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Counter-sanctions and agricultural dynamics in Russian regions: has acceleration occurred? Evidence from Difference-in-difference approach

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Introduction

External and internal factors of Russian economic development since 2014 year

- Oil price fall in 2014-2015 years
- Financial sanctions, imposed by US, EU and other countries on Russia
- National currency (ruble) depreciation
- Import substitution policy in Russia: government programs, encouraging agriculture, food industry and manufacturing as a whole
- Russian agricultural and food embargo on products from US, EU, Australia, Canada, Norway and other countries.
 Share of government support of the second second





Share of government support in value added of agriculture and food industry

Russian agriculture: new multidirectional stimulus since 2014 year

New positive stimulus:

- Agrifood embargo imposed in august 2014
 - "semi embargo": only on products from US, EU, Australia, Canada, Norway and other countries.
- Double ruble devaluation
- Producer price growth
- Expansion of agricultural subsidizing by 18% in 2014-2017 period in nominal terms (and constant in real terms)

New constraints for agricultural development:

- contracted consumer demand even for food! (-10% in 2016 to 2013) due to general stagnation of Russian economy
- increase of production costs due to the strong dependence on imported machinery, equipment and some intermediate consumption products



Agrofood import dynamics



Higher than average value added growth in agriculture in sanction period (2014-2018 years)



Literature on the effects of Russian countersanctions (food embargo)

• Effects on EU and world markets:

(Banse, Duric, Götz, Studies, & 2019), (Veebel & Markus, 2018), (Mauricas, 2015), (Boulanger, Dudu, Ferrari, & Philippidis, 2016), (Kutlina-Dimitrova, 2017) Estimates of losses in terms of exports and GDP in EU countries.

• Effects on Russian market:

- Only few papers are devoted to quantitative assessment of the impact of counter-sanctions
- (Volchkova & Turdyeva, 2016), (Borodin, 2016, 2018), (Svetlov, Yanbykh, & Loginova, 2019), (Skrypnik, Zaytsev, & Ryazanov, 2019).
 - Literature indicates positive contribution of embargo and subsidies to dynamics of agriculture in general and in the short term (for 2014).
- Limitations of existing literature
 - calculations only for 2014 year (it is reform year problem!), or for individual markets (meat markets) or for several regions of Russia
 - ex ante scenario calculations

• Main novelty of our work:

- A posteriori analysis of the whole counter-sanction period (2015-2017)
- Analysis based on regional data
- It gives opportunity to find year and regional specifics of countersanctions effects

Main findings: short-term effect and key-producers gain more

- Counter-sanctions led to one-year acceleration of the agricultural dynamics in all Russian regions only in 2015 year (+6.1 p.p.)
- But the key producing regions received a longer-lasting effect up to 2016 inclusive

(+ 7.3 p.p. in 2015 and +9.8 p.p. in 2016. Totally +17.1 p.p.).

• Regions with a high concentration of agricultural holdings received a slightly greater advantage from counter-sanctions than the average region, but this effect came with an annual lag - only in 2016 (+8.4 p.p.).

Research strategy and data

Research strategy

Difference-in-difference approach (DD) developed by Card (1990)



In our case:

- "Participants" or "treatment group" agriculture in Russian regions
- "Control group" other industries (energy, construction, transportation and hotels/ restaurants)
- Pretreatment period: 2005-2013 years
- Reform year: 2014 (august)
- Treatment period: 2015-2017 years ("Sanction period")

The model (panel data fixed effects DD model)

$$y_{ijt} = \beta_1 + \beta_{2t}T_t + \beta_{3t}Agro_{ij}T_t + \mathbf{X}_{ijt}^{\prime}\gamma_1 + Agro_{ij}\mathbf{X}_{ijt}^{\prime}\gamma_2 + Region_i \cdot Industry_j + \varepsilon_{ijt}$$

Variables:

- y_{ijt} Log of real value added of industry j in region i and period t
- *T_t* are annual dummies,
- Agro_{ii} is a dummy distinguishing the treated and control groups,
- X'_{iit}- vector if control variables (Labor and lagged investment)
- *Region_i* · *Industry_j* are fixed effects for a specific industry in a particular region.

