

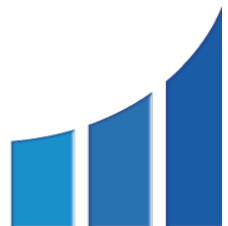
The Impact of Payroll Taxes on Informality. The Case of the 2012 Colombian Tax Reform.

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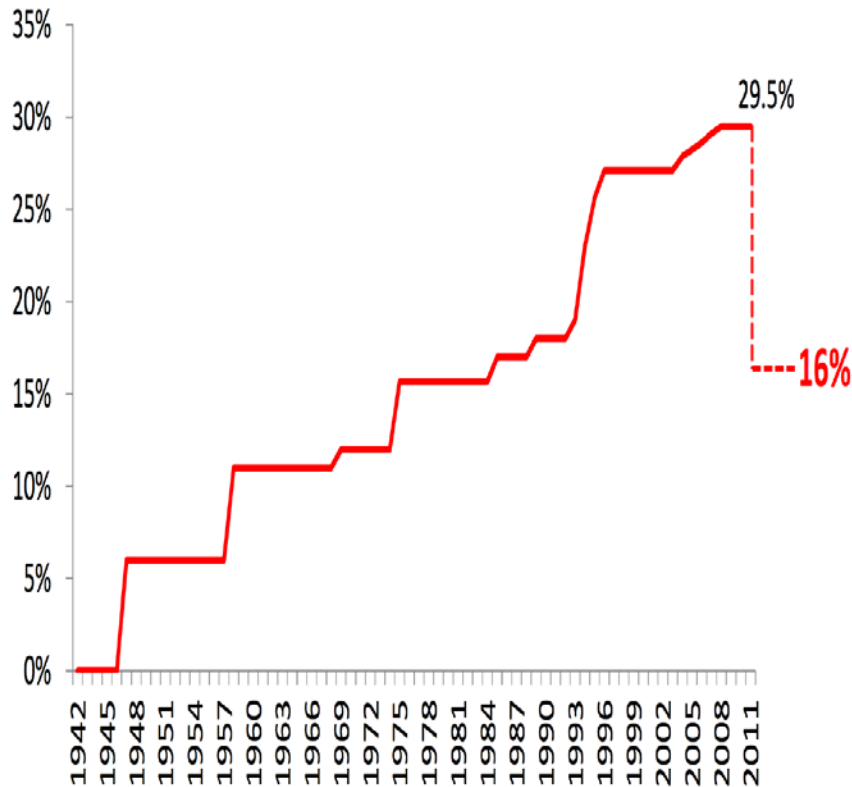
Why this might be of interest to SSA and particularly to South Africa?

- Useful for South Africa in the discussion of increasing its payroll taxes.
- Useful for other countries in Africa that show high payroll taxes as the Cote d'Ivoire, Sudan and Tanzania
- Methodology itself useful in analyzing the impact of labour policies and particularly (but not only) for those countries that do not have household panel data.

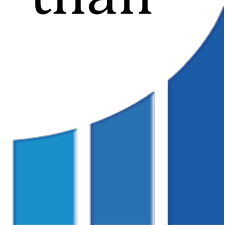


Colombian Reform Characteristics.

