Impacto de la estrategia de participación forzosa en la erradicación de cultivos ilícitos

** ESTIMACIÓN DEL IMPACTO DE LA ESTRATEGIA FORZOSA

**

Convenciones:

- **D_for**: Variable de tratamiento
- **pnn**: parques nacionales naturales
- **part_ilicitos**: participación de los cultivos ilícitos con respecto al área total de la UPAC
- **part_mixtos**: participación de los cultivos mixtos con respecto al área total de la UPAC

Variables relevantes:

- Global X "plantas_coca  distancia1_0  distancia2  dias_aplicacion  superficie_total  cada_cuantos_cosecha_0  tipo_cultivo  cada_cuantos_cosecha_1  metodo_sie  arrobas_raspa_0  area_cosechada_e  densidadplan_3  p13a  p15_a_os_2  p51_precio  p19_persona_trab  ajan"

Prueba para determinar que las variables son significativas:

```
dprobit D_for $X
```

Iteration 0:  log likelihood =  -184.11834  
Iteration 1:  log likelihood =  -122.42597  
Iteration 2:  log likelihood =  -105.87283  
Iteration 3:  log likelihood =  -97.923748  
Iteration 4:  log likelihood =  -95.368164  
Iteration 5:  log likelihood =  -95.101657  
Iteration 6:  log likelihood =  -95.097695  
Iteration 7:  log likelihood =  -95.097693  

Probit regression, reporting marginal effects  

```
Number of obs =  686  
LR chi2(12)    =  178.04  
Prob > chi2    =  0.0000  
Log likelihood =  -95.097693   
Pseudo R2      =  0.4835  
```

```
------------------------------------------------------------------
 D_for |    dF/dx   Std. Err.      z    P>|z|     x-bar  [    95% C.I.   ]
---------+------------------------------------------------------------
 planta-a |  -4.39e-07   5.09e-07    -6.63   0.000   6897.51  -1.4e-06  5.6e-07
 d_0_d-2 |  -.0192522   .0234852    -3.98   0.000   1.00055  -.065282  .026778
 dias_a-n |  -.0000485    .000056    -5.49   0.000   61.3338  -.000158  .000061
 superf-l |   .0000955   .0001082     2.35   0.019   9.17493  -.000117  .000307
 cada_c-i |  -.0000423     .00005    -5.99   0.000   75.7872  -.000211  .000061
 cada_c-e |  -.0000641   .0000747    -3.78   0.000   37.6676  -.000158  .000061
 arrobas_e |   .0001883   .0002069     2.80   0.005   4.42492  -.000217  .000594
 densid-3 |   7.63e-16   9.23e-16     2.07   0.038   9.6e+11  -1.0e-15  2.6e-15
 p13a   |   .0005628   .0007596     1.75   0.080   2.27697  -.000926  .002052
------------------------------------------------------------------
```
Impacto de la estrategia de participación forzosa en la erradicación de cultivos ilícitos

Prueba de relevancia de instrumento:

una estimación por MCO, la prueba canónica de Anderson, la prueba de Cragg-Donald y la prueba de Stock y Yoko.

*Regresión MCO

**Para las regresiones el valor del estadistico F debe ser mayor a 10 para asegurar que el instrumento es relevante.

reg D_for $X pnn

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>Number of obs = 686</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>11.87</td>
<td>13</td>
<td>.9132</td>
<td>F(9, 672) = 16.96</td>
</tr>
<tr>
<td>Residual</td>
<td>36.19</td>
<td>672</td>
<td>.0538</td>
<td>Prob &gt; F = 0.0000</td>
</tr>
<tr>
<td>Total</td>
<td>48.06</td>
<td>685</td>
<td>.0702</td>
<td>R-squared = 0.2470</td>
</tr>
</tbody>
</table>

