 HINTS ON THE IMPACT OF THE REFORM

Hint 1: The number of formal informal workers stopped growing, while that of formal workers continued growing

Number of workers in 13 main Colombian cities



Source: Dane GEIH – ECH 13 main metropolitan areas

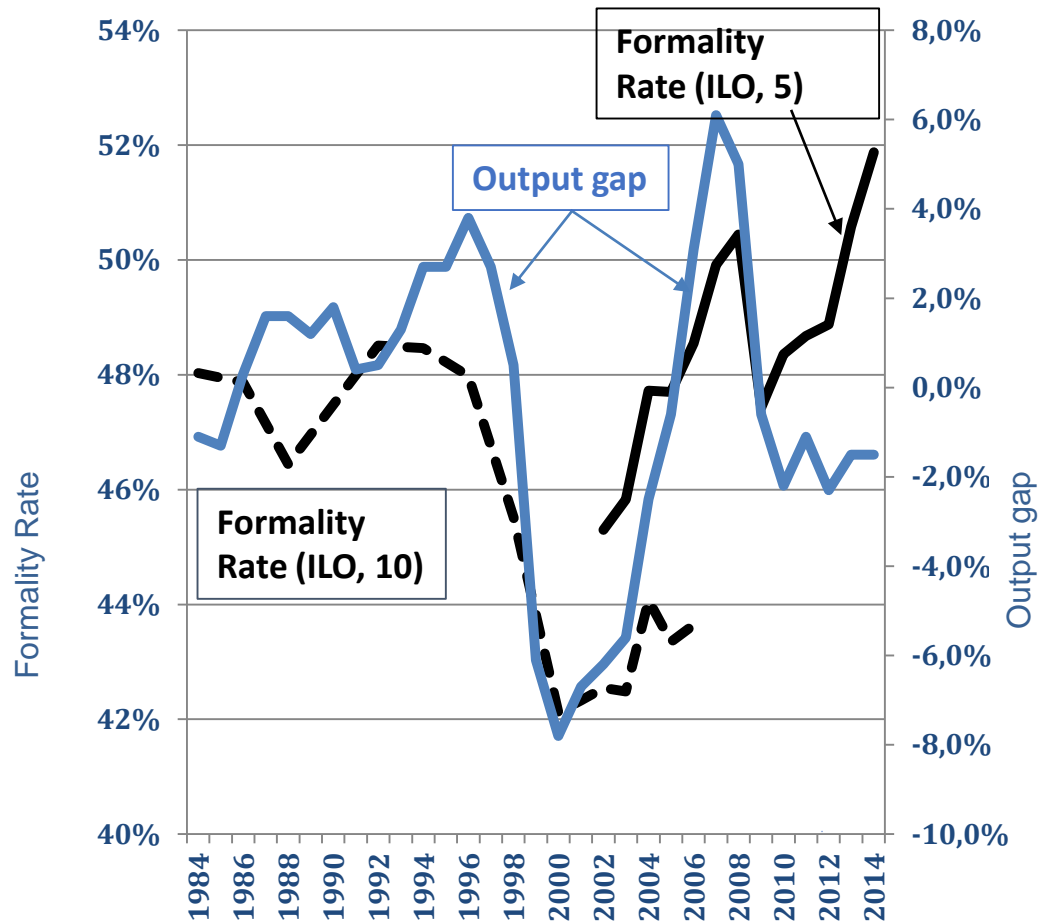
Hint 2: Informality rates of salaried workers declined relative to that of self-employers