Contributions payable by the employer

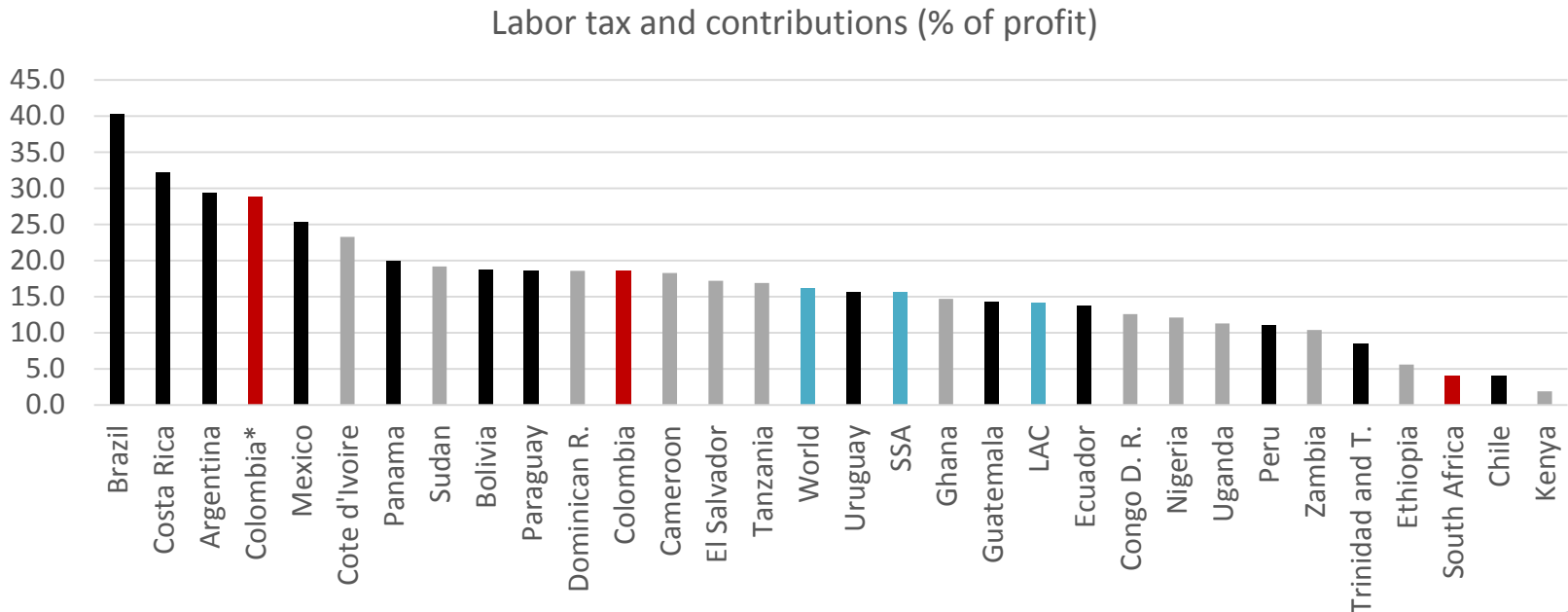


- Reduced payroll taxes from 29.5% to 16% of wages.
- It only affects contributions made by employers and not contributions made by workers.
- The fiscal source of the contributions was replaced by a profit tax under the assumption that it is better to tax the capital than work.

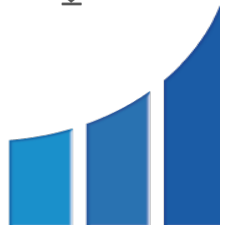


Reform characteristics.

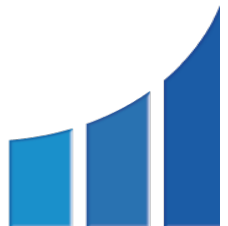
Despite this reduction, payroll taxes remain relatively high at international level.