| D_for | Coef.  | Std. Err. | t    | P>|t| |
|-------|--------|-----------|------|------|
| plantas_coca | -0.0000184 | 0.0000068 | -2.71 | 0.006 |
| distancia1 0_distancia2 | -1.731553 | 0.533557 | -3.27 | 0.001 |
| dias_aplicacion | -0.002516 | 0.000443 | -5.67 | 0.000 |
| superficie_total | -0.003404 | 0.002117 | -1.61 | 0.109 |
| cada_cuanto_cosecha 0_tipo_culti | -0.00361 | 0.000425 | -8.49 | 0.000 |
| cada_cuanto_cosecha 0_metodo_sie | -0.002258 | 0.001127 | -2.00 | 0.045 |
| arrobas_raspa 0_area_cosechada_e | -0.002998 | 0.002578 | -1.16 | 0.245 |
| densidadplan_3 | 3.1615 | 1.2514 | 2.52 | 0.012 |
| p13a | 0.0168 | 0.017664 | 0.95 | 0.341 |
Impacto de la estrategia de participación forzosa en la erradicación de cultivos ilícitos

-0.0178575 0.0515128
p15_a_os_2 | -2.90e-06 0.000149 -0.19 0.846
-0.0000322 0.0000264
p51_precio | -1.30e-06 9.75e-07 -1.33 0.184
-3.21e-06 6.16e-07
p19_persona_trabajan | -.025598 0.0118519 -2.16 0.031
-0.0488692 -.0023269
pnn | -.001781 0.0002762 -6.45 0.000
-0.0023233 -.0012387
_cons | 3.494182 0.5371639 6.50 0.000
2.439461 4.548904

El valor del estadístico F es 16.96. Según Stock y Watson pg. 443, (2.007), si el estadístico F es superior a diez, se puede asegurar que el instrumento es relevante.

A partir de lo anterior vemos que la distancia sí puede ser un buen predictor de la variable de participación "D_for".

*Pruebas: canónica de Anderson / Cragg-Donald / Stock y Yoko

ivreg2 part_ilicitos $X (D_for=pnn)

IV (2SLS) estimation

Estimates efficient for homoskedasticity only
Statistics consistent for homoskedasticity only

|         | Coef.   | Std. Err. | z     | P>|z| |
|---------|---------|-----------|-------|-------|
|part_ilicitos |         |           |       |       |
|[95% Conf. Interval] |

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>D_for</td>
<td>-0.1285422</td>
<td>0.0430641</td>
<td>-2.98</td>
<td>0.003</td>
</tr>
<tr>
<td>plantas_coca</td>
<td>8.33e-06</td>
<td>1.26e-06</td>
<td>6.59</td>
<td>0.000</td>
</tr>
<tr>
<td>distancia1 0_distancia2</td>
<td>-3.013023</td>
<td>.17742</td>
<td>-1.70</td>
<td>0.089</td>
</tr>
<tr>
<td>dias_aplicacion</td>
<td>.000093</td>
<td>.0001425</td>
<td>0.65</td>
<td>0.514</td>
</tr>
<tr>
<td>superficie_total</td>
<td>-.006364</td>
<td>.0005761</td>
<td>-11.05</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Página 3
Impacto de la estrategia de participación forzosa en la erradicación de cultivos ilícitos

La variable es relevante con respecto a la participación de los cultivos ilícitos.

ivreg2 part_mixtos $X (D_for=pnn)

IV (2SLS) estimation

Estimates efficient for homoskedasticity only
Statistics consistent for homoskedasticity only
Impacto de la estrategia de participación forzosa en la erradicación de cultivos ilícitos

| [95% Conf. Interval] | part_mixtos | Coef. | Std. Err. | z    | P>|z| |
|----------------------|----------------|-------|-----------|------|------|
|                      | D_for | -0.0891663 | 0.0432507 | -2.06 | 0.039 |
|                      | plantas_coca | -5.10e-07 | 1.27e-06 | -0.40 | 0.688 |
|                      | distancia1_0_distancia2 | -1.699628 | 0.1781889 | -0.95 | 0.340 |
|                      | dias_aplicacion | -0.00517 | 0.001431 | -3.61 | 0.000 |
|                      | superficie_total | -0.0038295 | 0.0005786 | -6.62 | 0.000 |
|                      | arrobas_raspa_0_area_cosechada_e | -0.0017405 | 0.0006911 | -2.52 | 0.012 |
|                      | densidadplan_3 | -1.50e-14 | 3.60e-15 | -4.16 | 0.000 |
|                      | p13a | 0.0098075 | 0.0051248 | 1.91 | 0.056 |
|                      | p15_a_os_2 | 0.0000129 | 4.12e-06 | 3.12 | 0.002 |
|                      | p51_precio | -0.0050975 | 0.003405 | -1.50 | 0.134 |
|                      | p19_persona_trabajan | -0.0050975 | 0.003405 | -1.50 | 0.134 |
|                      | cons | 0.608223 | 0.224747 | 2.71 | 0.007 |