Informality rates



Source: Dane GEIH – ECH 13 main metropolitan areas

Hint 3: Change in relationship between formality and the output gap



Formality in Colombia is pro-cyclical, except in the most recent period

Source: DANE - GEIH and Fedesarrollo

A DIF in DIF exercise

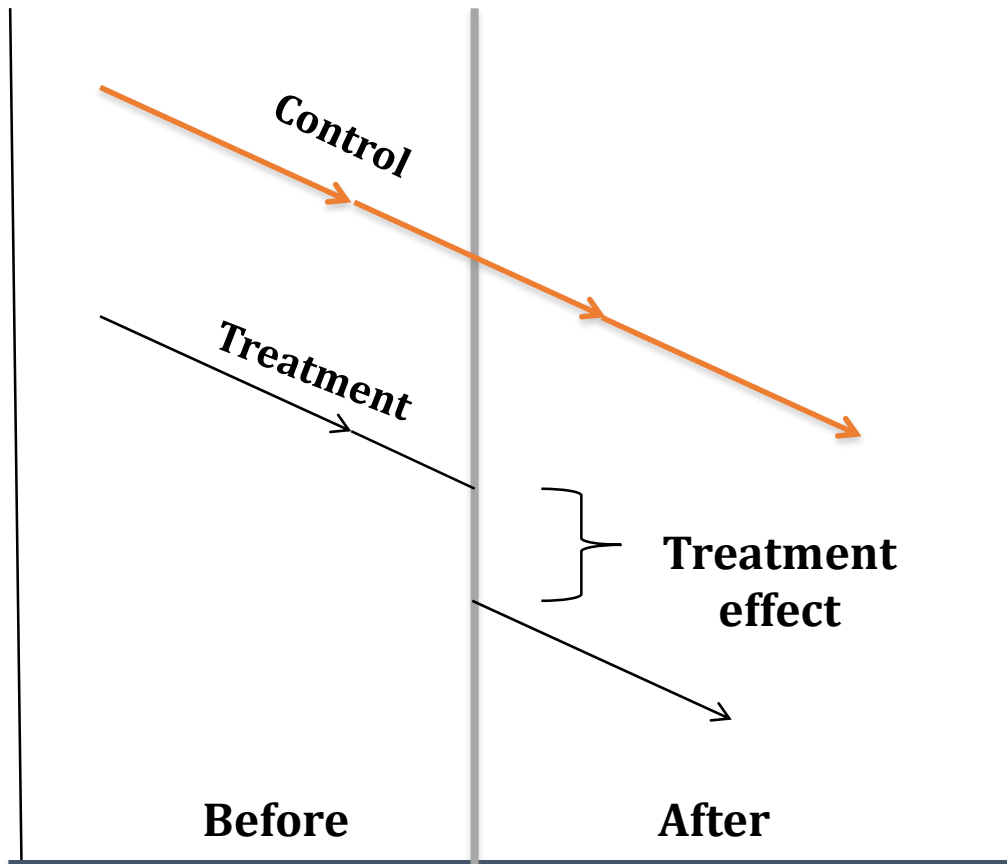
How much of the reduction in informality was due to the reduction in the payroll tax?

Objective

Isolate the impact of other variables affecting informality, such as:

- **GDP Growth**
- **Changes in the Legal Minimum Wage**
- **Other tax changes**, such as the creation of the profit tax surcharge (“CREE”)
- **Changes in the public sector employment** (the public sector share in employment fell down from 3.9% to 3.7%)

Differences in Differences



Purpose:

- To compare the change in the probability of being informal within the group for which payroll taxes were reduced (the treated group) and the change in the probability of being informal in the control group (for which payroll taxes were not reduced)
- Methodology nets out factors that affect both groups (such as growth)

Matching DIF in DIF exercise

Limitations of DID without panel data

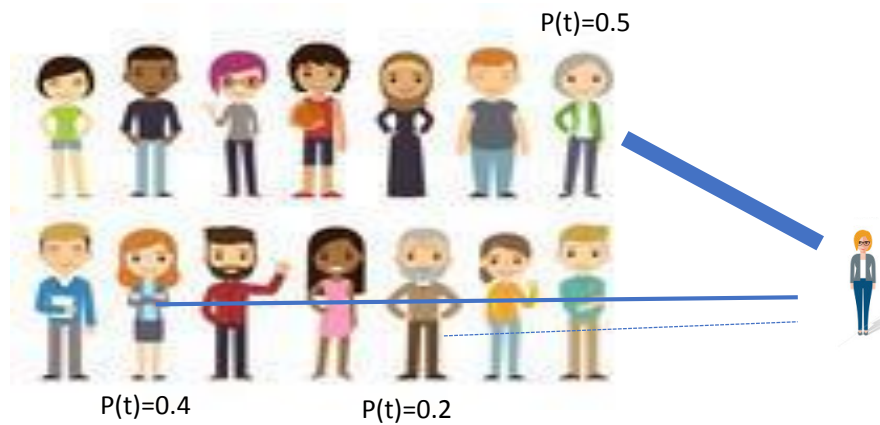
- Assumes common time (macro-economic) effects across groups
- Assumes no changes in group's composition
- It would be ideal to work with panel data, but we don't have those data in Colombia

Matching DID

- MDID (Heckman et al, 1997) – not only simulates a panel but a complete experiment, partially solving both problems.
-

MDID

Treated 2012.



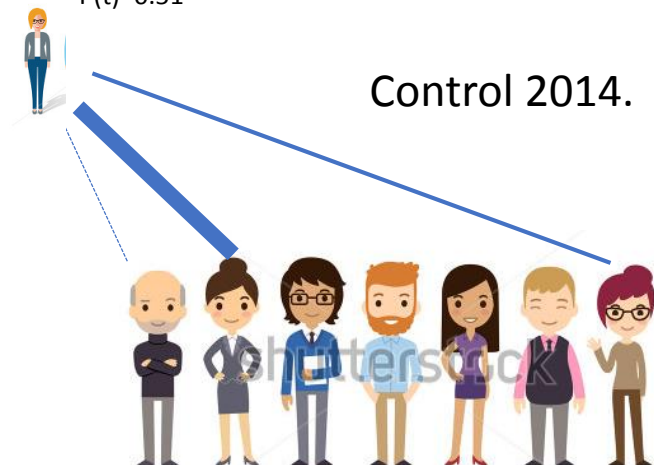
Treated 2014.