Source: World Bank * Before the Reform

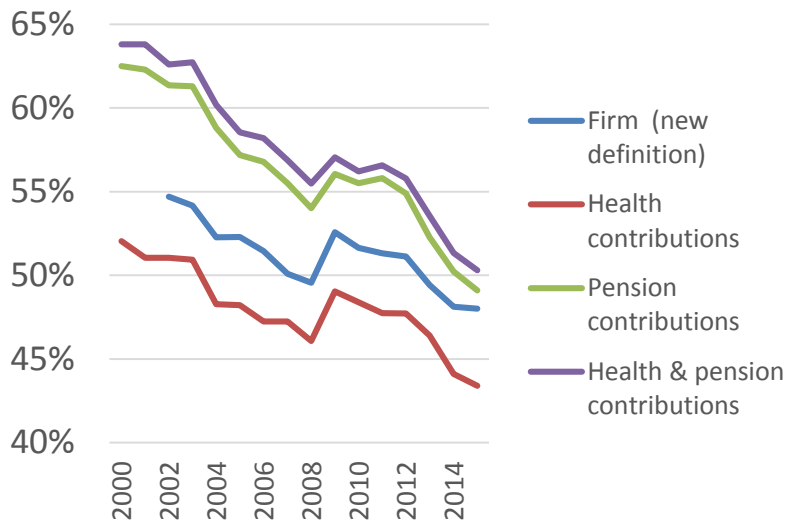


3 HINTS ON THE IMPACT OF THE REFORM

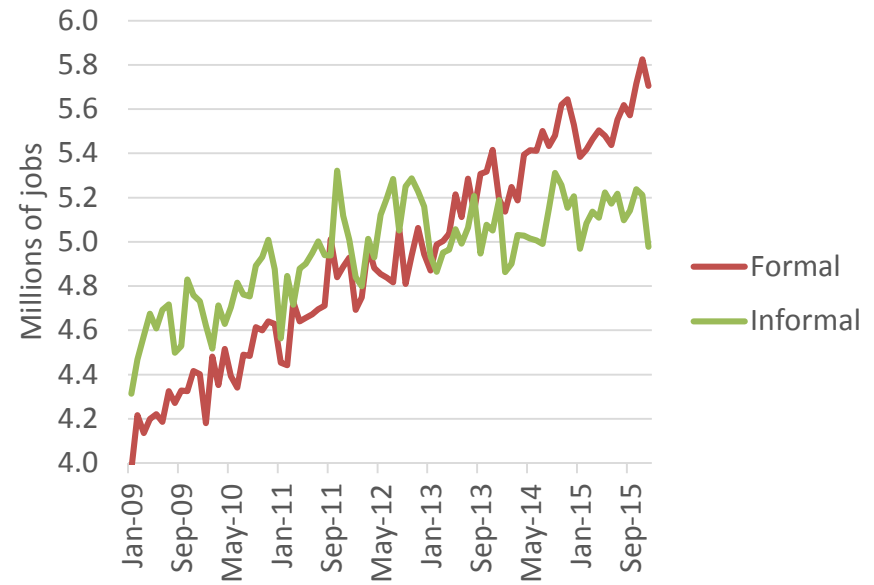


Hint 1: Informality Declined.

Informality rates
Different measurements.



Formal and informal workers.