Underidentification test (Anderson canon. corr. LM statistic): 39.970
Chi-sq(1) P-val = 0.0000

Weak identification test (Cragg-Donald Wald F statistic): 41.577
Stock-Yogo weak ID test critical values: 10% maximal IV size 16.38
15% maximal IV size 8.96
20% maximal IV size 6.66
25% maximal IV size 5.53

Impacto de la estrategia de participación forzosa en la erradicación de cultivos ilícitos

Sargan statistic (overidentification test of all instruments): 0.000
(equation exactly identified)

Instrumented: D_for
Included instruments: plantas_coca distancia1_0_distancia2 dias_aplicacion superficie_total cada_cuanto_cosecha_0_tipo_culti cada_cuanto_cosecha_0_metodo_sie arrobas_raspa_0_area_cosechada_e densidadplan_3 p13a p15_a_os_2 p51_precio p19_persona_trabajan
Excluded instruments: pnn

La variable es relevante con respecto a la participación de los cultivos mixtos.

***** Prueba de exogeneidad

Según Bernal et al (2011) se sugiere predecir los errores de MCO y verificar que estos no estén relacionados con el instrumento

*Participación de los cultivos ilícitos

reg part_ilicitos D_for $X

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>Number of obs = 686</th>
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</thead>
<tbody>
<tr>
<td>Model</td>
<td>3.08251982</td>
<td>13</td>
<td>.237116909</td>
<td>F(13, 672) = 67.21</td>
</tr>
<tr>
<td>Residual</td>
<td>2.37076342</td>
<td>672</td>
<td>.003527922</td>
<td>Prob &gt; F = .0000</td>
</tr>
<tr>
<td>Total</td>
<td>5.45328324</td>
<td>685</td>
<td>.007960997</td>
<td>R-squared = 0.5653</td>
</tr>
</tbody>
</table>

| part_ilicitos | Coef. | Std. Err. | t    | P>|t| |
|---------------|-------|-----------|------|-----|
| D_for         | .0170612 | .0095818 | -1.78 | .075 |
| plantas_coca  | .0000108 | 7.84e-07 | 13.79 | .000 |
| distancia1_0_distancia2 | -.0392025 | .1361747 | -0.29 | .774 |
| dias_aplicacion | .0002949 | .0001113 | 2.65 | .008 |
| superficie_total | -.0062978 | .0005305 | -11.87 | .000 |
| cada_cuanto_cosecha_0_tipo_culti | .0023164 | .0001085 | 21.34 | .000 |
Impacto de la estrategia de participación forzosa en la erradicación de cultivos ilícitos

cada_cuanto_cosecha_0_metodo_sie | .00008925 .0002783 3.21 0.001
arrobas_raspa_0_area_cosechada_e | .0010529 .006294 1.67 0.095
-.000183 .0022889
densidadplan_3 | 7.64e-15 3.20e-15 2.39 0.017
1.37e-15 1.39e-14 p13a | -.0121999 .0044428 -2.75 0.006
-.0209234 -.0034764 p15_a_os_2 | 2.68e-06 3.55e-06 0.75 0.451
-4.29e-06 9.66e-06 p51_precio | 1.18e-06 2.42e-07 4.86 0.000
7.01e-07 1.65e-06 p19_persona_trabajan | -.0073315 .0030307 -2.42 0.016
-.0132823 -.0013806 _cons | -.1162337 .1415767 -0.82 0.412
-.3942196 .1617521

Según los resultados, la variable instrumental es exogena con respecto a la participación de los cultivos ilícitos.

