

# **FDI spillover effects in manufacturing and services: Empirical evidence on SEE Economies**

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# Context

- I. Research interest
- II. Theory
- III. Empirical evidence
- IV. Data and Methodology
- V. Results
- VI. Conclusions

# I Research interest

Transition economies (TEs) inherited outdated capital, inefficient production structures from the previous political-economic system (EBRD, 2013).

FDI has significantly increased in TEs over the past few decades.

FDI as % of GDP during 2000-2016

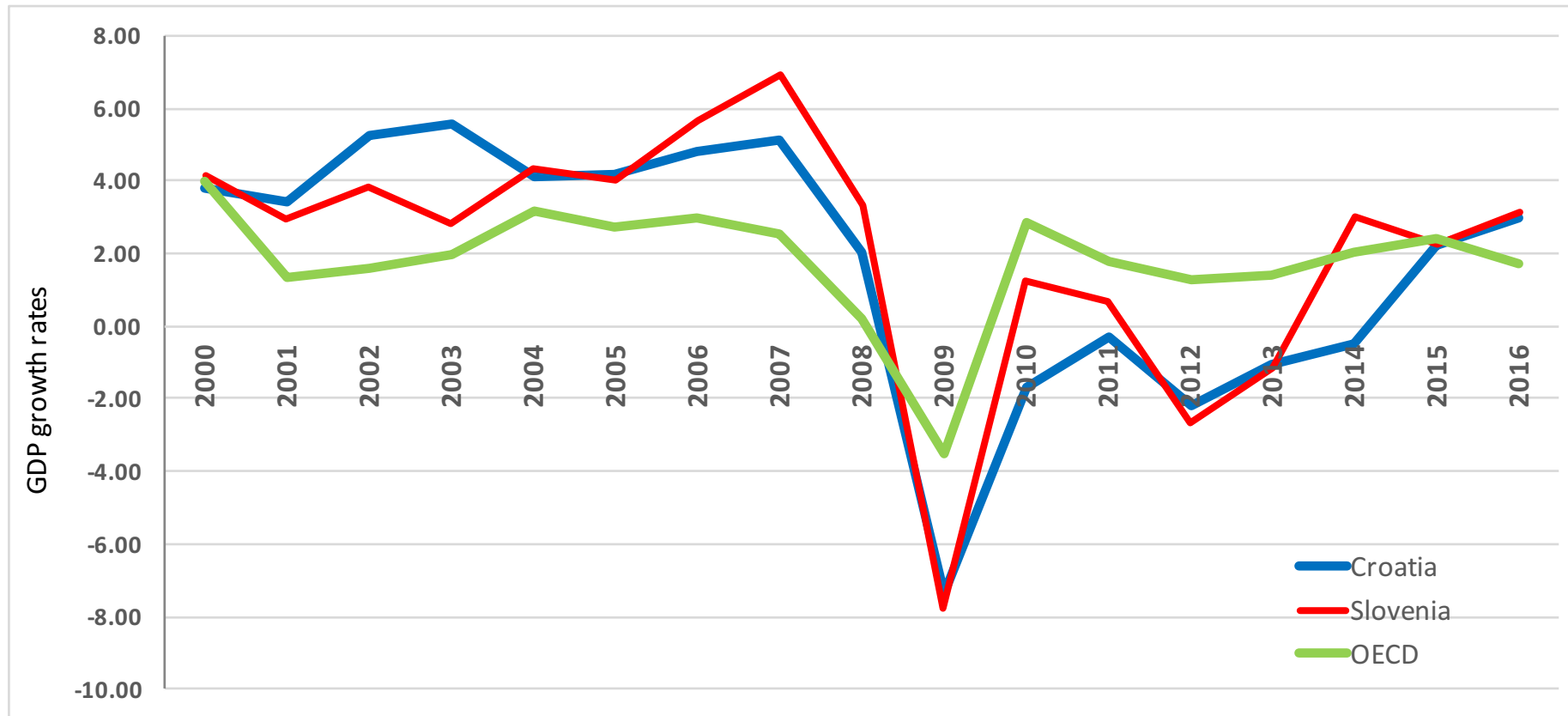
- Croatia - 4.2%
- Slovenia – 2.1%
- World - 3%

# I Research interest

- Global FDI stock (UNCTAD, 2017)
  - two-thirds goes to services
  - 26% goes to manufacturing
- FDI n Croatia (Croatian National Bank, 2017)
  - 70% goes to services
  - 15% goes to manufacturing
- In Slovenia (Bank of Slovenia, 2017)
  - 62.3% goes to services
  - 33.2% goes to manufacturing

# I Research Interest

GDP growth rates in Croatia, Slovenia and in OECD countries



Years of recession:

- Croatia: 2009-2014 (ranging from -0.3% to -7.4%)
- Slovenia: 2009 (-7.8%), 2012 (-2.7%) and in 2013 (-1.1%).