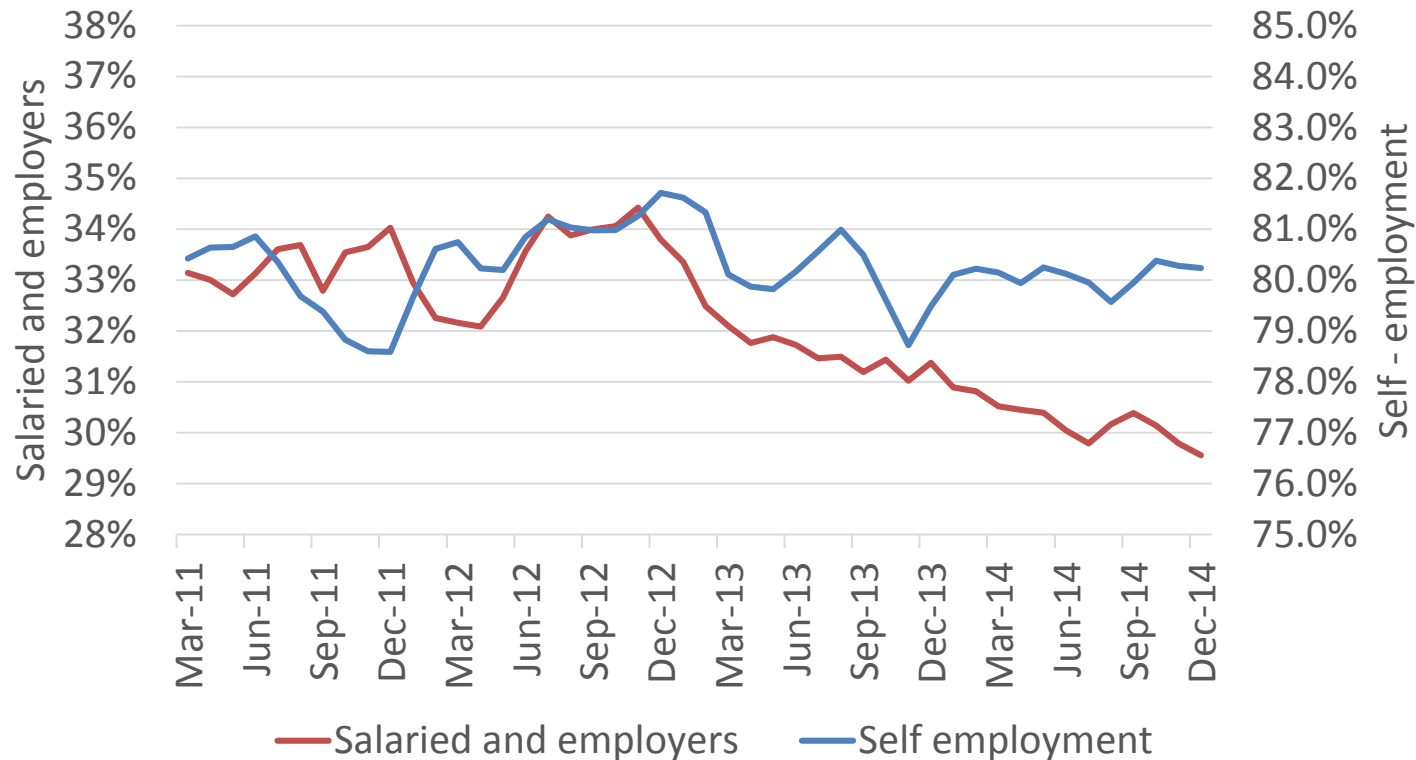


Source: Dane GEIH - ECH 13 main metropolitan areas



Hint 2: Informality rates salaried workers and self-employers.

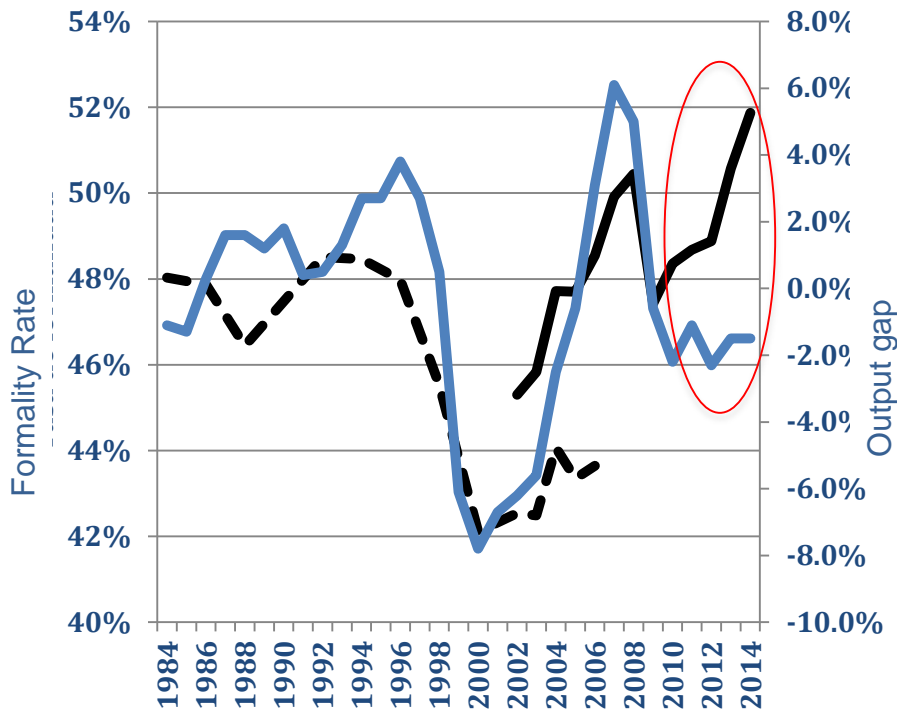
Informality rates: Self employment and other employment



Source: Dane GEIH - ECH 13 main metropolitan areas



Hint 3: Relationship informality - growth

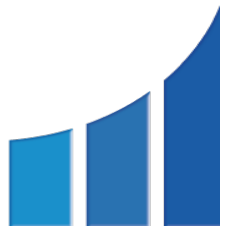


- Formality Rate (OIT, 10).
- Informality Rate (OIT, 5).
- Output Gap

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

| Correlations | |
|--------------|-------------|
| (2002-2013) | (2002-2015) |
| 0.74** | 0.46* |