*Participación de los cultivos mixtos

reg part_mixtos D_for $X

predict uhat, residuals
reg uhat pnn

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
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<th>MS</th>
<th>Number of obs = 686</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F( 1, 684) = 2.90</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model</td>
<td>.010013866 1 .010013866 Prob &gt; F = 0.0890</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residual</td>
<td>2.36074953 684 .003451388 R-squared = 0.0042</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2.37076339 685 .003460968 Root MSE = .05875</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| uhat | Coef. | Std. Err. | t     | P>|t| | [95% Conf. Interval] |
|------|-------|-----------|-------|------|----------------------|
| pnn  | .0000715 .0000419 1.70 0.089 -.0000109 .0001538 |
| _cons | -.0065453 .0044494 -1.47 0.142 -.0152814 .0021907 |

Según los resultados, la variable instrumental es exogena con respecto a la participación de los cultivos ilícitos.

*Participación de los cultivos mixtos

reg part_mixtos D_for $X

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>Number of obs = 686</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F( 13, 672) = 106.39</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model</td>
<td>5.0243462 13 .386488169 Prob &gt; F = 0.0000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residual</td>
<td>2.44130566 672 .003632895 R-squared = 0.6730</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>7.46565186 685 .010898762 Root MSE = .06027</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Impacto de la estrategia de participación forzosa en la erradicación de cultivos ilícitos**

| part_mixtos | Coef.     | Std. Err. |     t  | P>|t|   | [95% Conf. Interval] |
|-------------|-----------|-----------|--------|-------|-------------------|
| D_for       | 0.0168345 | 0.0097233 | 1.73   | 0.084 |                   |
| plantas_coca| 1.86e-06  | 7.96e-07  | 2.34   | 0.020 |                   |
| distancia1_0_distancia2 | 0.0792524 | 1.381858  | 0.57   | 0.566 |                   |
| dias_aplicacion | -0.003251 | 0.00113   | -2.88  | 0.004 |                   |
| superficie_total | -0.0037665 | 0.005384  | -7.00  | 0.000 |                   |
| cada_cuanto_cosecha_0_tipo_culti | -0.0028043 | 0.001101  | -25.46 | 0.000 |                   |
| cada_cuanto_cosecha_0_metodo_sie | 0.0011858 | 0.0002824 | 4.20   | 0.000 |                   |
| arrobas_raspa_0_area_cosechada_e | -0.0019559 | 0.0006387 | -3.06  | 0.002 |                   |
| densidadplan_3 | -1.74e-14 | 3.24e-15  | -5.35  | 0.000 |                   |
| p13a | 0.0055583 | 0.0045085 | 1.23   | 0.218 |                   |
| p15_a_os_2 | 9.30e-06  | 3.61e-06  | 2.58   | 0.010 |                   |
| p51_precio | -5.71e-07 | 2.46e-07  | 2.32   | 0.021 |                   |
| p19_persona_trabajan | -0.0029998 | 0.0030755 | -0.98  | 0.330 |                   |
| _cons | 0.0055583 | 0.0045085 | 1.23   | 0.218 |                   |

predict uhat, residuals
reg uhat pnn

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>Number of obs = 686</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>0.009053518</td>
<td>1</td>
<td>0.009053518</td>
<td>F( 1, 684) = 2.55</td>
</tr>
<tr>
<td>Residual</td>
<td>2.43225211</td>
<td>684</td>
<td>0.003555924</td>
<td>Prob &gt; F = 0.1110</td>
</tr>
<tr>
<td>Total</td>
<td>2.44130563</td>
<td>685</td>
<td>0.00356395</td>
<td>R-squared = 0.0037</td>
</tr>
</tbody>
</table>

Adj R-squared = 0.0023
Root MSE = 0.05963

| uhat | Coef.   | Std. Err. |     t  | P>|t|   | [95% Conf. Interval] |
|------|---------|-----------|--------|-------|-------------------|
| pnn  | 0.000679 | 0.0000426 | 1.60   | 0.111 | -.0000157        | 0.0001515    |
| _cons | -0.0062235 | 0.0045162 | -1.38  | 0.169 | -.0150909        | 0.0026438    |
Impacto de la estrategia de participación forzosa en la erradicación de cultivos ilícitos

Según los resultados, la variable instrumental es exógena con respecto a la participación de los cultivos ilícitos.