Coefficients of interest:

- β_{2t} annual change in GVA in all industries in period t compared to the base 2005 year
- β_{3t} additional component of growth in agriculture in t period
- Year-on-Year effects of countersanctions obtained by $\Delta\beta_{3t} = \beta_{3t} \beta_{3,t-1}$

Main features and data:

- Panel data, where the unit is an industry in a certain region (official regional data from Rosstat)
- Dummies for each year to asses counter sanction effects on yearly basis (not period average effect as usual in DD approaches)

Regional groups for model estimation:

- All 71 regions
- "Key producers" 13 regions
- Regions with high concentration of large-scale farming entities ("agroholdings") - 14 regions

Data

- Data on 71 region
- 2005-2017 years
- 5 industries: agriculture + 4 control industries
- Source of data: official Rosstat data

Main results Counter-sanctions effects on agriculture

 $y_{ijt} = \beta_1 + \beta_{2t}T_t + \beta_{3t}Agro_{ij}T_t + \mathbf{X}_{ijt}^{\prime}\gamma_1 + Agro_{ij}\mathbf{X}_{ijt}^{\prime}\gamma_2 + Region_i \cdot Industry_j + \varepsilon_{ijt}$

	(1)	(2)	(3)	(4)
Dependent variable: Log of real value added	All regions (NO controls)	All regions (+controls)	Regions with high concentration "agroholdings" (+controls)	"Key producers" (+controls)
Dummy, growth in all industries <u>compared</u>	I to the base 2005 year , β_{2t}			
2005 (base period for model (1))				
2006 (base period for (2)-(4) models)	0.0830***			
2007	0.206***	0.111***	0.104***	0.0991***
2008	0.275***	0.173***	0.191***	0.175***
2009	0.194***	0.0875***	0.116***	0.101***
2010	0.245***	0.143***	0.191***	0.160***
2011	0.296***	0.199***	0.271***	0.213***
2012	0.341***	0.241***	0.316***	0.262***
2013	0.352***	0.246***	0.327***	0.281***
2014	0.360***	0.257***	0.346***	0.297***
2015	0.344***	0.236***	0.349***	0.286***
2016	0.346***	0.237***	0.338***	0.275***
2017	0.359***	0.252***	0.334***	0.295***
Dummy, additional component of growth i	in agriculture, β_{3t}			
2006	-0.0279			
2007	-0.109***	-0.086***	-0.104**	-0.0444
2008	-0.120***	-0.104***	-0.0726	0.0232
2009	-0.0394	-0.0105	0.0178	0.100**
2010	-0.160***	-0.131***	-0.173***	-0.117**
2011	-0.000440	0.0327	0.0758	0.0862*
2012	-0.0831***	-0.0594**	0.00511	-0.0685
2013	-0.0745**	-0.0431	0.0817	0.00139
2014	0.00703	0.0292	0.187***	0.0657
2015	0.0532*	0.0902***	0.242***	0.139***
2016	0.0644**	0.109***	0.326***	0.237***
2017	0.0807***	0.121***	0.319***	0.246***
Labor elasticity		0.260***	0.248**	0.539***
Additional component of Labor elasticity for agriculture		0.0627*	0.695***	0.688***
Investment elasticity t-1		0.00455	-0.032***	-0.000645
Additional component of Investment elasticity t-1 for agriculture		0.0520***	0.173***	0.0427**
Constant	2.659***	2.019***	0.509	0.694
Observations	4,474	4,063	840	773
R-squared	0.313	0.292	0.656	0.547
Number of regions	71	71	14	13

$\Delta\beta_{3t} = \beta_{3t} - \beta_{3,t-1}$ (Year-on-Year effects of countersanctions)

	(1)	(2)	(3)	(4)
	All regions (NO controls)	All regions (+controls)	Regions with high concentration "agroholdings" (+controls)	"Key producers" (+controls)
2008	-0.011	-0.018	0.031	0.068*
2009	0.080**	0.094***	0.090	0.077*
2010	-0.120***	-0.120***	-0.191***	-0.218***
2011	0.159***	0.163***	0.249***	0.204***
2012	-0.083***	-0.092***	-0.071*	-0.155***
2013	0.009	0.016	0.077*	0.070*
2014	0.082***	0.072***	0.105**	0.064*
2015	0.046*	0.061**	0.055	0.073*
2016	0.011	0.019	0.084*	0.098**
2017	0.016	0.012	-0.007	0.009
Std. error	0.030	0.028	0.052	0.046

Significance levels: *** p<0.01, ** p<0.05, * p<0.1.

Conclusion

- Counter-sanctions led to one-year acceleration of the agricultural dynamics in all Russian regions only in 2015 year (+6.1 p.p.)
- But the key producing regions received a longer-lasting effect up to 2016 inclusive (+17.1 p.p. totally).
- Regions with a high concentration of agricultural holdings received a slightly greater advantage from counter-sanctions than the average region, but this effect came with an annual lag - only in 2016 (+8.4 p.p.).

Possible reasons of short-term effect on agricultural dynamics:

- Embargo itself has a short-term impact on imports decline and domestic prices rise: as shown by other studies, it took place only in 2014-2015.
- Constrains from macroeconomic conditions stagnation of Russian economy:
 - Declining demand for food products (up to 10% in 2016/2013 year in real terms)
 - Investment constraints because of high inters rates
- The larger gains for key producers can be explained by a gradual shift in government support towards subsidizing larger companies.

Thank you!!!

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