METHODOLOGY



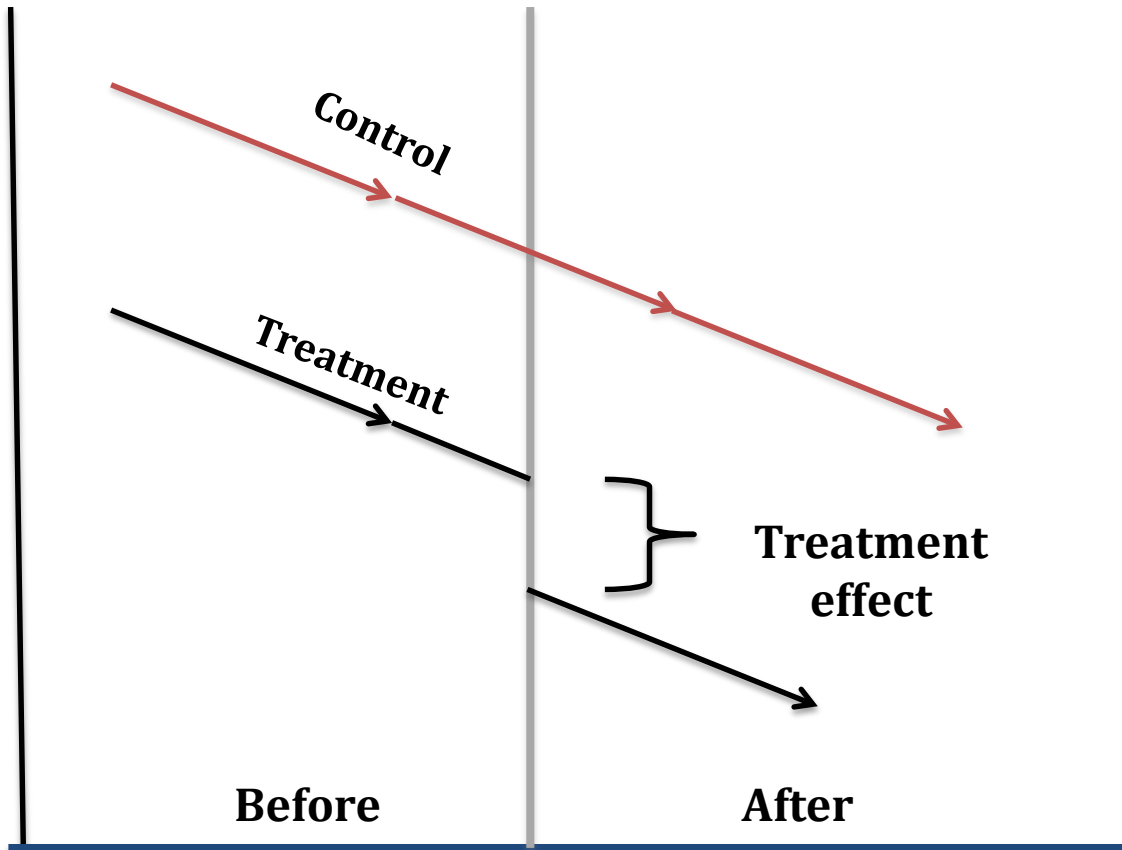
Objective: How much of the reduction in informality was due to the reform

To isolate the impact of other variables affecting informality as:

- **Growth**
- **A general tax increase**, including the creation of the profit tax
- **Increases in the state payroll** (the share fell 3.9% to 3.7%).
- ***The increase in the minimum wage (adjusted by productivity) which increased in 1.8 p.p. per year. (increases informality)***







Differences in Differences.



- It compares the change in the probability of being informally within the control group with the change in the probability of being informal in the treated group.
- Nets factors that simultaneously affects both groups such as growth.



Differences in Differences.

| | Control | cms | Treatment | cms |
|----------------------------|--|-----|--|-----------|
| Baseline |  | 100 |  | 90 |
| Follow up |  | 120 |  | 140 |
| Differences | | 20 | | 50 |
| Differences in Differences | | | | 30 |