** Estimación del impacto

*Estimacion del Impacto por MC2E con respecto a los cultivos ilícitos*

```
ivreg2 part_ilicitos $X (D_for= pnn), first
```

First-stage regressions

First-stage regression of D_for:

Statistics consistent for homoskedasticity only
Number of obs = 686

```
|                | Coef.  | Std. Err.  | t    |  P>|t| |
|----------------|--------|------------|------|-----|
| pnn            | -.001781 | .0002762   | -6.45 | 0.000 |
| plantas_coca   | -.0000184 | 3.01e-06   | -6.11 | 0.000 |
| distancia1_0_distancia2 | -1.715013 | .533819   | -3.21 | 0.001 |
| dias_aplicacion | -.0025156 | .0004434  | -5.67 | 0.000 |
| superficie_total | -.0034036 | .0021179  | -1.61 | 0.109 |
| cada_cuanto_cosecha_0_tipo_culti | -.003608 | .0004248 | -8.49 | 0.000 |
| cada_cuanto_cosecha_0_metodo_sie | -.0022588 | .001127  | -2.00 | 0.045 |
| arrobas_raspa_0_area_cosechada_e | -.0029981 | .0025788 | -1.16 | 0.245 |
| densidadplan_3 | 3.16e-14 | 7.00e-15   | 2.52  | 0.012 |
| p19_persona_trabajan | -.025598 | .0118519 | -2.16 | 0.031 |
```

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Impacto de la estrategia de participación forzosa en la erradicación de cultivos ilícitos

-.0488692   -.0023269
_cons | 3.494182   .5371639   6.50   0.000
2.439461   4.548904

-----------------------
F test of excluded instruments:
F(  1,   672) =    41.58  
Prob > F =   0.0000

Sanderson-Windmeijer multivariate F test of excluded instruments:
F(  1,   672) =    41.58  
Prob > F =   0.0000

Summary results for first-stage regressions

<table>
<thead>
<tr>
<th>Variable</th>
<th>F(  1,   672)</th>
<th>P-val</th>
<th>SW Chi-sq(  1)</th>
<th>P-val</th>
<th>SW F(  1,   672)</th>
</tr>
</thead>
<tbody>
<tr>
<td>D_for</td>
<td>41.58</td>
<td>0.0000</td>
<td>42.44</td>
<td>0.0000</td>
<td>41.58</td>
</tr>
</tbody>
</table>

Stock-Yogo weak ID F test critical values for single endogenous regressor:
- 10% maximal IV size: 16.38
- 15% maximal IV size: 8.96
- 20% maximal IV size: 6.66
- 25% maximal IV size: 5.53


NB: Critical values are for Sanderson-Windmeijer F statistic.

Underidentification test
Ho: matrix of reduced form coefficients has rank=K1-1 (underidentified)
Ha: matrix has rank=K1 (identified)
Anderson canon. corr. LM statistic 
Chi-sq(1)=39.97  P-val=0.0000

Weak identification test
Ho: equation is weakly identified
Cragg-Donald Wald F statistic
41.58

Stock-Yogo weak ID test critical values for K1=1 and L1=1:
- 10% maximal IV size: 16.38
- 15% maximal IV size: 8.96
- 20% maximal IV size: 6.66
- 25% maximal IV size: 5.53


Weak-instrument-robust inference
Tests of joint significance of endogenous regressors B1 in main equation
Ho: B1=0 and orthogonality conditions are valid
Anderson-Rubin Wald test F(1,672)= 10.60  P-val=0.0012
Anderson-Rubin Wald test Chi-sq(1)= 10.82  P-val=0.0010
Stock-Wright LM S statistic Chi-sq(1)= 10.65  P-val=0.0011

Number of observations N = 686

Página 10
Impacto de la estrategia de participación forzosa en la erradicación de cultivos ilícitos

Number of regressors \( K = 14 \)
Number of endogenous regressors \( K_1 = 1 \)
Number of instruments \( L = 14 \)
Number of excluded instruments \( L_1 = 1 \)