# I Research Interest

- In TEs, bank lending is still the main source of funds for technology and knowledge-intensive activities (EBRD, 2018).
- Bank credit policies were restrictive in Croatia and Slovenia after financial crisis. Only firms in countries where banks loosened their credit criteria were able to adopt new technology (EBRD, 2014).
- Prevailing economic conditions in the two economies post financial crisis, questioned the benefits that can be incurred through FDI.

# I Research interest

- Why Croatia and Slovenia?
  - geographical, historical and societal similarities
    - (belonged to the same country 1918-1990)
  - different economic conditions
    - GDP per capita (2016)
      - US\$12,149 in Croatia
      - US\$21,650 in Slovenia
    - Slovenia in EU since 2004, Croatia since 2013
    - Slovenia - EMU member since 2007

# II Theory

## Multinational corporations

- undertake a significant part of the world's R&D and employ the most advanced production technologies (Blomström, 1991)
- increasingly decentralise their R&D activities abroad and in less developed markets (OECD, 2011; Branstetter et al, 2018)
  
- *The spillovers occur when local firms benefit from the MNCs affiliate's superior knowledge of product, process technology or markets, without incurring a cost that exhausts the whole gain from the improvement (Blomström and Kokko, 1997, pg12).*
  
- FDI spillovers could be:
  1. Horizontal
  2. Vertical
    - Backward
    - Forward
  
- Market-stealing effects may crowd-out spillovers



# II Theory

Productivity spillovers depend on various factors.

## 1. Technological gap

- Findlay (1978) - theory of relative backwardness
- Nelson and Phelps (1966)

## 2. Absorptive capacity

- Knowledge stock

## 3. Firm size

- Smaller firms are considered source of growth (Acs and Audretsch, 1990)
- Small firms have fewer access to bank lending (lower collateral) (De and Nagaraj, 2014) especially in less developed financial markets.

## 4. Industry competition

- Firms in concentrated industries may have more resources (Levin et al., 1985, Heirati et al., 2016)

# II Theory

- Knowledge spillovers in services
  - The simultaneity of production and consumption processes (Bishop, 2009)
  - Harder to detect knowledge (Toivonen and Touminen, 2009)
  - Collaboration with external partners is rare (Schmidt, 2015)
  - Intense rivalry and competition prevailing in some industries (Ibert and Müller, 2015)

# III Empirical evidence

- Empirical evidence on transition economies

Authors	Countries Studied	Period
Djankov and Hoekman (2000)	Czech Rep.	1992-1996
Konings (2001)	Bulgaria, Poland, Romania	1993-1997
Javorcik (2004)	Lithuania	1996-2000
Sabirianova et al. (2005)	Czech R., Russia	1992-2000
Halpern and Muruközy (2007)	Hungary	1996-2003
Nicolini and Resmini (2010)	Bulgaria, Poland, Romania	1998-2003
Kosová (2010)	Czech Rep.	1994-2001
Javorcik and Spatareanu (2011)	Romania	1998-2003
Monastiriots and Alegria (2011)	Bulgaria	2002-2005
Kokko and Kravtsova (2012)	Ukraine	1999-2003
Gorodnichenko et al. (2014)	17 TEs	2002-2006
Damijan et al. (2013)	Bulgaria, Czech R., Croatia, Estonia, Latvia, Lithuania, Poland, Romania, Slovenia, Ukraine	1995-2005
Monastiriots (2014)	SEE, CEE, Asian TEs	2002-2009
Orlic et al. (2018)	Czech Republic, Estonia, Poland, Hungary, Slovakia, Slovenia	2002-2010

