SURTAX REMOVAL, RICE SECTOR AND MIGRATION IN THE RIVER AREA IN SENEGAL: a computable general equilibrium approach

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Outline

– Problem statement

– Objective

– Methodology
  • Modelling surtax
  • Introducing migration in the model

– Simulation results
  • Macro
  • Sectoral
  • Well-being
Problem statement

- Before liberalizing rice imports in 1995, surtax was set by the Government to protect local rice production.

- For rice imports which price is greater or equal to 120 999 FCFA/tons → surtax of 30% applied.

- Surtax or TCI with TEC → tools allowed by WAEMU in the process of integration.

- Rate of surtax revised: passed from 30% to 20% because of the agreements carried out by Senegal toward WTO and WAEMU.

- Tariff dismantling is deepening and will affect rice sector;

- Rice surtax removal → suitable case of study to analyze the link between agricultural liberalization, migration and remittances in Senegal.
Problem statement

- Migration lead to loss of 0.3% population old of 15 years and plus (EMUS, 1997);
- Africa: 58% of Senegalese international migrants;
- France: main destination of Senegalese international migrants out of Africa (Mauritania, Ivory Coast, Cameroon, Gabon);
- First Senegalese international migrants in France: Soninke, Toucouleur, Mandjack;
- Some of reasons: collapse of local economy and removal of the interdiction for ships to offload seaman in French port like Marseille, Bordeaux, Le Havre and Dunkerque;
- Dakar: key role in the flow of River area migrants
Problem statement

Table 3: Destination of temporary and permanent Senegalese river migrants, 1992-1993

<table>
<thead>
<tr>
<th>Destination</th>
<th>Temporary migrants</th>
<th>Permanent migrants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saint-Louis</td>
<td>22,2</td>
<td>11,5</td>
</tr>
<tr>
<td>Other Senegalese regions</td>
<td>59</td>
<td>62,5</td>
</tr>
<tr>
<td>- Dakar</td>
<td>47,9</td>
<td>49,1</td>
</tr>
<tr>
<td>- Others</td>
<td>11,1</td>
<td>13,4</td>
</tr>
<tr>
<td>Foreign countries</td>
<td>18,8</td>
<td>26</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Guilmoto (1997)

- Long distance migration $\Rightarrow$ fact of permanent migrants,
- Transitory migration $\Rightarrow$ generally oriented toward closest destination (22% of them located in Saint-Louis region – Richard-Toll),
Table 4: Flow of remittances received by river area

<table>
<thead>
<tr>
<th>Destination</th>
<th>Remittances (in millions of FCFA)</th>
<th>Remittances (in %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>River area</td>
<td>4037</td>
<td>11.84</td>
</tr>
<tr>
<td>Other Senegalese regions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Dakar</td>
<td>10229</td>
<td>30.00</td>
</tr>
<tr>
<td>- Others</td>
<td>8578</td>
<td>25.16</td>
</tr>
<tr>
<td>Foreign</td>
<td>11251</td>
<td>33.00</td>
</tr>
<tr>
<td>Total</td>
<td>34095</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: MCS 1996
Methodology

SAM of 1996 with

- 3 activities/products:
  - River irrigated rice,
  - Other agricultural activities,
  - Urban non agricultural activities,

- 4 factors: capital, labour, land, water

- 4 Households: River area, Casamance, other rural area, urban
Methodology
Methodology

• CGE based on the SAM

Exter-plus (Decaluwé, Cockburn et Robichaud, 2002) and Senrur (Cabral, 2005)

-VA non-agricole technologie standard F(L,K)

VA AGRICULTURE IRRIGUEE

VA AGRICULTURE NON IRRIGUEE
Methodology

Modelling surtax

1. $TI = tx \times (P \times XS - PE \times EX) + tx \times (1 + tm + sm) \times e \times PWM \times M$

2. $ST = sm \times e \times PWM \times M$

3. $PM = tx \times (1 + tm + sm) \times e \times PWM$

4. $YG = \sum_{tr} TI_{tr} + \sum_{tr} TIE_{tr} + \sum_{tr} TIM_{tr} + \sum_{tr} ST_{tr} + \sum_{h} DTH_{h} + DTF + TWG$
Methodology