IV (2SLS) estimation

Estimates efficient for homoskedasticity only
Statistics consistent for homoskedasticity only

| part_ilicitos       | Coef.  | Std. Err. | z     | P>|z| |
|---------------------|--------|-----------|-------|------|
| [95% Conf. Interval]|        |           |       |      |
| D_for               | -0.1285422 | 0.0430641 | -2.98 | 0.003 |
| plantas_coca        | 8.33e-06  | 1.26e-06  | 6.59  | 0.000 |
| distancia1_0_distancia2 | -0.3013023  | 0.17742 | -1.70 | 0.089 |
| dias_aplicacion     | 0.000093   | 0.0001425 | 0.65  | 0.514 |
| superficie_total    | -0.006364  | 0.0005761 | -11.05| 0.000 |
| p13a                | -0.007731  | 0.0051027 | -1.52 | 0.130 |
| p15_a_os_2          | 0.0022702  | 0.0051027 | -1.52 | 0.130 |
| p51_precio          | 8.48e-07  | 2.90e-07  | 2.92  | 0.003 |
| p19_persona_trabajan | -0.0161826 | -0.0028927 | -2.81 | 0.005 |
| _cons               | 0.3179073  | 0.2237771 | 1.42  | 0.155 |
Impacto de la estrategia de participación forzosa en la erradicación de cultivos ilícitos

**Underidentification test (Anderson canon. corr. LM statistic):**

Under identification test (Anderson canon. corr. LM statistic): 39.970
Chi-sq(1) P-val = 0.0000

**Weak identification test (Cragg-Donald Wald F statistic):**

Weak identification test (Cragg-Donald Wald F statistic): 41.577
Stock-Yogo weak ID test critical values: 10% maximal IV size 16.38
15% maximal IV size 8.96
20% maximal IV size 6.66
25% maximal IV size 5.53

**Sargan statistic (overidentification test of all instruments):**

Sargan statistic (overidentification test of all instruments): 0.000
(equation exactly identified)

**First-stage regression of D_for:**

Statistics consistent for homoskedasticity only
Number of obs = 686

|            | Coef. | Std. Err. | t     | P>|t| |
|-------------|-------|-----------|-------|-----|
| D_for       |       |           |       |     |
| pnn         | -.001781 | .0002762 | -6.45 | 0.000 |
| plantas_coca | -.0000184 | 3.01e-06 | -6.11 | 0.000 |
| distancia1_0_distancia2 | -1.715013 | .5338819 | -3.21 | 0.001 |
| dias_aplicacion | -.0025156 | .0004434 | -5.67 | 0.000 |
| superficie_total | -.0034036 | .0021179 | -1.61 | 0.109 |

Se estima que el programa redujo en 12.85% la proporción de hectáreas sembradas de cultivos ilícitos, cuando la estrategia de participación es forzosa.

*Estimacion del Impacto por MC2E*

**ivreg2 part_mixtos $X (D_for= pnn), first**

First-stage regressions

**First-stage regression of D_for:**

Statistics consistent for homoskedasticity only
Number of obs = 686

|            | Coef. | Std. Err. | t     | P>|t| |
|-------------|-------|-----------|-------|-----|
| D_for       |       |           |       |     |
| pnn         | -.001781 | .0002762 | -6.45 | 0.000 |
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| superficie_total | -.0034036 | .0021179 | -1.61 | 0.109 |
Impacto de la estrategia de participación forzosa en la erradicación de cultivos ilícitos

<table>
<thead>
<tr>
<th>Variable</th>
<th>(Underid)</th>
<th>(Weak id)</th>
</tr>
</thead>
<tbody>
<tr>
<td>D_for</td>
<td>F( 1, 672) = 41.58</td>
<td>SW Chi-sq(1) = 42.44</td>
</tr>
<tr>
<td></td>
<td>P-val = 0.0000</td>
<td>P-val = 0.0000</td>
</tr>
</tbody>
</table>

Stock-Yogo weak ID F test critical values for single endogenous regressor:

- 10% maximal IV size: 16.38
- 15% maximal IV size: 8.96
- 20% maximal IV size: 6.66
- 25% maximal IV size: 5.53


NB: Critical values are for Sanderson-Windmeijer F statistic.