- All the studies refer to the period before the financial crisis
- None investigate Croatia
- Only one study investigates services (Gorodnichenko et al., 2014)

# III Empirical evidence - manufacturing

- **Horizontal spillovers in TEs:**
  - **insignificant** (Javorcik, 2004; Halpern and Muraközy, 2007; Kosov; 2010; Javorcik and Spatareanu, 2011)
  - **negative** (Javorcik and Spatareanu, 2011; Damijan et al., 2013; Sabirianova et al. (2005) Orli et al., 2018)
  - **rarely positive** (Nicolini and Resmini, 2010; Monastiriotis and Alegria, 2011; Gorodnichenko et al., 2014)
- **Horizontal spillovers in developed countries:**
  - **positive** (Haskel et al., 2007; Girma et al., 2008; Keller and Yeaple, 2009; Bode et al., 2012)
  - **rarely insignificant** (Barrios et al., 2006; Crespo et al., 2012)

# III Empirical evidence

- **FDI backward spillovers in manufacturing:**

- **Positive in TEs**

- (Javorcik, 2004; Nicolini and Resmini; 2007; Blalock and Getler, 2008; Gorodnichenko et al., 2014)

- **Insignificant in developed countries**

- (Barrios et al., 2006; Haskel et al, 2007; Crespo et al., 2012)

- **FDI forward spillovers in manufacturing:**

- **Mostly insignificant or negative n TEs**

- (Javorcik, 2004; Barrios et al., 2006; Damijan et al. 2013)

- **Insignificant in developed economies**

- (Barrios et al., 2006; Haskel et al., 2007; Girma et al., 2008)

# IV Data and methodology

- Bureau Van Dijk's Amadeus firm level data
- Period of study 2006-2014
- System Blundell-Bond (1998) GMM:

$$TFP_{ijrt} = TFP_{ijrt-1} + \alpha_1 horizontal_{jt} + \alpha_2 backward_{jt} + \alpha_3 forward_{jt} + \beta HH_{jt} + \gamma X_{ijrt} + Industry_j + Region_r + Period_t + \varepsilon_{ijrt}$$

*i* - firm; *j* - industry; *r* - region; *t* - year

*TFP*<sub>*ijrt*</sub> - total factor productivity (semi-parametric Wooldridge (2009) estimator)

*HH*<sub>*jt*</sub> - industry competition control (Hirshman-Herfindahl index)

*X*<sub>*ijrt*</sub> - firm controls (firms size, human capital, leverage, intangible assets, TFP gap)

*Industry*<sub>*j*</sub> - industry dummies

*Region*<sub>*r*</sub> - regional dummies

*Period*<sub>*t*</sub> - time dummies

# IV Data and methodology

- $Horizontal\ Spillover_j = \frac{\sum_{k\ if\ k \neq j} Foreign\ share_i * Y_i}{\sum_{i\ for\ all\ i \in j} Y_i}$
- $Backward_j = \sum_{k\ if\ k \neq j} \alpha_{jk} * Horizontal_k$
- $Forward_j = \sum_{k\ if\ k \neq j} \alpha_{kj} * Horizontal_k$

$i$  - firm,  $j$ -industry

$Foreign\ share_i$  - takes value 0-1

$Y_i$  - employment

$\alpha_{jk}$  – the proportion of sector  $j$ 's output supplied to sector  $k$

$\alpha_{kj}$  - proportion of inputs of industry  $j$  purchased from industry  $k$ .

# V Results – baseline model

$$TFP_{ijrt} = TFP_{ijrt-1} + \alpha_1 horizontal_{jt} + \alpha_2 backward_{jt} + \alpha_3 forward_{jt} + \beta HH_{jt} + \gamma X_{ijrt} + Industry_j + Region_r + Period_t + \varepsilon_{ijrt}$$