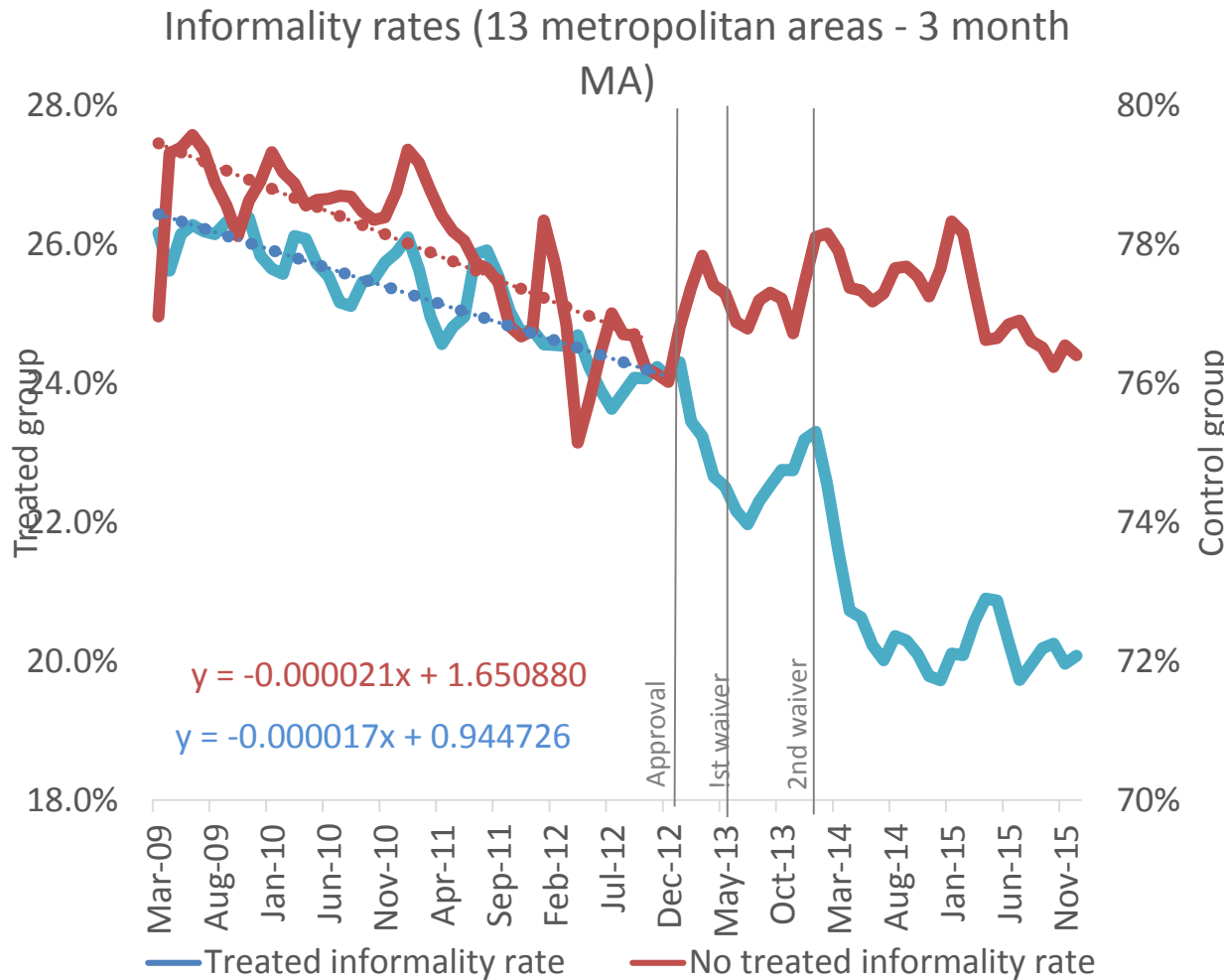
In the case of the Colombian Reform.

- **Treatment group** (beneficiaries)
 - Earn between 1 and 10 salaries.
 - Do not work at universities / NGOs.
 - More than two workers
- **Control group** (neutral)
 - Earn less than the minimum wage or more than 10 minimum wages.
 - University workers / NGOs.
 - Self employment (alternatively excluded)

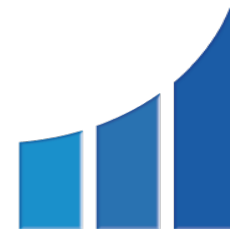
Government and no reported income - excluded



Graphic Analysis.



- Analysis period:
 - 2012 (before the reform)
 - 2014 (after the reform).
- Long moving averages (volatility).



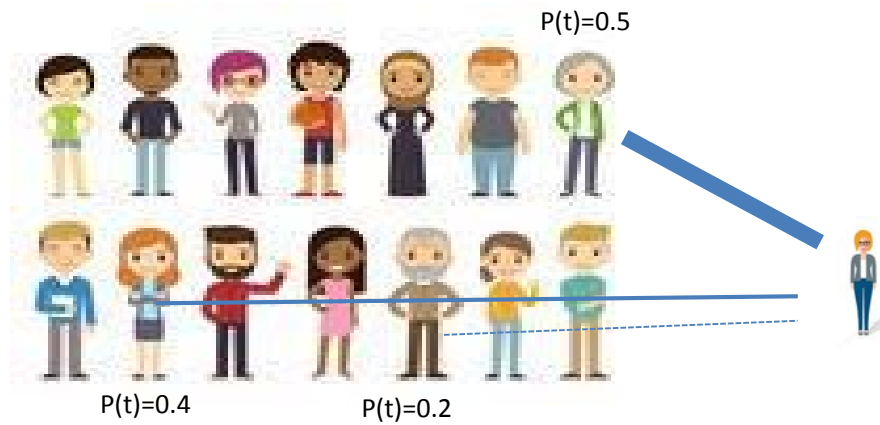
Implementation of the econometric exercise.

