Impacts of the Austrian Programme of Rural Development

AT-RDP 07-13

Franz Sinabell (coordination)
Mathias Kirchner, Dieter Pennerstorfer, Gerhard Streicher
evaluation of AT-RDP 07-13
presentation outline

- the programme
- evaluation questions
- choice of methods
- impact analysis
- discussion / lessons learned
AT-RDP 07-13
EU-support per inhabitant 2007

06.07.2016
regional distribution of public support (EU, federal gvnmt, Länder) per inhabitant

public transfers from 2007-2013

unter 100 Euro p.P.
100 bis unter 500 Euro p.P.
500 bis unter 1.000 Euro p.P.
1.000 bis unter 1.500 Euro p.P.
1.500 bis unter 2.000 Euro p.P.
2.000 bis unter 2.500 Euro p.P.
2.500 Euro mehr p.P.

Grenzen der NUTS 3-Regionen

BMLFUW, 2015, elektronisch übermittelt am 7.12.2015.
evaluation questions:

to what extent has the RDP contributed to …

- the growth of the whole rural economy
- employment creation
- protect and enhance natural resources and landscape including, biodiversity and HNV farming and forestry
- the supply of renewable energy
- improving the competitiveness of the agricultural and forestry sector
- climate change mitigation and adaptation
- improvement of water management (quality, use and quantity)
- improving the quality of life in rural areas and encouraging diversification of the rural economy

analytical challenges

evaluation of AT-RDP

counterfactual analysis:
methods and approaches
ex-post evaluation of impacts of AT-PRD
a multi method approach

- Regional EAA
  - IACS
- RA, NUTS0-IO
  - Regional I-O
- Municipality data
- PASMA [grid]
- BERIO-ASCANIO
- Econometric analysis

Impact indicators:
- Value added
- Employment
- CO₂ equivalent emission
- N-balance
- Quality of life
impacts on
agriculture
PASMA[grid]
axis 2  0,8 bn Euro p.a.
agri-environment and compensatory payments
**Inputs:** Preise, Produktionskosten, Direktzahlungen und PLE, Erträge, Nährstoff- und Futterbedarf, Regional Ausstattung, Beobachtete Aktivitäten...
impact of axis 2
based on agricultural sector model

- economic effects
  - more jobs in agriculture (+4%: 6,700 jobs, = 4,900 AWU)
  - lower gross-value added (-5%)
    - result is in conflict with programme goal
    - to be explained: high cost for ecological measures which are part of GVA-calculation whereas benefits are not
  - higher incomes in agriculture (+15%)

- environmental indicators
  - reduction of N-surplus (-16%)
  - reduction of GHG emission (-3%)
impact of axis 2
land use effects

change of land use in case axis 2 was abolished

-70.0% -60.0% -50.0% -40.0% -30.0% -20.0% -10.0% 0.0% 10.0%

Wald
Intensives Grünland
Extensives Grünland
Biologisch bewirtschaftete Fläche
Almen

forest land
intensive grassland
extensive grassland
organic agriculture
alpine grassland
impact of axis 2 on nitrate balance based on agricultural sector model

change on levels of nitrate balance

- < -20kg/ha
- -20 bis -10
- -10 bis -1
- -1 bis 1
- 1 bis 10
- 10 bis 20
- > +20kg/ha

impact of axis 2 on nitrate balance

06.07.2016
impact on the whole rural / regional economy

BERIO-ASCANIO

all measures

1,1 bn Euro p.a.
BERIO-ASCANIO
I-O type model at district level

Production of domestic firms

- Prices
- Labour market
  - Wage per hour
- Labour demand
- Value added
- Products supply domestic ($p^Dq^D$)
- Products supply imports ($p^Mq^M$)

Intermediate demand goods

- Government
  - Taxes
- Disposable income
- Taxes
- Transfers
- Capital stock

Private consumption
- Exports
- Public consumption
- Gross investments

Product flow ij between 99 model regions and the rest of the world

06.07.2016
ATRDP 07-13: impact on the economy
gross value added and labour market

- method
  - input-output-model, relations between all sectors of the
economy, government, households, foreign trade
  - economic relations between regions (district level ~NUTS4)
  - direct, indirect and induced effects

- GVA effect: +1.6 bn Euro

- employment effect
  - in total 30,300 jobs = 25.600 FTE (incl. agriculture)
change of gross value added: +1.6 bn Euro
sensitivity scenarios

(1) add private leverage (as reported in files) 
programme volume increases to 1,6 instead of 1,1 bn € p.a.