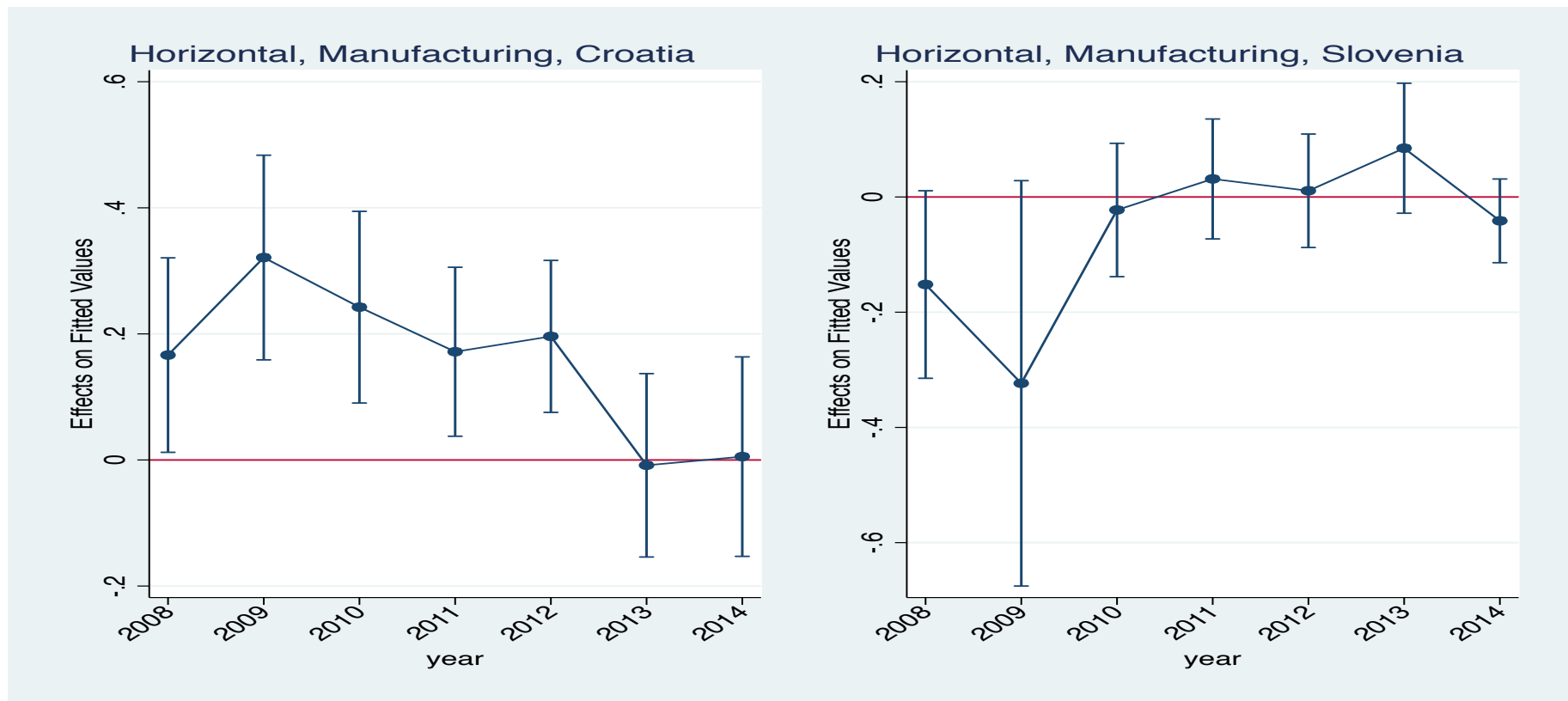
	MANUFACTURING		SERVICE	
	CROATIA	SLOVENIA	CROATIA	SLOVENIA
<b>TFP</b>				
L.TFP	0.41*** (0.036)	0.71*** (0.040)	0.93*** (0.200)	0.589*** (0.0497)
L2.TFP	0.15*** (0.023)	0.060* (0.033)	0.006 (0.170)	
<b>Horizontal spillover</b>	<b>0.15***</b> (0.049)	<b>-0.034</b> (0.032)	<b>-0.091***</b> (0.035)	<b>-0.131***</b> (0.041)
<b>Backward spillover</b>	<b>-0.47*</b> (0.243)	<b>0.395***</b> (0.117)	<b>-1.072**</b> (0.462)	<b>1.370***</b> (0.354)
<b>Forward spillover</b>	<b>-0.55</b> (0.364)	<b>0.050</b> (0.147)	<b>1.586**</b> (0.673)	<b>1.064***</b> (0.253)
Number of firms	2226	1548	3799	2170
Sargan-Hansen test (p-value)	0.787	0.562	0.216	0.395
1 <sup>st</sup> order autocorrelation (p-value)	0.00	0.00	0.00	0.00
2 <sup>nd</sup> order autocorrelation (p-value)	0.840	0.149	0.463	0.737