Control 2012.



Control 2014.



MDID

Treated 2012.



Treated 2014.



Control 2012.



Control 2012.



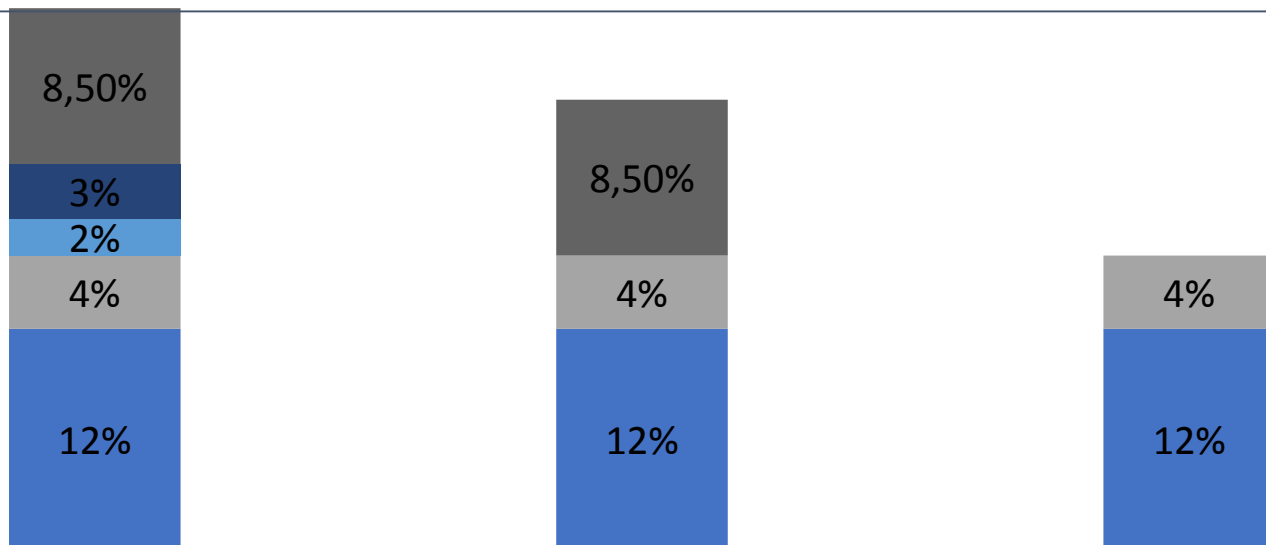
In the case of the Colombian Reform

- **Treatment group** (beneficiaries)
 - Earn between 1 and 10 Legal Minimum Wages
 - Do not work at NGOs or universities
 - Not self-employed
- **Control group** (neutral)
 - Earn less than the minimum wage or more than 10 minimum wages.
 - NGO workers (including universities)
 - Self employed

MDID exercise excluded government workers and workers with no reported income

Period of analysis: 2012 (before) and 2014 (after)

Dates in which payroll taxes were actually reduced



Dec-12

May-13





January 1st 2014

- Pensions (employer)
- Sena
- Health (employer)

- Cajas de Compensacion
- ICBF

RESULTS

MDID (13 main cities)

| | Control | Informality | Treatment | Informality |
|----------------------------|---|-------------|---|--------------|
| Baseline (2012) |  | 71.6% |  | 28.5% |
| Follow Up (2014) |  | 71.3% |  | 23.5% |
| Differences | | -0.3% | | -5% |
| Differences in Differences | | | | -4.7% |
| % treated | | | | 43% |
| Impact of informality rate | | | | -2.1% |

MDID

| | 13 main cities | National | Salaried workers |
|--|----------------|-----------|------------------|
| Control baseline | 0.716 | 0.735 | 0.573 |
| Treated baseline | 0.285 | 0.315 | 0.220 |
| Control follow up | 0.713 | 0.722 | 0.593 |
| Treated follow up | 0.235 | 0.263 | 0.189 |
| MDID- (p.p.) | -4.78*** | -3.97*** | -5.14*** |
| Standard error | (0.00559) | (0.00421) | (0.01430) |
| % treated | 45% | 33% | 78.2 |
| Impact on informality rate (p.p.) | -2.1 | -1.6 | -3.8 |
| R2 | 0.210 | 0.195 | 0.152 |
| No. observations (thousands) | 345,729 | 716,914 | 149,709 |
| Treated population in 2015 (% del total) | 43.0% | 32.4% | 78.2% |