Underidentification test

Ho: matrix of reduced form coefficients has rank=K1-1 (underidentified)
Ha: matrix has rank=K1 (identified)
Anderson canon. corr. LM statistic Chi-sq(1) = 39.97, P-val = 0.0000

Weak identification test

Ho: equation is weakly identified
Cragg-Donald Wald F statistic = 41.58

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Impacto de la estrategia de participación forzosa en la erradicación de cultivos ilícitos

Stock-Yogo weak ID test critical values for K1=1 and L1=1:

<table>
<thead>
<tr>
<th>Maximal IV size</th>
<th>Critical Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>10%</td>
<td>16.38</td>
</tr>
<tr>
<td>15%</td>
<td>8.96</td>
</tr>
<tr>
<td>20%</td>
<td>6.66</td>
</tr>
<tr>
<td>25%</td>
<td>5.53</td>
</tr>
</tbody>
</table>


Weak-instrument-robust inference

Tests of joint significance of endogenous regressors B1 in main equation

Ho: B1=0 and orthogonality conditions are valid

<table>
<thead>
<tr>
<th>Test</th>
<th>Statistic</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anderson-Rubin Wald test</td>
<td>F(1,672)= 4.91</td>
<td>0.0270</td>
</tr>
<tr>
<td>Anderson-Rubin Wald test</td>
<td>Chi-sq(1)= 5.02</td>
<td>0.0251</td>
</tr>
<tr>
<td>Stock-Wright LM S statistic</td>
<td>Chi-sq(1)= 4.98</td>
<td>0.0256</td>
</tr>
</tbody>
</table>

Number of observations: N = 686
Number of regressors: K = 14
Number of endogenous regressors: K1 = 1
Number of instruments: L = 14
Number of excluded instruments: L1 = 1

IV (2SLS) estimation

Estimates efficient for homoskedasticity only
Statistics consistent for homoskedasticity only

| Coef.  | Std. Err. | z     | P>|z| |
|--------|-----------|-------|------|
| part_mixtos |         |       |      |
| D_for  | -0.0891663| 0.0432507| -2.06| 0.039|
| plantas_coca | -5.10e-07| 1.27e-06| -0.40| 0.688|
| distancia1_0_distancia2 | -1699628| 1781889| -0.95| 0.340|
| dias_aplicacion | -0.000517| 0.001431| -3.61| 0.000|
| superficie_total | -0.0038295| 0.005786| -6.62| 0.000|
| cada_cuanto_cosecha_0_tipo_culti | -0.0031108| 0.001694| -18.36| 0.000|
| cada_cuanto_cosecha_0_metodo_sie | 0.0007137| 0.0003562| 2.00| 0.045|

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Impacto de la estrategia de participación forzosa en la erradicación de cultivos ilícitos

\[ \begin{align*}
    \text{arrobas}_r \text{raspa}_0 \text{area}_cosechada_e | & \quad -0.0017405 \quad 0.0006911 \quad -2.52 \quad 0.012 \\
    \text{densidadplan}_3 | & \quad -1.50e-14 \quad 3.60e-15 \quad -4.16 \quad 0.000 \\
    \text{p13a} | & \quad 0.0098075 \quad 0.0051248 \quad 1.91 \quad 0.056 \\
    \text{p15}_a \text{os}_2 | & \quad 0.0000129 \quad 4.12e-06 \quad 3.12 \quad 0.002 \\
    \text{p51}_precio | & \quad -8.84e-07 \quad 2.92e-07 \quad -3.03 \quad 0.002 \\
    \text{p19}_persona\_trabajan | & \quad -0.0050975 \quad 0.003405 \quad -1.50 \quad 0.134 \\
    \_cons | & \quad 0.608223 \quad 0.224747 \quad 2.71 \quad 0.007 \\
\end{align*} \]

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25% maximal IV size 5.53

Sargan statistic (overidentification test of all instruments): 0.000  
(equation exactly identified)

Instrumented: D for
Included instruments: plantas\_coca distancial\_0 distancial\_2 dias\_aplicacion superficie\_total cada\_cuanto\_cosecha\_0\_tipo\_culti cada\_cuanto\_cosecha\_0\_metodo\_sie arrobas\_raspa\_0\_area\_cosechada\_e\_densidad\_plan\_3\_p13a p15\_a\_os\_2\_p51\_precio\_p19\_persona\_trabajan
Excluded instruments: pnn

Se estima que el programa redujo en 8.9% la proporción de hectáreas sembradas de cultivos mixtos, cuando la estrategia de participación es forzosa.