If you don't have a panel, create a panel, the model conducting this procedure is called differences in differences with matching developed by Heckman et al (1997).



Matching.

Treatment 2012.



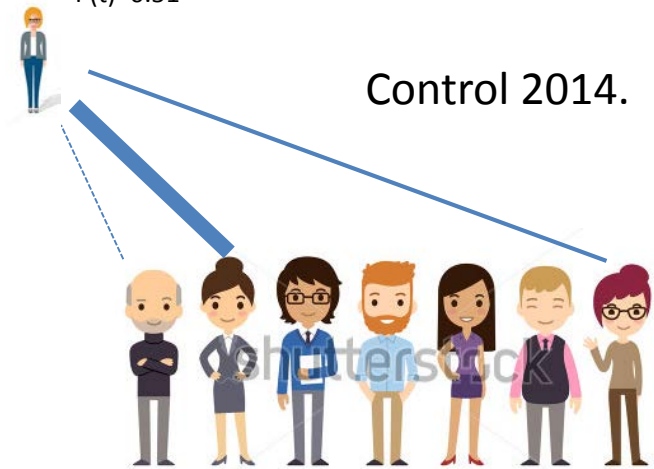
Treatment 2014.



Control 2012.



Control 2014.



Matching.

Treatment 2012.



Treatment 2014.



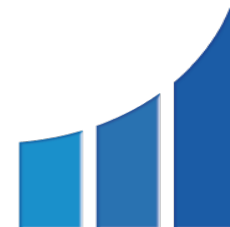
Control 2012.



Control 2012.







RESULTS







Differences in Differences (13 areas).

Including self-employment in the control group

| | Control | Informality | Treatment | Informality |
|----------------------------|---|-------------|---|--------------|
| Baseline (2012) |  | 76% |  | 28% |
| Follow Up (2014) |  | 75% |  | 23% |
| Differences | | -1% | | -5% |
| Differences in Differences | | | | -4.3% |
| % treated | | | | 38% |
| Impact of informality rate | | | | -1.6% |

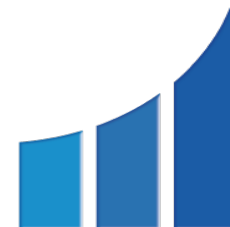
Differences in Differences (13 areas).

Excluding self-employment in the control group

| | Control | Informality | Treatment | Informality |
|----------------------------|---|-------------|---|--------------|
| Baseline (2012) |  | 61% |  | 28% |
| Follow Up (2014) |  | 62% |  | 23% |
| Differences | | 1% | | -5% |
| Differences in Differences | | | | -6.8% |
| % treated | | | | 38% |
| Impact of informality rate | | | | -2.6% |

Robustness Tests.

- **Common Support (similar range of p-scores)**
- **Quality of Matching (Rubin's criteria hold)**
- **Placebo Test (2009-2012: no significant)**

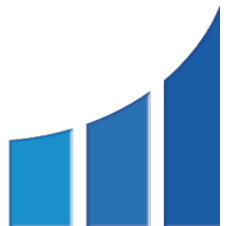


Results of past exercises.