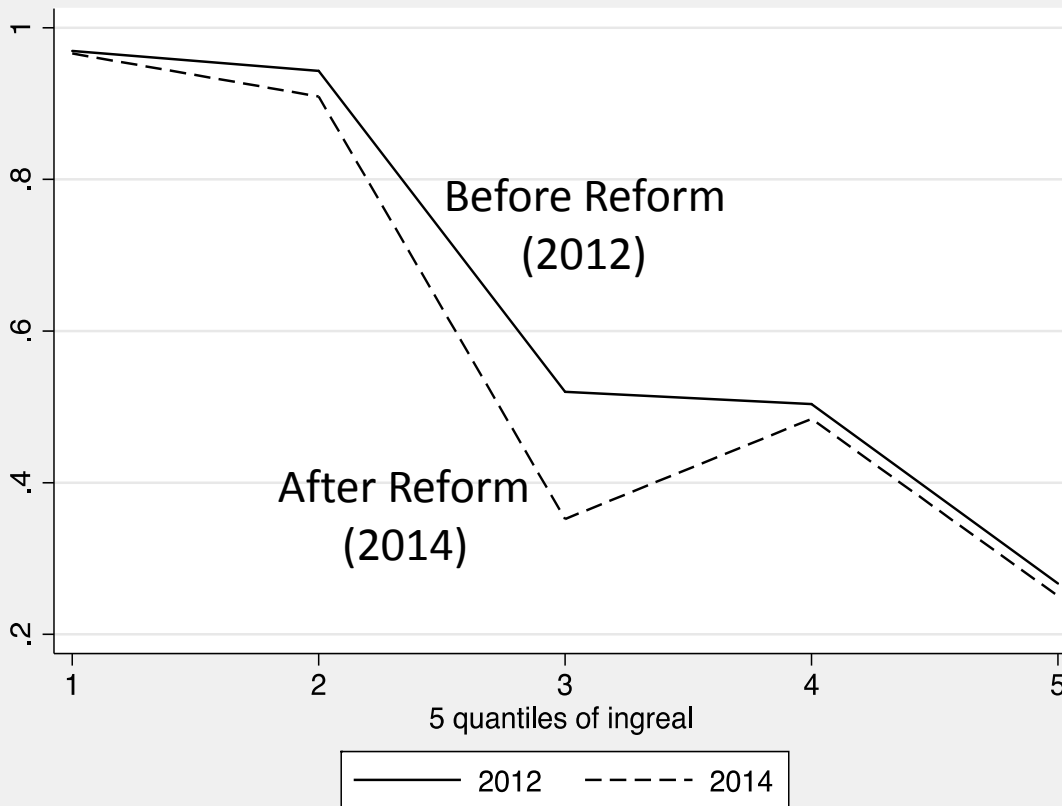
Robustness Tests

- **Common Support:** similar range of p-scores
- **Quality of Matching:** Rubin's criteria hold
- **Placebo Test:** No significant effects found between 2009 and 2012 (years without reform)

Who benefited from the reform

Informality rate by income quintiles

Informality rates, by income quintiles



Informality rate fell more for workers in the third quintile of income.

This is, for workers with wages close to the legal minimum wage (hence more rigid to compensate payroll taxes with wage reductions)

Informality Rates among adults (25-45 years old)

The most favored by the reform were (i) males vs females; (ii) males with income level lower than 2 minimum wages; (iii) males no tertiary education

| Statistic | Gender | | Education | | | Income Level |
|-------------------|-----------|-----------|-------------------------------|-------------------------------|-----------------------------------|----------------------------------|
| | Males | Female | Males, primary school or less | Males, middle and high school | Males, tertiary education or more | Males, less than 2 minimum wages |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| MDiD (p.p) | -5.01*** | -3.10*** | -9.78*** | -7.51*** | -3.16*** | -6.80*** |
| Std. error | (0.00751) | (0.00663) | (0.01570) | (0.01080) | (0.00929) | (0.1000) |
| R-squared | 0.196 | 0.214 | 0.258 | 0.265 | 0.123 | 0.320 |
| N | 109,480 | 102,545 | 20,126 | 54,149 | 35,205 | 81,136 |

*** 99% significance

Conclusions

- The impact of the reduction in payroll taxes of 13,5 pps on the **informality rate of salaried workers** in the main Colombian cities is estimated around **3.8 pps**.
- The impact on the **total informality rate** is estimated in around **2.1 pps**.
- Workers with low levels of education and income levels close to the legal minimum wage were most favored by the reform.



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