\* 10% significance, \*\* 5% significance; \*\*\*1% significance



# V Results – interactions, manufacturing

**Interactions:** horizontal spillovers # year dummies

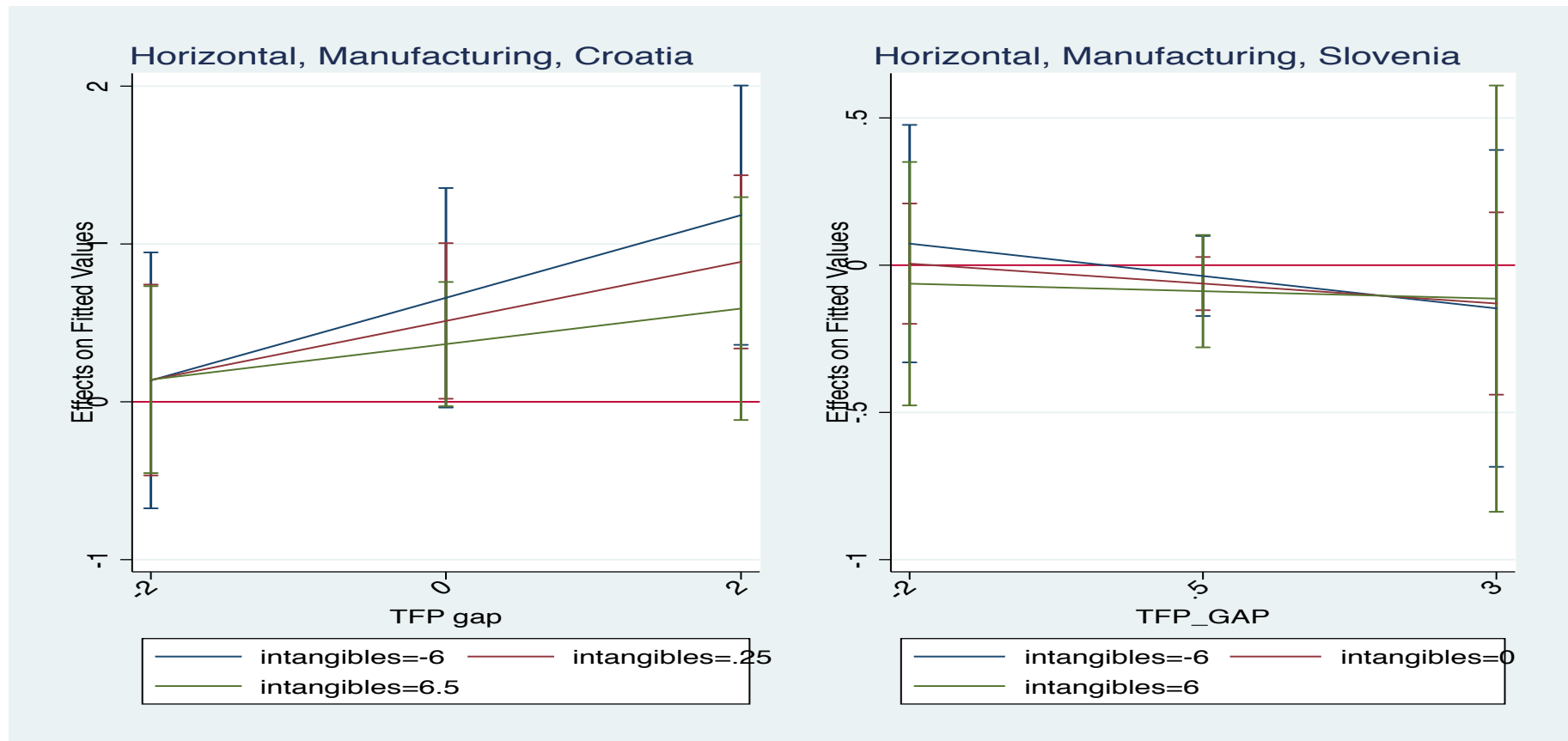


The positive effects start diminishing after the crisis

Horizontal spillovers in Slovenia insignificant throughout the period