(2) alternative use of public funds in Austria 
programme volume 1,1 bn € p.a. and simultaneously public consumption is reduced by 0,5 bn € p.a. (proportionally)

results of sensitivity scenarios

(1) proportionally stronger impact of programme 
GVA: +2.6 bn € and FTE: +37,900

(2) negative impact 
GVA: -1.4 bn € and FTE: -14,100
impact on indicators of quality of life in municipalities

econometric analysis

all measures:

1,1 bn Euro p.a.
ATRDP 07-13: impact on quality of life
fixed-effects model with municipality data

**method**

- quality of life is hard to measure directly - survey necessary to ask individuals about their well-being
- approach: use indicators related to quality of life
- statistically (significant) relationship between quality of life indicator and public support and indicators of
- basis public data available for each municipality (ca. 2,200) in Austria
- econometric approach: fixed-effects (controlling for unobserved heterogeneity, when heterogeneity is constant over time)
# ATRDP 07-13

## Public Transfers (mn Euros)

<table>
<thead>
<tr>
<th>轴</th>
<th>Jahr</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>总计</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: competitiveness</td>
<td>2007</td>
<td>101.59</td>
<td>239.52</td>
<td>249.96</td>
<td>215.95</td>
<td>186.63</td>
<td>158.71</td>
<td>129.45</td>
<td>1,281.81</td>
</tr>
<tr>
<td>2: environment</td>
<td>2007</td>
<td>788.89</td>
<td>812.66</td>
<td>842.97</td>
<td>839.89</td>
<td>830.93</td>
<td>810.12</td>
<td>788.03</td>
<td>5,713.48</td>
</tr>
<tr>
<td>3: quality of life, diversification</td>
<td>2007</td>
<td>93.16</td>
<td>110.51</td>
<td>112.44</td>
<td>136.95</td>
<td>138.25</td>
<td>116.05</td>
<td>105.74</td>
<td>813.10</td>
</tr>
<tr>
<td>4: LEADER</td>
<td>2007</td>
<td>0.00</td>
<td>2.04</td>
<td>15.19</td>
<td>24.95</td>
<td>24.05</td>
<td>23.01</td>
<td>27.46</td>
<td>116.69</td>
</tr>
<tr>
<td>511: technical assist</td>
<td>2007</td>
<td>18.44</td>
<td>27.46</td>
<td>33.45</td>
<td>37.13</td>
<td>39.45</td>
<td>40.21</td>
<td>3.37</td>
<td>199.51</td>
</tr>
<tr>
<td>总计</td>
<td>2007</td>
<td>1,002.07</td>
<td>1,192.19</td>
<td>1,254.02</td>
<td>1,254.87</td>
<td>1,219.31</td>
<td>1,148.10</td>
<td>1,054.04</td>
<td>8,124.59</td>
</tr>
</tbody>
</table>
### beneficiaries of AT-RDP 07-13
(transfer in Euro per capita)

<table>
<thead>
<tr>
<th>Variable</th>
<th>coeff. 1</th>
<th>coeff. 2</th>
<th>coeff. 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>unemployment rate (2001; in Prozent)</td>
<td>-186.35***</td>
<td>-248.30***</td>
<td>-256.80***</td>
</tr>
<tr>
<td>income (2006; in Euro per capita)</td>
<td>-0.13***</td>
<td>-0.16***</td>
<td>-0.22***</td>
</tr>
<tr>
<td>municipality tax (in Euro; 2005)</td>
<td>-1.15***</td>
<td>-0.64**</td>
<td>-0.30</td>
</tr>
<tr>
<td>income of women (2006; in % of men)</td>
<td>37.72***</td>
<td>27.99***</td>
<td>21.85***</td>
</tr>
<tr>
<td>population density (2006; in primary res. per ha)</td>
<td>22.51</td>
<td>49.77</td>
<td>64.06*</td>
</tr>
<tr>
<td>primary residence (2006)</td>
<td>-0.07***</td>
<td>-0.06***</td>
<td>-0.06***</td>
</tr>
<tr>
<td>area (in ha)</td>
<td>0.08***</td>
<td>0.05***</td>
<td>0.02**</td>
</tr>
<tr>
<td>altitude (average; in m)</td>
<td>2.21***</td>
<td>3.55***</td>
<td>3.85***</td>
</tr>
<tr>
<td>motorway (length in m)</td>
<td>-0.05***</td>
<td>-0.03</td>
<td>0.00</td>
</tr>
<tr>
<td>railway (length in m)</td>
<td>-0.05***</td>
<td>-0.05***</td>
<td>-0.03***</td>
</tr>
<tr>
<td>express road (Länge in m)</td>
<td>-0.06*</td>
<td>-0.09***</td>
<td>-0.05</td>
</tr>
<tr>
<td>Intercept</td>
<td>1,029.58*</td>
<td>1,980.36***</td>
<td>1,593.05**</td>
</tr>
<tr>
<td>Regional-Dummys</td>
<td>no</td>
<td>land (8)</td>
<td>district (94)</td>
</tr>
</tbody>
</table>
beneficiaries of AT-RDP 07-13 (transfers in Euro per capita)