Introducing migration in the Model

Other rural activities

Non MIGurb

Rice Excess LS in River

MIGurb

MIGrow

Remittances

\[ LS_{\text{river}} = \sum_{j} LD_{j} \]

\[ LS_{\text{urb}} = LSO_{\text{urb}} + MIGurb \]

where \( MIG_{urb} = MIG_{urb} \left( \frac{w_{urb}}{w_{river}} \right) \), Excess rice labour sup ply, \( \mu \)

Labour market equilibrium in each area : \( LS = \sum_{j} LD_{j} \)
Price relationships

Basic Price Relationships in the Model

Export price
(pe)

output price
(px)

local price
(pl)

( +indirect taxes)
(tx)

domestic price
(pd)

composite price
(pc)

import price
(pm)

where

\[ pm = pwm \times er \times (1 + tm) \times (1 + tx); \]
\[ pm = pwm \times er \times (1 + tm) \times (1 + tx) \times (1 + st); \]

pwm is world price of imports; er exchange rate; tm tariff rate; tx : indirect tax rate; st : surtax rate
Simulation Results

- Sim 1: surtax removal
- Sim 2: surtax removal and supply of water for irrigation increase by 19%
- Sim 3: surtax removal and world import and export prices of agricultural products rise by 3%

Tariff rate:
- River irg Rice: 8.89%
- Rur agri activities: 15.82%
- UrbNag: 26.00%

Surtax rate:
- River irg Rice: 0.33%

Shares in total imports & export intensity:

<table>
<thead>
<tr>
<th></th>
<th>Mi/M</th>
<th>EXi/EX</th>
<th>Mi/Qi</th>
<th>EXi/XSi</th>
</tr>
</thead>
<tbody>
<tr>
<td>River irg Rice</td>
<td>9.25%</td>
<td>0.01%</td>
<td>90.90%</td>
<td>1.10%</td>
</tr>
<tr>
<td>Rur agri activities</td>
<td>6.50%</td>
<td>5.05%</td>
<td>11.91%</td>
<td>7.02%</td>
</tr>
<tr>
<td>UrbNag</td>
<td>84.25%</td>
<td>94.94%</td>
<td>23.55%</td>
<td>20.00%</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>23.03%</td>
<td>17.73%</td>
</tr>
</tbody>
</table>
• Sim 1

Macro level : no effects
Sim 1

Sectoral effects

- Import price in local currency $\rightarrow$ down by 0.3%
- Imports $\rightarrow$ up by 0.08%
- Local sales $\rightarrow$ down by 0.02%
- Local sales (88.9% prod) so reduction of rice production riz (-0.02%)
- Reduction of local rice price compared to PE so TCR depreciation: Exports $\rightarrow$ up by 0.22%
Sim 1
Effects on factor return, migration and remittances

- rate of return to water → down by 0.84% because of decline of rice production

- rate of return to land constant because supply of “other agri area” which represent 94% of land revenue remains constant

- rate of return to capital: → down by 0.25%

- urban wage rate: → down by 0.01%
- river area wage rate: → down by 0.01%
- D travail riz irrigué : → down by 0.35%

- weak migration from river area to urban area (0.003% LS river) and ROW (0.001% LS river) then weak flow of remittances (0.001% river area wages).
## Sim 1

### Households well-being

<table>
<thead>
<tr>
<th></th>
<th>Urban area</th>
<th>Other rural areas</th>
<th>River area</th>
<th>Senegal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in nominal income</td>
<td>-0.01</td>
<td>0.00</td>
<td>-0.01</td>
<td>-0.01</td>
</tr>
<tr>
<td>Change in consumption prices</td>
<td>-0.01</td>
<td>-0.02</td>
<td>-0.02</td>
<td>0.00</td>
</tr>
<tr>
<td>Change in well-being</td>
<td>-0.01</td>
<td>0.02</td>
<td>0.01</td>
<td>0.00</td>
</tr>
</tbody>
</table>

No effect on Government budget
SIM 2

Macro effects

• Prices:
  – Import price in local currency → down by 0.02%
  – Domestic price: → up by 0.11%
  – Local prices: → up by 0.08%
  – Consumer price: → up by 0.08%
• Imports in volume: → down by 0.02%
• Exports in volume: → down by 0.03%
• Local sales: → up by 0.02%
• Production: → up by 0.01%
SIM 2