# V Results – interactions, manufacturing

**Interactions:** horizontal spillovers # TFP gap # intangible assets

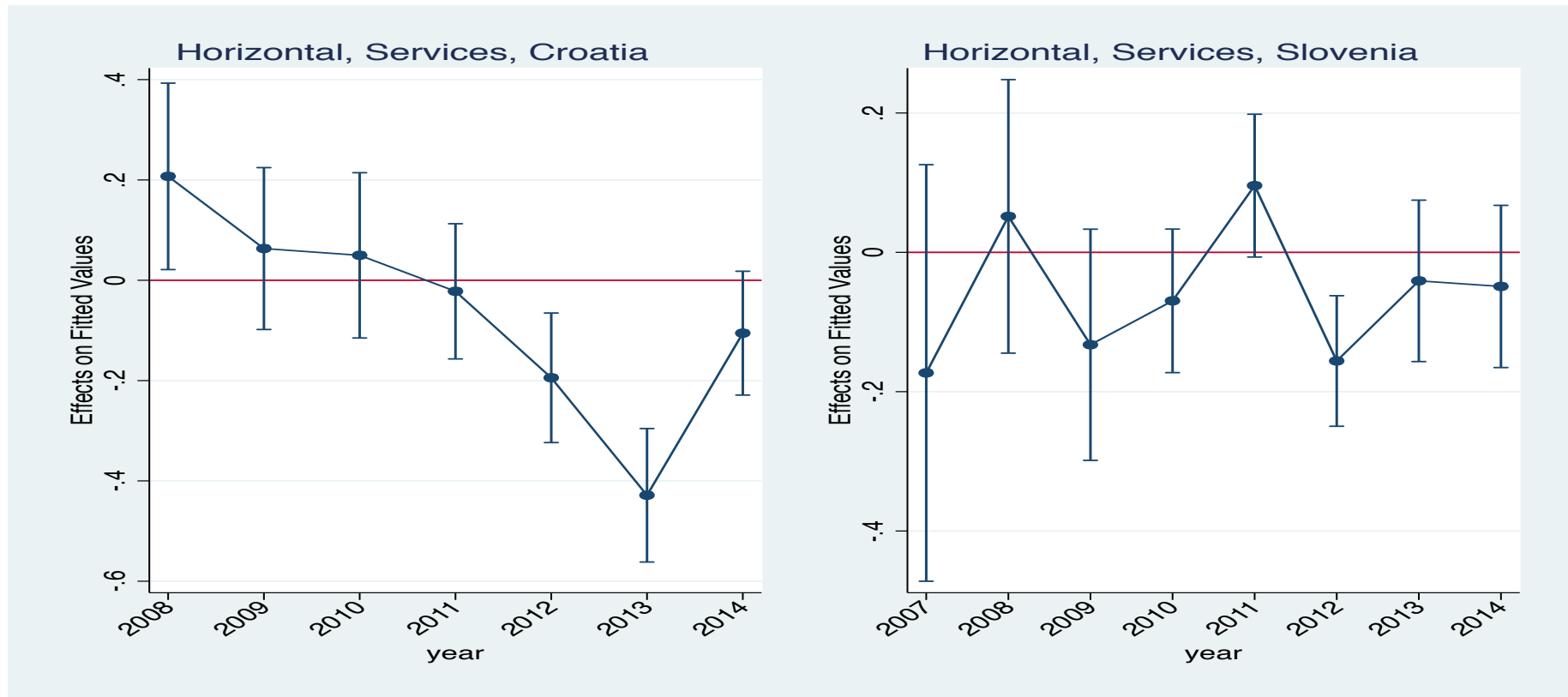


Findlay (1978) theory of relative backwardness – support found only in Croatia

The effects are insignificant in Slovenia regardless of firm technological advancement and level of absorptive capacity