<table>
<thead>
<tr>
<th>variable</th>
<th>coeff.</th>
<th>coeff.</th>
<th>coeff.</th>
</tr>
</thead>
<tbody>
<tr>
<td>urban land use</td>
<td>-22.00***</td>
<td>-17.88**</td>
<td>-18.28**</td>
</tr>
<tr>
<td>industrial areas, traffic areas</td>
<td>76.13***</td>
<td>54.03***</td>
<td>20.27</td>
</tr>
<tr>
<td>mining regions, construction sites</td>
<td>-0.43</td>
<td>13.23</td>
<td>-26.74</td>
</tr>
<tr>
<td>artificial regions</td>
<td>-46.87</td>
<td>-54.67</td>
<td>-78.01**</td>
</tr>
<tr>
<td>arable land</td>
<td>22.67***</td>
<td>24.96***</td>
<td>18.14***</td>
</tr>
<tr>
<td>permanent crops, orchards, vineyards</td>
<td>36.63***</td>
<td>31.90***</td>
<td>14.70**</td>
</tr>
<tr>
<td>grassland</td>
<td>25.28***</td>
<td>35.16***</td>
<td>31.85***</td>
</tr>
<tr>
<td>heterogeneous agricultural land</td>
<td>3.57</td>
<td>11.61***</td>
<td>13.06***</td>
</tr>
<tr>
<td>mining regions, construction sites</td>
<td>3.75</td>
<td>22.83***</td>
<td>29.11***</td>
</tr>
<tr>
<td>regional dummies</td>
<td>no</td>
<td>province (8)</td>
<td>district (94)</td>
</tr>
</tbody>
</table>
AT-RDP 07-13: relationship between transfers and population growth
AT-RDP 07-13: relationship transfers and revenues from municipality tax
AT-RDP 07-13: relationship transfers and change of employment outside agr.

![Graph showing relationship transfers and change of employment outside agriculture](image-url)
lessons learned 1/3: effects on quality of life indicators

results of evaluation:

- the program has significant effects over many target dimensions
- not only recipients benefit but many other groups in the rural economy (most money goes to farmers)
- econometric results are in general consistent with model results; RDP is stimulating positive structural change outside agriculture

limitations

- non market goods and important non economic variables have not been measured
- social costs of public funds are generally no concern in EU programme evaluations but should be
Lessons learned 2/3: Assessment of methodologies

- Computational models
  - Multi-model approach allows to evaluate a broad range of measures / indicators
  - Even very detailed models rest on crucial assumptions

- Econometric analysis
  - Limitations: non market goods and important non economic variables have not been measured
  - Causality: would require (slightly) different programme implementation, additional monitoring data; other model

- Benefits of multi-method approach
  - Computational models: well suited for ex-ante mid-term and ex-post
  - Econometric models: useful to corroborate / challenge results of computational models
  - Micro data for effects on firms / inhabitants would be more helpful
lessons learned 3/3: strength and weaknesses

multi-method and multi-model approach in evaluation

- weaknesses
  - more data and resource intensive
  - researchers and clients must be convinced that there is not "THE" method but that each approach has (dis-)advantages
  - inconsistent results raise more questions than can be answered

- strengths
  - same question can be answered from more than one angle
  - when data and approach is well integrated: complementary aspects can be identified
  - validity of the results can be evaluated
  - idiosyncratic limitations of methods can be overcome
  - necessary precondition to improve the current state of knowledge
thank you for your attention!