Sectoral effects

- Rice import price in local currency: $\rightarrow$ down by 0.3%
- Domestic prices: down by 8.28% more than PM rice so
- Local sales: $\rightarrow$ up by 11.61% and Imports: $\rightarrow$ down by 0.62%
- Sharp fall of rice local price compared to PE so RER depreciated: Exports $\rightarrow$ up by 17.32%
- Production: $\rightarrow$ up by 11.67% because of local sales increases(89.9% XS)
SIM 2

Effects on factor return, migration and remittances

- cost of water: down by 75.75%
- rate of return to land: → up by 0.67%
- rate of return to capital: → up by 44.86%
- river area wage rate: → up by 7.02%
- Labour D: → up by 57.47% for rice sector and 0.03% for river
- urban wage rate: → down by 0.05%
- Migration toward Dkr: → down by 0.41% of LS River.
- Migration toward ROW: → down by 0.14% of LS River.
- Remittances: → down by 0.17% of river wages.
## SIM 2

### Households well-being

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<th>River area</th>
<th>Senegal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in nominal income</td>
<td>-0.04</td>
<td>0.05</td>
<td>4.07</td>
<td>0.08</td>
</tr>
<tr>
<td>Change in consumption prices</td>
<td>0.08</td>
<td>0.10</td>
<td>0.08</td>
<td>0.08</td>
</tr>
<tr>
<td>Change in well-being</td>
<td>-0.12</td>
<td>-0.05</td>
<td>3.90</td>
<td>-0.01</td>
</tr>
</tbody>
</table>

No effect on Government budget
SIM 3
Macro effects

• Prices:
  – Import price in local currency: → up by 0.4%
  – Consumer prices: → up by 0.26%
  – Producer price: → up by 0.17%

• Imports in volume: → down by 0.29 %
• Exports in volume: → up by 0.14 %
• Local sales: → down by 0.03%
• Production: → constant
SIM 3
Sectoral effects

- Rice import price in local currency: → up by 2.68%
- Imports: → down by 0.51 %
- Substitution between local sales and imports
- Local sales: → up by 0.06%
- Production: → up by 0.07%
- PE rise more than PD so RER depreciation then Exportation: → up by 0.76%
SIM 3

Effects on factor return, migration and remittances

- rate of return to capital: → up for all sectors except urban non-agricultural sectors
- rate of return to land: → up by 2% (because of increase of other rural agri → 94% land revenue)
- rate of return to water: → up by 6.15% (because of increase of rice production)
- river area wage rate: → up by 2.63% (because of activities expand in river area)
- urban wage rate: → down by 0.37%
- Migration toward Dkr: → down by 0.006% of LS River
- Migration toward ROW: → down by 0.002% of LS River
- Remittances: → down by 0.003% of river wages
## Households well-being

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<th>Other rural areas</th>
<th>River area</th>
<th>Senegal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in nominal income</td>
<td>-0.23</td>
<td>1.21</td>
<td>1.28</td>
<td>0.09</td>
</tr>
<tr>
<td>Change in consumption prices</td>
<td>0.32</td>
<td>0.52</td>
<td>0.50</td>
<td>0.26</td>
</tr>
<tr>
<td>Change in well-being</td>
<td>-0.40</td>
<td>0.71</td>
<td>0.56</td>
<td>-0.16</td>
</tr>
</tbody>
</table>
Effects on Government budget

• Government income: → down by 0.14%
• Public consumption: → down by 0.19%
• Investment (in value): → up by 0.05%
Conclusions & Policy lessons

• Policy makers in WAEMU give a great importance to surtax as a tool to protect local producers but this instrument is not too efficient. TCI on imported rice: not efficient: $\rightarrow$ weak effect on river irrigated rice sector

• Reducing the cost of water (the main factor) have more impact on rice supply compared to the use of fiscal instrument (surtax)

• effects arise with increasing water supply or in a context of cut on grants to north agricultural producers subsidies

• Flow of migrants and, in turn remittances, when irrigated rice activity is affected
Conclusions & Policy lessons

• Price-effects more important so winners are river and other rural households

• If surtax is used, policymakers may address the pb of distortions effects induced by non uniform TCI in WAEMU with regard to TEC
END