# V Results – interactions, services

**Interactions:** horizontal spillovers # year dummies

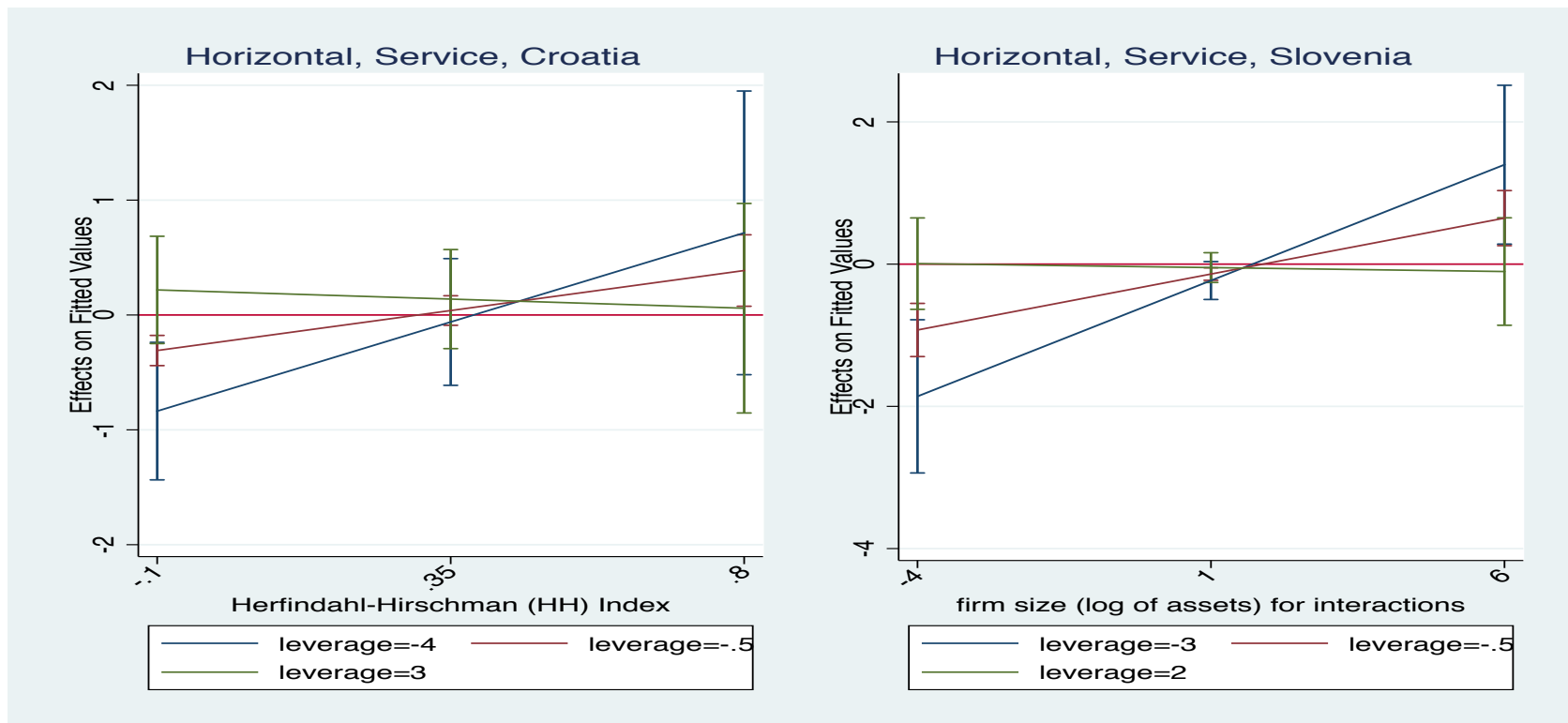


Croatia: effects were positive before the crisis. They diminish and become negative after the crisis

Slovenia: negative effects driven by 2012 (GDP growth rate in -2.7%)

# V Results: interactions, services

**Interactions:** horizontal spillovers # leverage # industry competition (Croatia)  
horizontal spillovers # leverage # firms size (Slovenia)



Negative effects are driven by firms with low leverage. After the financial crisis banks had restrictive credit policies.

# VI Conclusion

- **FDI horizontal spillovers in manufacturing** are country specific and only positive in Croatia, mainly due to greater scope for knowledge absorption (TFP gap).
- **FDI horizontal spillovers in services are negative** in both countries confirming the theoretical predictions. FDI horizontal spillovers in services are affected by lack of external sources of finance, which operate via different mechanisms in two countries – firms size in Slovenia and competition in Croatia.
- **FDI spillovers are affected by the financial crisis.**
- **Forward spillover** effects are sector specific, while **backward spillover** effects are country specific.

Questions?

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