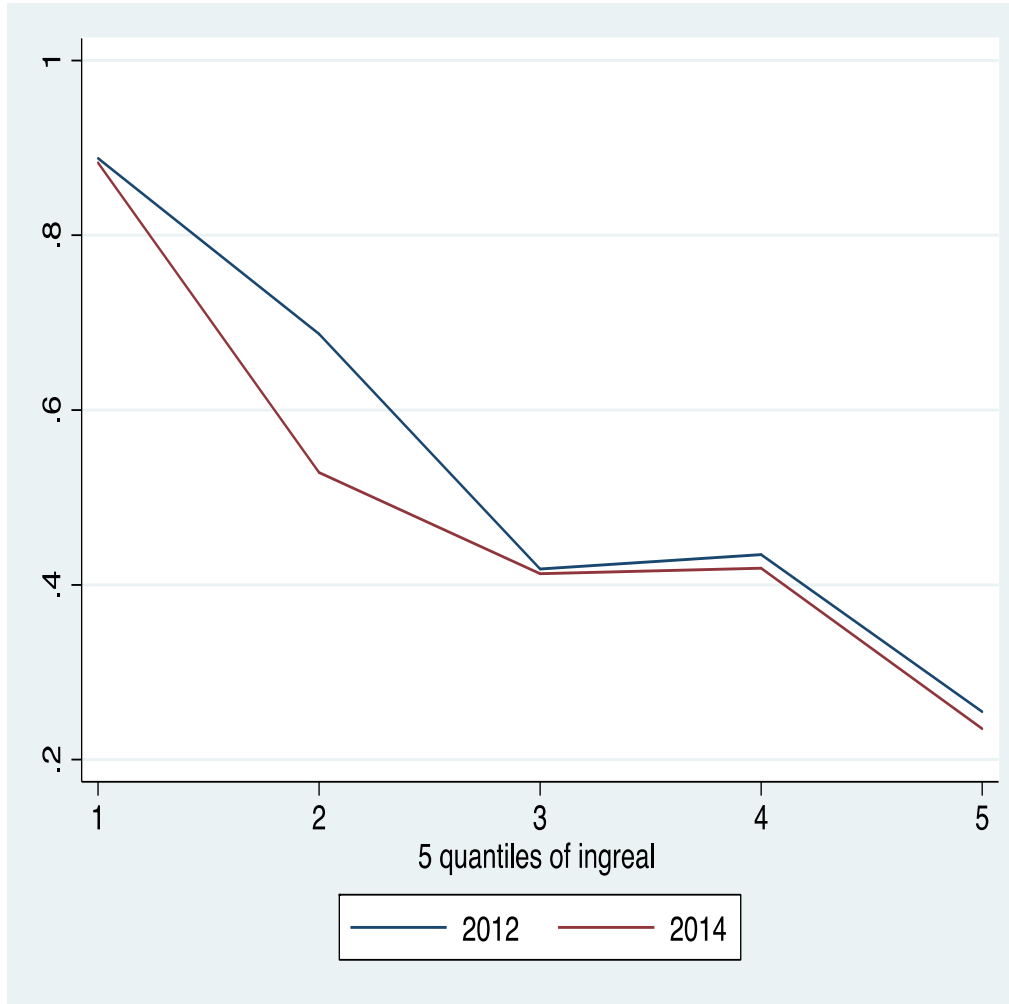
- **Anton (2014)**, the recent reform reduced the rate of informality between 2.9 p.p. and 3.4 p.p. Theoretical model.
- **Kugler and Kugler (2009)**, an increase of 10 % in payroll taxes reduces formal employment between 4% and 5 %.
- **Mondragón et al (2010)**, a 10% increase in payroll contributions increases the probability of being informal between 5 % and 8%.
- More recent work on the impact of recent reforms show that the number of formal workers increased between 3.1 and 3.4 p.p. **(IDB)** and 1 p.p 2014 , 2 p.p. for 2016 and 5.6 p.p. 2018 **(Central Bank-preliminar)** .



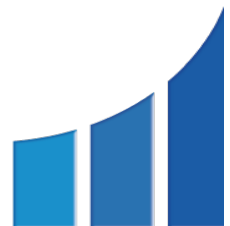
DISTRIBUTION EFFECT



Informality rate by income quintiles.



They benefit more those who receive similar income to a minimum because a restriction carving more at this point where wages are not flexible downward shifted.



MDID by economic sector. Including self-employment

| | Baseline (2012) | | Follow Up (2014) | | DID |
|---|-----------------|-----------|------------------|-----------|--------------|
| | Control | Treatment | Control | Treatment | |
| Low Educated (Primary or less) | 92% | 49% | 92% | 39% | -10.4% |
| High school | 56% | 25% | 66% | 22% | -13% |
| Tertiary education or higher | 56% | 14% | 54% | 11% | -1.2% (n.s.) |
| Male 25-45 years | 75% | 26% | 75% | 21% | -5% |

Source: Own calculations, based on GEIH 2007-2015 *Male 25 – 45 years * Not significant. All the other results are significant 99%.

- Students with high-school education or less were most favored by the reform.



Conclusions.

- The 13.5 points reduction in payroll taxes decreased the informality rate in Colombia in between 4.3 and 6.8 p.p. that impacted the informality rate in between 1.6 and 2.6 points.
- Men in productive years with low levels of education (high school or less) were most favored by the reform.

